Final

Functional Equivalent Document

Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup Plans

June 1998

Division of Water Quality

STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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STATE WATER RESOURCES CONTROL BOARD

FINAL FUNCTIONAL EQUIVALENT DOCUMENT

WATER QUALITY CONTROL POLICY FOR GUIDANCE ON THE DEVELOPMENT OF REGIONAL TOXIC HOT SPOT CLEANUP PLANS

JUNE 1998

This is a draft document that is subject to revision.

The State Water Resources Control Board resolution approving this Functional Equivalent Document will be placed here.

PREFACE

The State Water Resources Control Board (SWRCB) is required by the California Water Code to develop a Statewide consolidated toxic hot spot cleanup plan by June 30, 1999.

This document presents the Policy for guidance on development of the toxic hot spot cleanup plans. This final Functional Equivalent Document (FED) explores various alternatives, provides options and recommendations, and evaluates the environmental impacts of the Policy.

This Policy provides guidance to the Regional Water Quality Control Boards (RWQCBs) on development of Toxic Hot Spot (THS) Cleanup Plans. The SWRCB held two public hearings (May 5 and 11, 1998) on the draft FED. Responses to comments received have been developed and the draft proposed Policy has been revised.

The RWQCBs will implement the Policy subsequent to approval of the regulatory provisions of the Policy by the Office of Administrative Law.

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LIST OF ABBREVIATIONS

AET	Apparent Effects Threshold
APA	Administrative Procedure Act
ASTM	American Society for Testing Materials
BMP	Best Management Practice
BPTCP	Bay Protection and Toxic Cleanup Program
CalEPA	California Environmental Protection Agency
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act (federal)
cy	cubic yard
CZARA	Coastal Zone Act Reauthorization Amendments
DDT	1,1,1-trichloro-2,2,2-bis(p-chlorophenyl)-ethane
DFG	Department of Fish and Game
DHS	Department of Health Services
DPR	Department of Pesticide Regulation
EBE	Enclosed Bays and Estuaries
EDL	Elevated Data Level
EIR	Environmental Impact Report
EMAP	Environmental Monitoring and Assessment Program
EPA	U.S. Environmental Protection Agency
EqP	Equilibrium Partitioning
ERL	Effects Range Low
ERM	Effects Range Median
FDA	U.S. Food and Drug Administration
FED	Functional Equivalent Document
g	gram(s)
gpd	gallons per day
H_2S	Hydrogen sulfide
HRS	Hazard Ranking System
kg	kilogram(s)
l	liter(s)
lf	linear foot
LTMS	Long Term Management Strategy
MAA	Management Agency Agreement
MDL	minimum detection level
mg	milligram(s)
MG	million gallons
MGD	million gallons per day
mg/l	milligrams per liter (parts per million)

MOU	Memorandum of Understanding
MTRL	Maximum Tissue Residue Level
NAS	National Academy of Sciences
ng/l	nanograms per liter (parts per trillion)
NOAA	National Oceanic and Atmospheric Administration
NOEL	No Observed Effect Level
NPDES	National Pollutant Discharge Elimination System
OAL	Office of Administrative Law
OEHHA	Office of Environmental Health Hazard Assessment
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated biphenyl
PEL	Probable effects level
PMP	Pesticide Management Plan
POTW	publicly owned treatment work
RfD	reference dose
RWQCB	Regional Water Quality Control Board
sf	square foot
SRF	State Revolving Fund
SMW	State Mussel Watch
SWRCB	State Water Resources Control Board
TBD	to be determined
TEL	Threshold Effects Level
THS	Toxic Hot Spot
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
ug/l	micrograms per liter
WDR	Waste Discharge Requirement

FINAL WATER QUALITY CONTROL POLICY

Revisions based on the comments received are presented in ~~strikeout~~ (for removed text) and underline (for added text).

