

# APPENDIX B

## Proposed Basin Plan Amendment

### ***REVISED TEXT TO SUPPLEMENT APPENDIX A OF THE OCTOBER 19, 2005, WATER BOARD AGENDA PACKAGE***

#### **2005 Basin Plan General Update With Non-regulatory Revisions**

This document contains proposed changes to the Basin Plan amendment text that was originally presented to the Water Board at the October 19, 2005, public hearing. The draft proposed Basin Plan amendment was made available to the public on August 12, 2005. Additional text changes were made to the proposed Basin Plan amendment in response to comments received from the public by September 26, 2005, and staff-initiated changes. Water Board staff met with State Water Board staff on October 28, 2005, to discuss the proposed amendment, and the following additional changes are proposed. The chronology of proposed revisions to the 1995 Basin Plan is shown below:

1. Text from the 1995 Basin Plan is shown without any markings.
2. New text proposed to be inserted into the 1995 Basin Plan as presented to the public on August 12, 2005, is shown in underline.
3. Text proposed to be deleted from the 1995 Basin Plan as presented to the public on August 12, 2005, is shown in ~~strikeout~~.
4. Text proposed to be inserted into the 1995 Basin Plan in response to public comments received by September 26, 2005, is shown in *italics and underline*.
5. Text previously proposed to be deleted from the 1995 Basin Plan as presented to the public on August 12, 2005, but was reinserted in response to public comments received by September 26, 2005, is shown in plain type and double underline.
6. Text proposed to be deleted from the 1995 Basin Plan or inserted in response to recommendations from the State Water Board is shown in ~~underline and strikeout~~ or in plain text and is contained in a box.

## **CHAPTER 3 WATER QUALITY OBJECTIVES**

### **3.1 WATER QUALITY OBJECTIVES**

### **3.2 OBJECTIVES FOR OCEAN WATERS**

### **3.3 OBJECTIVES FOR SURFACE WATERS**

#### **3.3.1 BACTERIA**

#### **3.3.2 BIOACCUMULATION**

#### **3.3.3 BIOSTIMULATORY SUBSTANCES**

#### **3.3.4 COLOR**

#### **3.3.5 DISSOLVED OXYGEN**

#### **3.3.6 FLOATING MATERIAL**

#### **3.3.7 OIL AND GREASE**

#### **3.3.8 POPULATION AND COMMUNITY ECOLOGY**

#### **3.3.9 pH**

#### **3.3.10 RADIOACTIVITY**

Radionuclides shall not be present in concentrations 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. Waters designated for use as domestic or municipal supply shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations (CCR), which is incorporated by reference into this Plan. This incorporation is prospective, including future changes to the incorporated provisions as the changes take effect (see **Table 3-5**).

- 3.3.11 SALINITY**
- 3.3.12 SEDIMENT**
- 3.3.13 SETTLEABLE MATERIAL**
- 3.3.14 SUSPENDED MATERIAL**
- 3.3.15 SULFIDE**
- 3.3.16 TASTES AND ODORS**
- 3.3.17 TEMPERATURE**
- 3.3.18 TOXICITY**
- 3.3.19 TURBIDITY**
- 3.3.20 UN-IONIZED AMMONIA**
- 3.3.21 OBJECTIVES FOR SPECIFIC CHEMICAL CONSTITUENTS**
- 3.3.22 CONSTITUENTS OF CONCERN FOR MUNICIPAL AND AGRICULTURAL WATER SUPPLIES**

At a minimum, surface waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of constituents in excess of the maximum (MCLs) or secondary maximum contaminant levels (SMCLs) 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) of Section 64431, and 64431-B Table 64433.2-A (Fluoride) of Section 64431 64433.2, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-A (SMCLs-Consumer Acceptance Limits) and 64449-B (SMCLs-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. **Table 3-5** contains water quality objectives for municipal supply, including the MCLs contained in various sections of Title 22 as of the adoption of this plan.

### **3.4 OBJECTIVES FOR ~~GROUNDWATERS~~GROUNDWATER**

Groundwater objectives consist primarily of narrative objectives combined with a limited number of numerical objectives. Additionally, the ~~Regional Board~~Water Board will establish basin- and/or site-specific numerical groundwater objectives as necessary. For example, the Regional Water Board has groundwater basin-specific objectives for the Alameda Creek watershed above Niles to include the Livermore-Amador Valley as shown in Table 3-7.

*The maintenance of existing high quality of groundwater (i.e., “background”) is the primary groundwater objective.*

In addition, at a minimum, ~~groundwaters~~groundwater shall not contain concentrations of bacteria, chemical constituents, radioactivity, or substances producing taste and odor in

excess of the objectives described below unless naturally occurring background concentrations are greater. ~~For groundwater that discharges migrates into surface water, groundwater must comply with surface water quality objectives for the water body receiving the groundwater discharge.~~ Under existing law, the Water Board regulates waste discharges to land that could affect water quality, including both groundwater and surface water quality. Waste discharges that reach groundwater are regulated to protect both groundwater and any surface water in continuity with groundwater. Waste discharges that affect groundwater that is in continuity with surface water cannot cause violations of any applicable surface water standards. ~~There exists a surface water quality objective that prohibits surface waters from containing concentrations of chemical constituents in amounts that adversely affect any designated beneficial use, which is relevant where groundwater discharges to surface water.~~

### 3.4.1 BACTERIA

In ~~groundwaters~~ groundwater with a beneficial use of municipal and domestic supply, the median of the most probable number of coliform organisms over any seven-day period shall be less than 1.1 most probable number per 100 milliliters (MPN/100 mL) (based on multiple tube fermentation technique; equivalent test results based on other analytical techniques as specified in the **National Primary Drinking Water Regulation, 40 CFR, Part 141.21 (f)**, revised June 10, 1992, are acceptable).

### 3.4.2 ORGANIC AND INORGANIC CHEMICAL CONSTITUENTS

All ~~groundwaters~~ groundwater shall be maintained free of organic and inorganic chemical constituents in concentrations that adversely affect beneficial uses. ~~or pose adverse risk to human health and the environment.~~ ~~All groundwater that discharges to surface water regardless of the beneficial use designation for that groundwater shall not contain concentrations of chemicals in amounts that will adversely affect the beneficial use of the receiving surface water.~~ To evaluate compliance with water quality objectives, the ~~Regional Board~~ Water Board will consider all relevant and scientifically valid evidence, including relevant and scientifically valid numerical criteria and guidelines developed and/or published by other agencies and organizations (e.g., U.S. **Environmental Protection Agency (U.S. EPA)**, State Water ~~Resources Control~~ Board, California **Department of Health Services (DHS)**, U.S. Food and Drug Administration, National Academy of Sciences, **California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA)**, U.S. Agency for Toxic Substances and Disease Registry, Cal/EPA's **Department of Toxic Substances Control (DTSC)**, and other appropriate organizations.)

At a minimum, ~~groundwaters~~groundwater designated for use as domestic or municipal supply (MUN) shall not contain concentrations of constituents in excess of the maximum (MCLs) or secondary maximum contaminant levels (SMCLs) 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) of Section 64431, ~~and 64431-B Table 64433.2-A (Fluoride) of Section 64431 64433.2,~~ and Table 64444-A (Organic Chemicals) of Section 64444. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect (See **Table 3-5**).

~~Groundwaters~~Groundwater with a beneficial use of agricultural supply shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use. In determining compliance with this objective, the ~~Regional Board~~Water Board will consider as evidence relevant and scientifically valid water quality goals from sources such as the Food and Agricultural Organizations of the United Nations; University of California Cooperative Extension, Committee of Experts; and McKee and Wolf's "Water Quality Criteria," as well as other relevant and scientifically valid evidence. At a minimum, ~~groundwaters~~groundwater designated for use as agricultural supply (AGR) shall not contain concentrations of constituents in excess of the levels specified in **Table 3-6**.

~~Groundwaters~~Groundwater with a beneficial use of freshwater replenishment shall not contain concentrations of chemicals in amounts that will adversely affect the beneficial use of the receiving surface water.

~~Groundwaters~~Groundwater with a beneficial use of industrial service supply or industrial process supply shall not contain pollutant levels that impair current or potential industrial uses.

~~To assist dischargers and other interested parties, the Central Valley Regional Board's staff has compiled many numerical water quality criteria from other appropriate agencies and organizations in its staff report, "A Compilation of Water Quality Goals." This staff report is updated regularly to reflect changes in these numerical criteria.~~

### 3.4.3 RADIOACTIVITY

At a minimum, ~~groundwaters~~groundwater 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 (Radioactivity) of Section 64443 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 (See **Table 3-5**).

### 3.4.4 TASTE AND ODOR

~~Groundwaters~~Groundwater designated for use as domestic or municipal supply (MUN) shall not contain taste- or odor-producing substances in concentrations that cause a nuisance or adversely affect beneficial uses. At a minimum, ~~groundwaters~~groundwater designated for use as domestic or municipal supply shall not contain concentrations in excess of the ~~secondary maximum contaminant levels (Secondary SMCLs)~~ specified in Tables 64449-A (Secondary MCLs-Consumer Acceptance Limits) and 64449-B (Secondary MCLs-Ranges) of Section 64449 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 (See **Table 3-5**). ~~For groundwater that discharges to surface water, groundwater must comply with surface water quality objectives for the water body receiving the groundwater discharge, including taste and odor producing substances, such as xylenes and methyl tert butyl ether (MtBE).~~

### 3.5 OBJECTIVES FOR THE DELTA ~~AND SUISUN MARSH~~

The objectives contained in the State Water Board's 1995 "Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Suisun Marsh" and any revisions thereto shall apply to the waters of the Sacramento-San Joaquin Delta ~~and adjacent waters as specified in that plan and Suisun Marsh.~~

### 3.6 OBJECTIVES FOR ALAMEDA CREEK WATERSHED

The water quality objectives contained in **Table 3-7** apply to the surface and groundwaters of the Alameda Creek watershed above Niles.