FINAL
State of California

STATE WATER RESOURCES CONTROL BOARD

WATER QUALITY CONTROL POLICY

FOR GUIDANCE ON DEVELOPMENT OF REGIONAL TOXIC HOT SPOT CLEANUP PLANS

FINAL

Adopted and Effective

_____ 1998

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WATER QUALITY CONTROL POLICY
FOR GUIDANCE ON DEVELOPMENT OF
REGIONAL TOXIC HOT SPOT CLEANUP PLANS

INTRODUCTION

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) are mandated to identify toxic hot spots in the enclosed bays and estuaries of each of the seven coastal regions of the State (California Water Code Chapter 5.6, Section 13390 *et seq.*). The coastal RWQCBs are mandated to develop Regional Toxic Hot Spot Cleanup Plans specifying where and how each identified toxic hot spot will be remediated.

The Water Quality Control Policy for Guidance on Development of Regional Toxic Hot Spot Cleanup Plans is intended to provide guidance on the development of the Regional cleanup plans. The Policy contains a specific definition of a toxic hot spot, general ranking criteria, ~~and~~ the mandatory contents of the cleanup plans, and issues to be considered by the SWRCB in the development of the consolidated toxic hot spot cleanup plan. The principles contained in this Policy apply to all enclosed bays, estuaries and coastal waters.

RWQCBs shall prepare their regional toxic hot spot cleanup plans in accordance with this Policy. Any site-specific variance from the Policy shall be approved by the SWRCB Executive Director.

CONTENTS OF REGIONAL TOXIC HOT SPOT CLEANUP PLANS

The Regional Toxic Hot Spot Cleanup Plans shall contain (at a minimum) the following information:

1. Introduction

   The Introduction shall contain an identification of the Region. In general terms, the Bay Protection and Toxic Cleanup Program (BPTCP) goals (Chapter 5.6 of the California Water Code), authority and requirements to develop cleanup plans (Water Code Section 13394) shall be presented.

2. Toxic Hot Spot Definition

   The Regional cleanup plans shall then present the specific definition of a Toxic Hot Spot (THS) presented in this Policy.

3. General Criteria For Ranking Toxic Hot Spots

   The Water Code requirements for ranking criteria and the ranking criteria in this Policy shall be presented.

4. Monitoring Approach

   The BPTCP has used effects-based measurements of impacts using the sediment quality triad (sediment toxicity, benthic community structure and measures of chemical concentrations in sediments) to identify toxic hot spots in California enclosed bays and estuaries. The BPTCP has used these measures in a two-step process. The first step is to screen sites using toxicity tests, benthic community structure, or measures of chemicals in sediments or tissues. In the second step, the highest priority sites with a response in any of the measures are retested to confirm the observed response.

   The description of the monitoring approach shall be presented in the cleanup plan. If there are Region-specific modifications of the approach the modifications shall be briefly described.

5. A priority ranking of all THS (including a description of each THS including a characterization of the pollutants present at the site).

   The RWQCBs shall use the definition of a candidate and known toxic hot spot listed in this Policy to identify toxic hot spots. The RWQCBs shall then rank sites using the Ranking Criteria in this Policy. The RWQCBs shall create one list of candidate toxic hot spots and rank the list using a matrix of the ranking criteria. For the Regional Toxic Hot Spot Cleanup Plans, areas of concern and other sites where information are unavailable shall not be ranked. RWQCBs may list sites that do not meet the definition of a toxic hot spot in a separate

section under "Areas of Concern." Areas of Concern are sites with insufficient information available to declare as a candidate or known toxic hot spots.

For each candidate toxic hot spot listed in the Regional Toxic Hot Spot Cleanup Plan the following information shall be presented for each toxic hot spot:

A. Water body name. The name shall conform to the water body name in the RWQCB Basin Plan.

B. Segment Name. The RWQCBs shall list a descriptive name in the water body segment where the toxic hot spot is located if the segment name is more descriptive than the water body name.

C. Site Identification. The RWQCBs shall list a station or site identifier that can be linked to a monitoring station location (*e.g.*, BPTCP monitoring station, State Mussel Watch station, discharger self monitoring station, or any other appropriate identifier).

D. Reason for Listing. The RWQCBs shall list the reason for the site or station to be listed. The value given shall be the appropriate trigger value(s) in the definition of a Toxic Hot Spot that is (are) the cause for the listing.