Wastewater discharges that cause the surface water limits in **Table 3-7** to be exceeded may be allowed if they are part of an overall water-wastewater resource operational program developed by those agencies affected and approved by the Regional Water Board.

- ~~–Minimize the current trend toward increasing main basin groundwater salinity due to subsurface groundwater inflow, natural recharge;~~
- ~~–Ensure that water imports and water recycling will not contribute to the degradation of groundwater quality; and~~
- ~~–Protect groundwater beneficial uses.~~

~~The Salt Management Plan will also provide a technical basis for estimating and allocating salt loading or removal among existing sources and new projects. Accordingly, the SMP includes development of a basin-wide model of salt sources and sinks. Numerical factors, representing (for example) connectivity between groundwater basins and effects of filtering through the soil mantle, will be estimated using the preparer's best professional judgement. The SMP will also provide information needed to support the DHS engineering report for full-scale groundwater recharge projects.~~

~~Groundwater recharge or conveyance via ephemeral streams or waters of the state is an essential component of the proposed valley-wide, year-round water recycling and groundwater quality management program. Projects subject to NPDES requirements are not authorized under the master water reuse permit. The permit solely identifies the technical reports necessary to support a future NPDES permit application. The Regional Board will consider issuing a separate NPDES permit to the permittees following receipt of a complete NPDES application.~~

#### 4.11.4.4. GENERAL WATER REUSE PERMIT

The City of Livermore and DSRSD were approved for the General Water Reuse Requirements for Municipal Wastewater and Water Agencies, (**General Water Reuse Permit**) (see **Section 4.16 Water Recycling**), to administer their current and future recycled water projects involving landscape and/or agricultural irrigation recycling water projects. The General Water Reuse Permit, which delegates the administration of domestic wastewater reuse to water recycling agencies and water agencies, replaces the Master Permit for surface irrigation projects. The General Water Reuse Permit issued to the City of Livermore and DSRSD incorporates the requirements of the approved SMP. The Master Permit will remain on record, and, if needed, will be revised to address any future groundwater recharge projects that may be planned by the two agencies.

Groundwater recharge or conveyance via ephemeral streams (*i.e., water of the state*) is an essential component of the proposed Valley-wide, year-round water recycling and groundwater quality management program. However, projects subject to NPDES requirements are not authorized under the Master Permit. The Master Permit identifies the technical reports necessary to support a future NPDES permit application. The Water Board will consider issuing a separate NPDES permit to the permittees following receipt of a complete NPDES application.

transportation to the place of use; and its actual use. Per Water Code Section 13050, recycled water means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource. To date in ~~theis region~~Region, disposal of most municipal and industrial wastewater has primarily involved discharges into the ~~#Region's~~Region's watersheds and the ~~San Francisco e~~San Francisco Bay ~~Estuary-system~~Estuary system. With growing awareness of the impacts of toxic discharges, ~~the~~the drought, future urbanization, and growth on the local aquatic habitat, there is an increasing need to look for other sources of water. Increasingly, conservation and water recycling (formerly referred to as reclamation) will be needed to deal with these long-term water issues. The ~~Regional Board~~Water Board recognizes that people of the ~~San Francisco Bay~~San Francisco Bay ~~Region~~Region are interested in developing the capacity to conserve and recycle reclaim water to supplement existing water supplies, meet future water requirements, and restore the ~~R~~Region's watersheds and ~~E~~Estuary ~~system~~system. Disposal of wastewater to inland, estuarine or coastal waters is not considered a permanent solution where the potential exists for conservation, water recycling, and reuse and reclamation.

The Constitution of California, Article X, declares that, “...because of the conditions prevailing in the state, the general welfare requires that the water resources of the state be put to beneficial use to the fullest extent to which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof ~~is~~ in the interest of the people and for the public welfare.” In other words, when suitable recycled water is available, it should be used to supplement existing water supplies used for agricultural, industrial, municipal, and environmental purposes.

The Water Board also recognizes and supports the concept that water reuse is an essential component for planning future water supply, especially in areas dependent on imported water. This includes projects that use recycled water to increase the local water supply, to improve the salt balance in the groundwater basin, or to reduce the need for wastewater export through recycled water irrigation and groundwater recharge with imported water or with high-quality recycled water. The year-round, dependable recycled water resource may also be appropriate for stream flow augmentation to enhance beneficial uses of streams.