E. Pollutants present at the site. The RWQCBs shall also list which chemicals are present at sufficiently high levels to be of concern.

F. Report reference substantiating toxic hot spot listing. All references supporting the designation of the toxic hot spot shall be listed with the other information required for designation of a toxic hot spot. The references shall include, but not be limited to: author, year of publication, title of report, and other identifying information [*e.g.*, name of journal (including volume and pages), RWQCB file number, agency report, or other identifier that will allow the report to be independently located].

6. Each candidate toxic hot spot with a "High" priority ranking shall be listed separately and the following information compiled for the site by the RWQCBs:

   A. An assessment of the areal extent of the toxic hot spots.

      The RWQCB shall characterize the areal extent of the toxic hot spot. For the proposed cleanup plans, the RWQCB shall estimate the boundary, size and/or volume of the toxic hot spot. In determining the areal extent the RWQCB shall consider a temporal component (*i.e.,* the historic versus ongoing nature of the toxic hot spot) and the mix of chemicals present as well as any available information on toxicity and benthic community composition that would assist in characterizing the areal extent of the toxic hot spot. When considering sediments, the RWQCB shall consider the volumes to be addressed and depth of polluted sediments present at the site.

   B. An assessment of the most likely sources of pollutants (potential dischargers).

      RWQCBs shall list potential dischargers that are likely to have discharged or deposited the pollutants identified in the toxic hot spot lists.

      Potential discharger identification shall be dependent on factors such as, site location, pollutant type, mix of chemicals found to be present at the site, and identification and location of the potential discharger.

      In some cases, after a site is identified as a toxic hot spot, there may not be any identified potential discharger to assume the responsibility of cleanup. In such cases the identified toxic hot spot would remain reported as a toxic hot spot in the cleanup plan lists. The RWQCB and the SWRCB would assume the role of leadership to initiate cleanup through the adoption of the Consolidated Statewide Toxic Hot Spot Cleanup Plan.

   C. A summary of actions that have been initiated by the RWQCBs to reduce the accumulation of pollutants at existing THSs and to prevent the creation of new THSs.

The summary of actions shall contain descriptions of any issued waste discharge requirements, National Pollutant Discharge Elimination System (NPDES) permits, general permits (*e.g.,* construction, industrial stormwater, *etc.*), cleanup and abatement orders, cease and desist orders, administrative civil liability orders, actions taken or initiated by other State or Federal agencies (*e.g.,* Department of Defense Base Closure, Damage Assessment activities of the National Oceanic and Atmospheric Administration, etc.), or any other actions.

D. Preliminary assessment of actions required to remedy or restore a THS ~~to an unpolluted condition~~ including recommendations for remedial actions.

The RWQCBs shall evaluate the alternatives listed in the ~~Cleanup~~ Remediation Methods section of this Policy. After evaluating the ~~cleanup~~ remediation alternatives the RWQCBs shall list their assessment of the actions that could be implemented.

In developing this preliminary list of actions the RWQCBs shall list, to the extent possible, potential environmental impacts of the proposed actions (either in the plan or in a separate report). These impacts could include, but are not limited to: impacts of sediment disposal, secondary impacts of dredging, disposal, pollutant releases from capped sites, pollutant releases from disposal facilities (both aquatic and upland), pollutant release during treatment or as a by-product of treatment (gaseous, solid and liquid), potential impacts of constructing new facilities to treat effluents, sludge disposal, possible air quality impacts, alterations in sewer systems, etc.

During implementation of the consolidated cleanup plan, the RWQCBs shall work with responsible parties to determine the appropriate and reasonable cleanup or remediation level.

E. An estimate of the total cost to implement the cleanup plan.

RWQCBs shall estimate costs of cleanup plan implementation using the estimates provided in this Policy or other referenced source. RWQCBs may deviate from the cost estimate in this Policy if justified in writing in the cleanup plan. If a potential discharger has been identified, the RWQCB shall require in the cleanup plan that the discharger prepare a proposal for site remedial actions. The proposal for site remediation shall include, but not be limited to, assessment of the areal extent of the toxic hot spot, cleanup actions and monitoring to assess effectiveness of any implemented cleanup actions. The RWQCB will also present a list of benefits (consistent with the guidance in this Policy) derived by implementing the cleanup plan.