State Water Board Resolution 77-1, adopted in 1977, requires the State and Regional Water Boards to encourage water recycling projects for beneficial use using wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds. The resolution also specifies using recycled water to replace or supplement the use of fresh water or better quality water, and to preserve, restore, or enhance in-stream beneficial uses, including fish, wildlife, recreation and aesthetics associated with any surface water or wetlands.

California Water Code, Section 275, states that the Regional Board shall take all appropriate proceedings or actions to prevent waste, unreasonable use, or unreasonable method of use. In section 13550, the Legislature defines the use of potable domestic

~~billed for engineering and construction costs, and ultimate payment assured by a lien on the property. A service district such as this has been used with success in Stinson Beach and would be one means of implementing this regulatory system, but the county could probably acquire the necessary powers directly.~~

~~The Water Board may authorize local agencies may to approve and permit certain types of alternative on-site systems, provided the local regulatory program is found to be acceptable and in accordance with the Water Board's position on alternative systems discussed above. The Regional Board will consider the local agency's alternative system program, in accordance with the Regional Board's position on alternative systems discussed above. An acceptable program should include a) siting and design criteria for the types of alternative systems being approved, b) procedures for on-going inspection, monitoring, and evaluation of these systems, and c) appropriate local regulations for implementation and enforcement of the program. Such a authorization may be granted through a conditional waiver adopted by the Water Board and will typically include a Memorandum of Understanding (MOU) between the Regional Board Water Board and the local agency. Typically, that agency will be the county environmental health department. The MOU provides a means for identifying the responsibilities of both the Regional Board Water Board and the local agency, applicable criteria for such as mutually agreed siting, design, and construction, criteria, and guidelines for the operation, maintenance, and monitoring, and procedures for implementing the program of alternative systems.~~

~~Alternative onsite system designs proposed for approval in a local agency program should must be substantiated by suitable reference materials demonstrating successful performance under site and soil conditions similar to the local conditions, including previous field or research facility testing and documentation of applicable design, installation and use criteria. System designs that have not been fully proven under proposed conditions will be considered experimental and treated with caution. In general, experimental systems will require more careful siting and design review and, if approved, intensive monitoring and inspection to ensure adequate system operation and performance. Experimental systems are generally will be approved only for limited use, until successful performance has been demonstrated and documented, and acceptable design, installation and use criteria determined.~~

~~Alternative on-site system designs should be substantiated by suitable reference materials including previous field testing and documentation of successful performance under site and soil conditions similar to the local conditions. System designs that have not been fully proven under proposed conditions will be considered experimental and treated with caution. In general, experimental systems will require more careful siting and design review and, if approved, intensive monitoring and inspection to ensure adequate system operation and performance.~~

#### 4.18.4. GRAYWATER DISPOSAL SYSTEMS

Numerical limits that implement all applicable water quality objectives, ~~including include~~ Maximum Contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs), ~~and are intended~~ are only acceptable as the upper end of a concentration range to protect the beneficial uses of municipal and domestic drinking water sources. ~~Such numerical limits are appropriate only at the upper end as some are set after technical feasibility and treatment costs are considered, leave no margin for future spills, and do not account for the combined risks that exist when many chemicals are present.~~

Ideally, the ~~Regional Board~~ Water Board would establish numerical groundwater objectives for all constituents. However, the ~~Regional Board~~ Water Board is limited in its ability and resources to independently establish numerical objectives for groundwater. To evaluate compliance with water quality objectives, the ~~Regional Board~~ Water Board will ~~consider~~ consider all relevant and scientifically valid evidence, including relevant and scientifically valid numerical criteria and guidelines developed and/or published by other ~~agencies~~ agencies and organizations (e.g., State Water Board, U.S. EPA, ~~DHS California Department of Health Services~~, Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA), Cal/EPA's Department of Toxic Substances Control (DTSC), etc.) to provide the numerical criteria for ~~Regional Board~~ Water Board consideration as groundwater objectives.

~~To assist dischargers and other interested parties, Water Board staff developed environmental screening levels (ESLs) for over 100 commonly encountered chemicals in the environment. The ESLs are compiled in "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater". This report is updated regularly to reflect changes in the numerical data.~~

~~California Human Health Screening Levels (CHHSLs) were developed by OEHHA for 54 commonly encountered hazardous substances in its report titled, "Use of California Human Health Screening Levels in Evaluation of Contaminated Properties." The CHHSLs address direct exposure to soil and potential vapor intrusion into buildings. As discussed in the guidance document, the CHHSLs do not address all potential environmental concerns that may be present at sites where contaminated soil and groundwater are identified. Evaluation of additional concerns (e.g., protection of water resources or wildlife) must be carried out separately. The Water Board report offers one approach to accomplish this.~~

~~Screening levels are intended to be protective in a wide range of conditions. Screening levels are advisory numbers and have no regulatory effect.~~