F. An estimate of recoverable costs from potential dischargers.

The costs recoverable from potential dischargers shall be developed by the RWQCBs, if possible. The costs shall be justified in the cleanup plan.

G. A two-year expenditure schedule identifying funds to implement the plans that are not recoverable from potential dischargers.

The RWQCBs shall develop a brief workplan for the implementation of the cleanup plans for sites without potential dischargers identified. The workplan shall contain costs and estimated schedule for: finding polluted sediments or water (monitoring), assessment of areal extent of the toxic hot spot, implementation of remedial actions including, but not limited to, sediment removal and disposal, treatment of removed sediments, ~~or~~ capping of polluted sediments, possible changes in WDRs, suggestions for improvements in wastewater discharge, or recommendations for implementing watershed management approaches. The expenditure plan shall also contain a funding proposal for assessing the effectiveness of remediation.

SPECIFIC DEFINITION OF A TOXIC HOT SPOT

The following specific definition provides a mechanism for identifying and distinguishing between "candidate" and "known" toxic hot spots. A candidate toxic hot spot is considered to have enough information to designate a site as a known toxic hot spot except that the candidate hot spot has not been approved by the RWQCB and the SWRCB. Once a candidate toxic hot spot has been adopted into the consolidated statewide toxic hot spot cleanup plan then the site shall be considered a known toxic hot spot and all the requirements of the Water Code shall apply to that site.

Candidate Toxic Hot Spot

A site meeting any one or more of the following conditions is considered to be a "candidate" toxic hot spot.

1. The site exceeds water or sediment quality objectives for toxic pollutants that are contained in appropriate water quality control plans or exceeds water quality criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA).

   This finding requires chemical measurement of water or sediment, or measurement of toxicity using tests and objectives stipulated in water quality control plans. Determination of a toxic hot spot using this finding should rely on recurrent measures over time (at least two separate sampling dates). Suitable time intervals between measurements must be determined.

2. The water or sediment exhibits toxicity associated with toxic pollutants that is significantly different from the toxicity observed at reference sites (*i.e.*, when compared to the lower confidence interval of the reference envelope or, in the absence of a reference envelope, is significantly toxic as compared to controls (using a t-test) and the response is less than ~~80~~ 90 percent of the minimum significant difference for each specific test organism ~~control value~~), based on toxicity tests acceptable to the SWRCB or the RWQCBs.

   To determine whether toxicity exists, recurrent measurements (at least two separate sampling dates) should demonstrate an effect. Appropriate reference and control measures must be included in the toxicity testing. The methods acceptable to and used by the BPTCP may include some toxicity test protocols

not referenced in water quality control plans (*e.g.*, the BPTCP Quality Assurance Project Plan). Toxic pollutants should be present in the media at concentrations sufficient to cause or contribute to toxic responses in order to satisfy this condition.

3. The tissue toxic pollutant levels of organisms collected from the site exceed levels established by the United States Food and Drug Administration (FDA) for the protection of human health, or the National Academy of Sciences (NAS) for the protection of human health or wildlife. When a health advisory against the consumption of edible resident non-migratory organisms has been issued by Office of Environmental Health Hazard Assessment (OEHHA) or Department of Health Services (DHS), on a site or water body, the site or water body is automatically classified a "candidate" toxic hot spot if the chemical contaminant is associated with sediment or water at the site or water body.

   Acceptable tissue concentrations are measured either as muscle tissue (preferred) or whole body residues. Residues in liver tissue alone are not considered a suitable measure for candidate toxic hot spot designation. Animals can either be deployed (if a resident species) or collected from resident populations. Recurrent measurements in tissue are required. Residue levels established for one species for the protection of human health can be applied to any other consumable species.

   Shellfish: Except for existing information, each sampling episode should include a minimum of three replicates. The value of interest is the average value of the three replicates. Each replicate should be comprised of at least 15 individuals. For existing State Mussel Watch information related to organic pollutants, a single composite sample (20-100 individuals), may be used instead of the replicate measures. When recurrent measurements exceed one of the levels referred to above, the site is considered a candidate toxic hot spot.