~~The Central Valley Water Board summarized water quality standards and criteria from a variety of sources in "A Compilation of Water Quality Goals". This report contains an extensive compendium of numerical water quality limits from the literature for over 800 chemical constituents and water quality parameters. These limits may be used to determine whether beneficial uses of groundwater and surface water are impaired or threatened. The text of the report explains, with examples, how these limits may be used~~

~~to interpret water quality standards in California. This in turn may help determine appropriate site-specific cleanup standards to protect water quality. A summary of relevant statutes, regulations, plans, and policies and a list of references are included.~~

~~he Central Valley Regional Water Board's staff compiled many numerical water quality criteria from other appropriate agencies and organizations in its staff report, "A Compilation of Water Quality Goals." This staff report is updated regularly to reflect changes in these numerical criteria.~~

In practice, the ~~Regional Board~~Water Board uses water quality objectives for groundwater somewhat differently from those for surface water. For groundwater, the ~~Regional Board~~Water Board's emphasis is the regulation of sites where water quality objectives are not being ~~met,met~~; cleanup is required and/or under way, and no further waste discharges will be allowed in the future. In contrast, surface water discharges regulated by the ~~Regional Board~~Water Board are usually for ongoing discharges regulated to meet water quality objectives in receiving waters.

In ~~the~~a typical situation, the ~~Regional Board~~Water Board must identify and establish site- and basin-specific groundwater beneficial uses and standards for the cleanup of groundwater polluted by ~~the~~ numerous and extensive spills and leaks of toxic chemicals (e.g., organic solvents, fuels, metals, etc.).

Very few waste discharges to land are allowed by the ~~Regional Board~~Water Board and those that are permitted (e.g., landfills, industrial waste disposal, above-ground soil treatment, etc.) are closely regulated under the requirements of existing laws and regulations in order to maintain and protect groundwater quality objectives. An additional category of discharges to land is the numerous individual domestic waste disposal systems (e.g., onsite dispersal septic systems) that are permitted and regulated by the counties. The ~~Regional Board~~Water Board waives regulation based upon the fact that the counties' regulation of the systems complies with applicable ~~Regional Board~~Water Board requirements.

Groundwater objectives for individual basins may be developed in the future. As the ~~Regional Board~~Water Board completes projects that provide more detailed delineation of beneficial uses within basins, revised objectives may be developed for portions of groundwater basins that have unique protection needs. Examples of Water Board projects completed in the Region are ~~One such project is~~ described in below under Section 4.25.5 **Groundwater Protection Studies.**

However, in cases where unauthorized releases have polluted groundwater, restoring groundwater quality to background concentrations is often technically impractical. In those situations, groundwater should be restored to attain applicable beneficial uses.

### SOURCES OF DRINKING WATER POLICY

This policy, adopted by the State Water Board in 1988 (**Resolution No. 88-63**), assigns Municipal and Domestic Supply (MUN) beneficial use designations to all waters of the state with certain exceptions. A water body that serves municipal or domestic use cannot have that designation removed. This policy, adopted by the State Water Board in 1988 (Resolution No. 88-63), established state policy that all surface and ground water in the state are considered suitable, or potentially suitable, for municipal or domestic supply (MUN) and should be designated for this use, with certain exceptions. The exceptions for groundwater are:

- The groundwater's TDS exceeds 3,000 mg/L (5,000 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ), electrical conductivity), and it is not reasonably expected by the Water Boards to supply a public water system; or
- There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use through implementation of BMPs 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 Code of Federal Regulations (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**.

### POLICIES AND PROCEDURES FOR INVESTIGATION AND CLEANUP AND ABATEMENT OF DISCHARGES

The ~~State Board~~ ~~adopted~~ ~~State Water Board~~ Resolution No. 92-49, "**Policies and Procedures for Investigation, Cleanup and Abatement of Discharges Under Water Code Section 13304**" ~~This resolution~~ contains the policies and procedures that all Regional Water Boards shall follow to oversee and regulate investigations and cleanup and abatement activities resulting from all types of discharge or threat of discharge subject to **Water Code Section 13304** ~~of the Water Code~~. Therefore, the five program areas described below ~~listed above~~ (i.e., UST, SLIC, UST, Landfills, DoD/DoE,

2. Soil and water investigation to determine the source, nature, and extent of the discharge with sufficient detail to provide the basis for decisions regarding subsequent cleanup and abatement actions, if any are determined by the Regional Water Board to be necessary;
3. Proposal and selection of cleanup action to evaluate feasible and effective cleanup and abatement actions and to develop preferred cleanup and abatement alternatives;
4. Implementation of cleanup and abatement action to implement the selected alternative and to monitor in order to verify progress; and
5. Monitoring to confirm short- and long-term effectiveness of cleanup and abatement.

These elements are described below. The site conditions will determine what elements may be needed based on the complexity of the site and the scope of the work needed.