   Fin-fish: A minimum of three replicates is necessary. The number of individuals needed will depend on the size and availability of the animals collected; although a minimum of five animals per replicate is recommended. The value of interest is the average of the three replicates. Animals of similar age and reproductive stage should be used.

4. Impairment measured in the environment is associated with toxic pollutants found in resident individuals.

   Impairment means reduction in growth, reduction in reproductive capacity, abnormal development, histopathological abnormalities. Each of these measures must be made in comparison to a reference condition where the endpoint is measured in the same species and tissue is collected from an unpolluted reference site. Each of the tests shall be acceptable to the SWRCB or the RWQCBs.

   Growth Measures: Reductions in growth can be addressed using suitable bioassay acceptable to the SWRCB or RWQCBs or through measurements of field populations.

   Reproductive Measures: Reproductive measures must clearly indicate reductions in viability of eggs or offspring, or reductions in fecundity. Suitable measures include: pollutant concentrations in tissue, sediment, or water which have been demonstrated in laboratory tests to cause reproductive impairment, or significant differences in viability or development of eggs between reference and test sites.

   Abnormal Development: Abnormal development can be determined using measures of physical or behavioral disorders or aberrations. Evidence that the disorder can be caused by toxic pollutants, in whole or in part, must be available.

   Histopathology: Abnormalities representing distinct adverse effects, such as carcinomas or tissue necrosis, must be evident. Evidence that toxic pollutants are capable of causing or contributing to the disease condition must also be available.

5. Significant degradation in biological populations and/or communities associated with the presence of elevated levels of toxic pollutants.

   This condition requires that the diminished numbers of species or individuals of a single species (when compared to a reference site) are associated with concentrations of toxic pollutants. The analysis should rely on measurements from multiple stations. Care should be taken to ensure that at least

one site is not degraded so that a suitable comparison can be made.

Known Toxic Hot Spot

A site meeting any one or more of the conditions necessary for the designation of a "candidate" toxic hot spot that has gone through a full SWRCB and RWQCB hearing process, is considered to be a "known" toxic hot spot. A site will be considered a "candidate" toxic hot spot until approved by the SWRCB as a "known" toxic hot spot in the consolidated toxic hot spot cleanup plan.

RANKING CRITERIA

A value for each criterion described below shall be developed provided appropriate information exists or estimates can be made. Any criterion for which no information exists shall be assigned a value of "No Action". The RWQCB shall create a matrix of the scores of the ranking criteria. The RWQCBs shall determine which sites are "High" priority based on the ~~six~~ five general criteria (below) keeping in mind the value of the water body. The RWQCBs shall provide the justification or reason a rank was assigned if the value is an estimate based on best professional judgment.

Human Health Impacts

Human Health Advisory issued for consumption of non-migratory aquatic life from the site (assign a "High"); Tissue residues in aquatic organisms exceed FDA/DHS action level or U.S. EPA screening levels ("Moderate").

Aquatic Life Impacts

For aquatic life, site ranking shall be based on an analysis of the preponderance of information available (*i.e.*, weight-of-evidence). The measures that shall be considered are: ~~the sediment quality triad (~~sediment chemistry, sediment toxicity, ~~and~~ biological field assessments (including benthic community analysis), water toxicity, toxicity identification evaluations (TIEs), and bioaccumulation.

Stations with hits in any two of the biological measures if associated with high chemistry, assign a "High" priority. A hit in one of the measures associated with high chemistry is assigned

"moderate", and high sediment or water chemistry only shall be assigned "low". In analyzing the preponderance of information available, RWQCBs should take into consideration that impacts related to biological field assessments (including benthic community structure) are of more importance than other measures of impact.

Water Quality Objectives[1]

Any chemistry data used for ranking under this section shall be no more than 10 years old, and shall have been analyzed with appropriate analytical methods and quality assurance.

Water quality objective or water quality criterion: Exceeded regularly (assign a "High" priority), occasionally exceeded ("Moderate"), infrequently exceeded ("Low").

Areal Extent of Toxic Hot Spot

Select one of the following values: More than 10 acres, 1 to 10 acres, less than 1 acre.

~~***Pollutant Source***~~

~~Select one of the following values: Source(s) of pollution identified (assign a "High" priority), Source(s) partially known ("Moderate"), Source is unknown ("Low").~~

Natural Remediation Potential

Select one of the following values: Site is unlikely to improve without intervention ("High"), site may or may not improve without intervention ("Moderate"), site is likely to improve without intervention ("Low").

Overall Ranking

The RWQCB shall list the overall ranking for the candidate toxic hot spot. Based on the interpretation and analysis of the five previous ranking criteria, ranks shall be established by the RWQCBs as "high", "moderate" or "low."

[1] Water quality objectives to be used are found in Regional Water Quality Control Board Basin Plans or the California Ocean Plan (depending on which plan applies to the water body being addressed). Where a Basin Plan contains a more stringent value than the statewide plan, the regional water quality objective will be used.

TABLE 1: NAS, FDA, AND U.S. EPA LIMITS RELEVANT TO THE BPTCP (NG/G WET WEIGHT)

Chemical	NAS Recommended Guideline[2] (whole fish)	FDA Action Level or Tolerance[3] (edible portion)	USEPA Screening Values[4] (edible portion)
Total PCB	500	2000**	10
Total DDT	50	5000	300
aldrin	*	300**,***	-
dieldrin	*	300**,***	7
endrin	*	300**,***	3000
heptachlor	*	300**,***	-
heptachlor epoxide	*	300**,***	10
lindane	50	-	80
chlordane	50	300	80
endosulfan	50	-	20,000
methoxychlor	50	-	-
mirex	50	-	2000
toxaphene	50	5000	100
hexachlorobenzene	50	-	70
any other chlorinated hydrocarbon pesticide	50	-	
dicofol	-	-	10,000
oxyfluorfen	-	-	800
dioxins/dibenzofurans	-	-	$7x10^{-4}$
terbufos	-	-	1000
ethion	-	-	5000
disulfoton	-	-	500
diazinon	-	-	900
chlorpyrifos	-	-	30,000
carbophenothion	-	-	1000
cadmium	-	-	10,000
selenium	-	-	50,000
mercury	-	1000**(as methyl mercury)	600

*Limit is 5 ng/g wet weight. Singly or in combination with other substances noted by an asterisk.
**Fish and shellfish.
***Singly or in combination for shellfish

[2] National Academy of Sciences. 1973. Water Quality Criteria, 1972 (Blue Book). The recommendation applies to any sample consisting of a homogeneity of 25 or more fish of any species that is consumed by fish-eating birds and mammals, within the same size range as the fish consumed by any bird or mammal. No NAS recommended guidelines exist for marine shellfish.

[3] U.S. Food and Drug Administration. 1984. Shellfish Sanitation Interpretation: Action Levels for Chemical and Poisonous Substances. A tolerance, rather than an action level, has been established for PCB.

[4] U.S. Environmental Protection Agency. 1993. Guidance for assessing chemical contaminant data for use in fish advisories. Volume 1. EPA 823-R-93-002. Office of Water. Washington, D.C.

TOXIC HOT SPOT REMEDIATION ~~SEDIMENT CLEANUP~~ METHODS

Each ~~known and~~ candidate toxic hot spot shall be evaluated to determine which technique or techniques would best remediate the toxic hot spot. In determining the remedial action(s), each RWQCB shall identify remediation techniques that are technically feasible and reasonably cost-effective. Selection of the alternatives involves choosing the remediation option that is appropriate for the site (*i.e.*, protective of its beneficial uses). This section contains approaches for addressing both sediment and water remediation activities.

Sediment Remediation Methods

The use of remediation technologies and controls is still emerging. Generally, the field has been dominated by tools developed for navigation dredging, and few full scale treatment systems have been implemented.[5] No one option shall be selected in the cleanup plans especially if a discharger is identified as being responsible for the site (in order to comply with Water Code Section 13360).