Site Assessment and Conceptual Site Model — A site assessment should be conducted at the beginning of the oversight process, in order to identify the full range of contamination issues and potential impacts associated with each. At a minimum, current and past operations at the site should be evaluated that are equivalent to the requirements of an **American Society of Testing Materials (ASTM) Phase 1** investigation. A preliminary conceptual site model (CSM) should be developed that describes the potential source and distribution of contaminants at the site and the environmental pathways and potential current and future receptors. The CSM should be updated as additional data become available.

Remediation Investigation — The remedial investigation **should** consist of a complete on- and off-site investigation of soil and groundwater to determine the full horizontal and vertical extent of pollution and is necessary to ensure that adequate cleanup plans are proposed. The scope of the remedial investigation is dependent on the CSM that should be updated as additional data become available.

Risk Assessment — An environmental and human health risk assessment should be conducted to define the potential risk to human health and ecological receptors and to identify other potential environmental concerns such as leaching, nuisances, and gross contamination. The level of effort required will depend on the site conditions. At simple sites, the use of environmental screening levels may be adequate (**Section 4.25.2.3 Setting Cleanup Levels**). At more complex sites, site-specific risk assessments may be required.

Establish Cleanup Requirements — Cleanup requirements should be proposed that protect human health, water quality, and the environment. Soil and groundwater cleanup levels should be established at or below the level necessary to protect human health, applicable beneficial uses of water (existing or potential) and protect aquatic and terrestrial habitats.

as well as address potential nuisance and gross contamination (Section 4.25.2.3 Setting Cleanup Levels).

Feasibility Study—The feasibility study should consist of an analysis of remedial alternatives for site cleanup. At simple sites, presumptive remedies may be acceptable. At more complex sites, remedial alternatives should be evaluated using the nine criteria in the U.S. EPA’s Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations. Per Water Code Section 13360, the Water Board cannot specify the means of compliance.

Interim Remedial Measures and Source Removal—Interim remedial measures may be conducted prior to development and approval of a final remedial action plan when such measures are (a) conducted to control the source of contamination, such as free product removal; or (b) needed to prevent continued migration of or exposure to contaminants.

Site Cleanup—Site cleanup will typically consist of removal of the source of pollution, to the extent practicable, to prevent further spread of pollution, followed by groundwater cleanup. Pump and treat groundwater remediation, in some instances, is effective in hydraulically containing pollution and removing pollutants. Vacuum extraction of pollutants in the vadose zone can be a cost-effective method to remove pollution sources. Bioremediation of petroleum and VOC pollution can be a cost-effective soil and groundwater treatment alternative.

The following additional requirements for site cleanup and closure may also apply, as described below.

“Cleanup Complete” Determinations – The Water Board provides no further action (NFA) confirmations and no-further-active-cleanup confirmations to responsible parties when no further active cleanup is needed. For petroleum-impacted sites, the Water Board provides a case closure letter as part of the case closure summary report.

Public Participation – The Water Board will provide opportunities for public participation in the oversight process so that the public is informed and has the opportunity to comment. The level of effort is tailored to site-specific conditions, depending on site complexity and public interest. The level of public participation effort at a particular site is based on the potential threat to human health, water quality, and the environment; the degree of public concern or interest in site cleanup; and any environmental justice factors associated with the site.

Electronic Data Reporting – The State Water Board maintains a web-based geographic information system (GIS) program that provides the public and regulators with online access to environmental data. The State Water Board adopted regulations that require electronic submittal of information for groundwater cleanup programs (Title 23, CCR, Division 3, Chapter 30). For several years, parties responsible for cleanup of leaking underground fuel tanks (LUFT) have been required to submit groundwater analytical data, the surveyed locations of monitoring wells, and certain other data to the State

Water Board database over the Internet. As of 2005, all groundwater cleanup programs are required to submit these items as well as a portable data format (PDF) copy of reports.

Compliance Monitoring – Monitoring reports are required periodically that describe the status of the cleanup activities and monitoring results. The Water Board will conduct site inspections to ensure the responsible party is complying with Water Board enforcement directives.

Risk Management – Risk management may be required at sites where (1) residual soil contamination is left in place or (2) groundwater contamination is present but is naturally attenuating. The Water Board encourages the use of risk management at contamination sites as an integral part of the cleanup toolkit. Risk management measures include a range of actions intended to reduce future exposure to residual site contamination. Examples include:

- ✓ Prohibitions on domestic use of shallow groundwater
- ✓ Prohibitions on a change in land use (to a more sensitive use)
- ✓ Maintenance of an engineered cap or paving above soil residuals
- ✓ Health and safety measures to be taken during construction in contaminated soils
- ✓ Restrictions on grading or trenching to protect passive cleanup or containment systems
- ✓ Regular notification of site tenants or neighbors about residual contamination

Deed Restriction - A deed restriction (land use covenant) may be required to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials. **Water Code Section 13307.1** requires that deed restrictions be mandated for sites that are not cleaned up to “unrestricted use”, and that the restrictions be recorded and run with the land to prohibit sensitive uses such as homes, schools, or day care facilities. Underground storage tank (UST) sites are exempted from this requirement because of the sheer numbers and the small size of most of these sites. Site conditions are tracked in the statewide database developed by the State Water Board (**Section 4.25.2.2 Electronic Data Reporting**).