Tables 2 through 12 list many of the types of remediation that shall be considered by the RWQCBs in developing the regional toxic hot spot cleanup plans for remediation of sediments in enclosed bays, estuaries and the ocean. For each type of remediation technology, the Tables present: (1) the state of the practice, (2) advantages and effectiveness, (3) limitations of the methods, and (4) any identified research needs.

Each RWQCB shall provide an analysis of a range of treatment technologies or alternatives for comparison of the cost effectiveness. The RWQCBs may elect to not consider one or more of the alternatives (below) if the alternative is not feasible for the site.

1. Treatment of the site sediments only.

   Site treatment involves the physical or chemical alteration of material. The treatment must reduce or eliminate the toxicity, mobility, or volume of polluted material. Treatment may be

[5] National Research Council. 1997. Contaminated sediments in ports and waterways: Cleanup strategies and technologies. Committee on Contaminated Marine Sediments, Marine Board, Commission on Engineering and Technical Systems, National Research Council. National Academy Press, Washington, D.C. 295 pp.

either (a) *in situ*, or (b) *ex situ*. In situ treatment requires uniform treatment and confirmation of effectiveness; however, *in situ* methods generally have not been considered effective in marine sediments.

Ex situ treatment requires a treatment area, or a dedicated site to assure effectiveness.

Types of treatment include:

- *in situ* bioremediation (Table 2),
- soil washing and physical separation (Table 3),
- chemical separation and thermal desorption (Table 4),
- immobilization (Table 5),
- thermal and chemical destruction (Table 6), and
- *ex situ* bioremediation (Table 7).

The treatment choice shall be pollutant specific. The choice depends upon the chemical characteristics of the pollutants, as well as physical and chemical characteristics of the sediments; for example, clay content, organic carbon content, salinity, and water content. Some treatment options produce by-products which require further handling. If the safety and effectiveness of treatment options are not well known, bench tests and pilot projects shall be performed prior to authorization of the use of such treatment methods.

2. Dredging: Sediment Removal and Disposal or Reuse

Dredging may be combined with containment or off-site disposal (Table 8). Selection of the method depends upon the concentration of pollutants and the amount of resuspension of sediments caused by the dredge at the removal site and at the disposal site. To reduce the transport of polluted sediment to other areas, silt curtains constructed of geotextile fabrics may be utilized to minimize migration of the resuspended sediments beyond the area of removal. Consideration must also be given to temporary loss of benthic organisms at the removal site and at the disposal site.

Table 2: In-Situ Bioremediation

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) None documented for marine sediments; (b) examples from freshwater sediment are limited to special cases on pilot scale, e.g., chemical stimulation of dehalogenation (but no degradation) of PCBs in the Houseatonic River, Connecticut; (c) stimulation of degradation with addition of active microbes in Hudson River, New York.	(a) Pollutant is biologically available; (b) concentration of pollutant appropriate for bioactivity, e.g., sufficiently high to serve as substrate or not high enough to be toxic; (c) limited number or classes of pollutants that are biodegradable; less known for complex mixtures; (d) site is reasonably accessible for management and monitoring; (e) rapid solution is not required.	Based on experience from soil systems, it offers the potential for (a) complete degradation and elimination of organic pollutants; (b) reduced toxicity of sediment from partial biotransformation; (c) less materials handling, which can result in substantially lower costs; (d) no need for placement sites; (e) favorable public response and acceptability.	(a) Not a proven technology for sediments (freshwater or marine); (b) likely to require manipulation and disturbance of sediment; (c) can require containment which limits volume that is treatable; (d) can require long time periods, especially in temperate waters; (e) ineffective for low level pollution; (f) not applicable to areas of high turbulence or sheer; (g) not applicable for high molecular weight polyaromatic hydrocarbons.	(a) Fundamental understanding of biodegradation principles in marine environments; (b) bioavailability of sorbed pollutants and the effect of aging; (c) exploration of anaerobic degradation processes for the largely impacted near-shore anoxic sediments; (d) laboratory, pilot, and field demonstration of effectiveness for marine sediments; (e) interaction of physical, chemical, and microbiological processes on biodegradation, e.g., sediment composition, hydrodynamics; (f) analysis of cost-effectiveness; (g) exploration of combining in-situ bioremediation with capping.