Liability Relief Tools – Several tools are available to municipalities, landowners, developers and responsible parties for seeking relief from contamination liability. The Polanco Act, California Land Environmental Restoration and Reuse Act, and California Land Reuse and Revitalization Act provide liability relief and help redevelopment agencies, cities and counties to guide and pursue redevelopment of Brownfield sites (**Section 4.25.3.1 Brownfields**).

- Allow residual pollutants to remain in soil at concentrations such that:
  - a) Any residual mobile constituents generated would not cause groundwater to exceed applicable groundwater quality objectives, and
  - b) Health risks from surface or subsurface exposure are within acceptable guidelines.
- Require follow-up groundwater monitoring to verify that groundwater is not polluted by chemicals remaining in the soil. Follow-up groundwater monitoring may not be required where residual soil pollutants are not expected to impact groundwater.
- Require measures to ensure that soils with residual pollutants are covered and managed to minimize pollution of surface waters and/or exposure to the public.
- Implement applicable provisions of ~~Chapter 15 CCR Title 27~~ where significant amounts of wastes remain onsite. This may include, but is not limited to, subsurface barriers, pollutant immobilization, toxicity reduction, and financial assurances.

In order for a discharger to make site-specific recommendations for soil cleanup levels above background, the fate and transport of leachate can be modeled by the discharger using site-specific factors and appropriate models. Assumptions for minimal leachate dilution, as proposed by the discharger, may be considered by the ~~Regional Board~~ Water Board if deemed reasonable.

~~Cleanup levels are approved by the Regional Board. The Executive Officer or a local agency may approve cleanup levels as established by the Regional Board. Due to the tremendous number of sites with soil pollution, the Regional Board has considered developing "generic" cleanup levels for common soil pollutants. However, given the extreme variability of hydrogeologic conditions in the Region, the Regional Board is presently unable to recommend levels that would be protective of groundwater at every site. One exception to this are cleanup standards for volatile organic chemicals (VOCs) and semi-volatile organic chemicals.~~

#### ENVIRONMENTAL SCREENING LEVELS (ESLs)

~~To assist dischargers and other interested parties, the Water Board developed, "Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater," which compiles numerical water quality criteria for protection of human health and the environment. The ESLs were developed to address environmental protection goals including the following environmental pathways (Figure 4-6):~~

~~Surface Water and Groundwater:~~

- Protection of drinking water resources
- Protection of aquatic habitats
- Protection against adverse nuisance conditions

**Soil:**

- Protection of human health
- Protection of groundwater
- Protection of terrestrial biota in urban areas
- Protection against adverse nuisance conditions

The ESLs are presented in a series of four "lookup" tables. Each table reflects a specific combination of soil, groundwater and land use characteristics that strongly influence the magnitude of environmental concerns at a given site. This allows the user to select ESLs that are most applicable to a given site.

The ESL document presents a "tiered" approach to environmental risk assessments. Under "Tier 1", sample data are directly compared to ESLs selected for the site and decisions are made regarding the need for additional site investigation, remedial action or a more detailed risk assessment. In a "Tier 2" risk assessment, a selected component(s) of the Tier 1 ESL is modified with respect to site-specific considerations. An example may be the adjustment of a screening level for direct exposure with respect to an approved, alternative target risk level. Site data are then compared to the revised screening level as well as the remaining, unmodified components of the Tier 1 ESL. This provides an intermediate but still relatively rapid and cost-effective option for preparing more site-specific risk assessments. Risk assessment models and assumptions that depart significantly from those used to develop the Tier 1 ESLs are described in a more traditional, "Tier 3" risk assessment. The Tier 1 methodology can, however, still provide a common platform to initiate a Tier 3 risk assessment and help ensure that all potentially significant environmental concerns are considered.

The ESLs are considered to be conservative, are not regulatory "cleanup standards", and should not be used to determine when impacts at a site should be reported to a regulatory agency. Use of the ESLs as cleanup levels should be evaluated in view of the overall site investigation results and the cost/benefit of performing a more site-specific risk assessment. All releases of hazardous substances to the environment should be reported to the appropriate regulatory agency in accordance with governing regulations.

Use of the "tiered" approach to environmental risk assessments is optional for both the responsible party and the Water Board. The responsible party may prefer to conduct a more rigorous risk assessment to determine cleanup levels. The Water Board may require a more rigorous risk assessment be conducted if the site conditions are not fully addressed in the screening levels.

The lookup tables are updated on a regular basis, as needed, in order to reflect changes in the referenced sources as well as lessons gained from site investigations and field observations.

Screening levels were also developed by OEHHA on behalf of Cal/EPA in its report entitled, "Use of California Human Health Screening Levels in Evaluation of Contaminated Properties." The CHHSLs are lookup tables for hazardous chemicals in soil or soil gas that Cal/EPA considers to be below thresholds of concern for risks to human health. Soil, soil gas, and indoor air ESLs and CHHSLs were developed using similar methodology. However, the CHHSLs only apply to soil and soil gas, not to groundwater. ESLs also provide soil screening levels for leaching contaminants into groundwater, toxicity to flora and fauna, and nuisance or gross contamination.

To assist dischargers and other interested parties, the Central Valley Water Board compiled many numerical water quality criteria from other appropriate agencies and organizations in its report, "A Compilation of Water Quality Goals." This report is updated regularly to reflect changes in these numerical criteria.

Several Regional Board orders, adopted primarily for Superfund sites, include cleanup standards of 1 mg/kg (ppm) for total VOCs and 10 ppm for total semi-volatiles (as defined by EPA Methods 8240 and 8270, respectively, of the U.S. EPA Testing Methods for Evaluating Solid Waste, SW-846, 1986, which is incorporated by reference to this plan). These standards apply to unsaturated soils only and are based on the modeling results at a Superfund site in the Region and the professional judgement of Regional Board staff. As these are cleanup standards for total VOCs and total semi-VOCs, levels for individual constituents at polluted sites commonly are significantly lower than 1 ppm and 10 ppm, respectively. In particular, some constituents of concern have water quality standards less than 5 ppb (e.g., benzene, vinyl chloride, ethylene dibromide). Individual cleanup levels well below the 1 ppm VOC and 10 ppm semi-volatile standards may be established for these constituents.

At this time the Regional Board finds that these are appropriate cleanup levels for total VOCs and total semi-VOCs in the unsaturated zone at sites where groundwater is being monitored and where cleanup to background is unreasonable. At sites where it is determined that the 1 ppm cleanup total VOC and 10 ppm total semi-VOC may be inappropriate, the Executive Officer may modify these cleanup levels to whatever level is considered adequately protective of water quality, human health, and the environment.

A common misconception is that the Regional Board has developed "generic" cleanup levels for petroleum hydrocarbons (gasoline, gasoline byproducts, and diesel). One source of the misconception is a misreading of Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, written by the staff of the North Coast, Central Valley, and San Francisco Bay Regional Boards. This document is commonly referred to as the Tri-Regional Guidelines. The Guidelines use 100 ppm Total Petroleum Hydrocarbons in soil as one screening tool for prioritization. The 100 ppm level is not a "generic" cleanup level.

This policy adopted in 1988 implements a pilot program to fund oversight of remedial actions at leaking underground storage tank sites, in cooperation with the Department of Health Services.

### **SOURCES OF DRINKING WATER POLICY – RESOLUTION NO. 88-63**

This policy, adopted by the State Water Board in 1988 (Resolution No. 88-63) and incorporated into the Basin Plan in 1989 (Water Board Order No. 89-039), established state policy that all surface and groundwater in the state are considered suitable, or potentially suitable, for municipal or domestic supply (MUN) and should be designated for this use, with certain exceptions. assigns Municipal and Domestic Supply designations to all waters of the State with certain exceptions. A water body that serves municipal or domestic use cannot have that designation removed.

### **NONPOINT SOURCE MANAGEMENT PLAN – RESOLUTION NO. 88-123**

The “Nonpoint Source Management Plan” adopted in 1988 outlines the objectives and framework for implementing source control programs, with an emphasis on voluntary Best Management Practices and cooperation with local governments and other agencies.

### **RESOURCE VALUE OF TREATED GROUNDWATER – RESOLUTION NO. 89-21**

The State Water Board, in approving the RegionalWater Board’s guidelines for the disposal of extracted groundwater from groundwater cleanup projects, urges the RegionalWater Board to recognize the resource value of treated groundwater and to maximize its utilization for the highest beneficial uses for which applicable water quality standards can be achieved.

### **OCEAN PLAN – RESOLUTION NO. 90-27**

The “Water Quality Control Plan for Ocean Waters of California” (Ocean Plan) adopted in 1990 establishes beneficial uses and water quality objectives for waters of the Pacific Ocean adjacent to the California coast outside of enclosed bays, estuaries, and coastal lagoons. The Ocean Plan prescribes effluent quality requirements and management principles for waste discharge and specifies certain waste discharge prohibitions.

### **POLLUTANT POLICY FOR SAN FRANCISCO BAY AND THE DELTA – RESOLUTION NO. 90-67**

In 1990, the State Water Board adopted the “Pollutant Policy Document,” which identifies and characterizes the pollutants of greatest concern in the Bay-Delta Estuary. This policy requires implementation of a mass emission strategy; a monitoring and assessment program; and strategies for discharges from boat yards, drydock facilities, and dredge disposal practices. In