Table 3: Soil Washing and Physical Separation

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Well developed by mining industry and frequently used for sediments.	Where pollutant is predominantly associated with fine-grained material that is a small fraction of the total solids.	(a) Mature technology that can reduce volumes of polluted material requiring subsequent treatment; (b) soil washing can be used to recover Confined Disposal Facility space for later reuse.	Original sediments must have a significant proportion of sand for the process to be cost effective.	None identified.

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Table 4: Chemical Separation and Thermal Desorption

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) Pilot plant studies conducted on metal desorption by acid-leaching solutions and at least one full-scale implementation; (b) pilot and full-scale application of organics separation by liquid solvents and supercritical fluids; (c) organic chemical thermal desorption also has had full-scale demonstration; (d) thermal desorption used at Waukegan Harbor.	Suitable for weakly bound organics and metals.	Pollutant is removed and concentrated.	(a) Batch extraction during separation requires multiple cycles to achieve high removal; (b) fluid-solid separation is difficult for fine-grained materials; (c) a separate reactor is needed to remove the pollutant from the extracting fluid so that the extracting fluid can be reused; (d) thermal desorption requires temperatures that will vaporize water, and sediment particles must be eliminated from gaseous discharge; (e) pollutant removal from the gas phase following thermal desorption is another treatment process that is required.	Systems integration for complete pollutant isolation or destruction.

Table 5: Immobilization

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Extensive knowledge based on inorganic immobilization within solid wastes and dry soils.	Chemical fixation and immobilization of trace metals.	(a) Chemical isolation from biologically accessible environment; (b) process is simple and there is a history of use for sludge.	(a) Sediment should have moisture content of less than 50 percent, and solidified volumes can be 30 percent greater than starting material; (b) limited applicability to organic pollutants; (c) high organic pollutant levels may interfere with treatment for metals immobilization; (d) need for placement of solidified sediments.	(a) Studies of long-term effectiveness for pollutant isolation; (b) develop sediment placement options, especially for beneficial uses.

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Table 6: Thermal and Chemical Destruction

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Thermal oxidation in flame and thermal reduction in nonflame reactors have been extensively tested and demonstrated.	Process destroys organic pollutants in sediment samples at efficiencies of greater than 99.99 percent but at very high costs.	Very effective.	(a) Very expensive; (b) metals mobilized into the gas phase require gas phase scrubbing; (c) water content of sediment increases energy costs.	(a) process control to prevent upsets and effluent gas treatment for metals containment; (b) facility design to control the destruction process.

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Table 7: Ex Situ Bioremediation

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) Limited experience; (b) transfer of soil-based technologies to marine sediments is not proved and may not be directly applicable because of the different biogeochemistry of marine sediments; (c) but general trends should translate; (d) examples from freshwater sediment have been carried out at the pilot scale in the assessment and remediation of polluted sediments program, as well as in Europe; (e) PCBs were treated ex situ at a Sheboygan River site.	(a) Pollutant is biologically available; (b) concentration of pollutant appropriate for bioactivity (e.g., sufficiently high to serve as substrate, not high enough to be toxic); (c) limited number or classes of pollutants are biodegradable; less known for complex mixtures; (d) site is reasonable accessible for management and monitoring; (e) rapid solution is not required.	Based on experience from freshwater systems, it offers the potential for (a) degradation (as opposed to mass transfer) of some organic pollutants; (b) possible reduction of toxicity from biotransformation in those cases in which complete mineralization does not occur; (c) containment of polluted material allowing for an engineered system and enhanced rates, when compared to in situ biotransformations; (d) public acceptability.	(a) Far from a proven technology--all work with marine sediments is at the bench-scale; (b) requires handling of polluted sediment; (c) slow compared to chemical treatment; (d) ineffective for low levels of pollution, and does not remove 100 percent of pollutants; (e) not applicable for very complex organics, such as high-molecular-weight compounds; (f) susceptible to matrix effects on bioavailability.	(a) Fundamental understanding of biodegradation principles in engineered systems; (b) exploration of aerobic/anaerobic combinations or comparisons; (c) laboratory, pilot, and field demonstrations; (d) analysis of cost effectiveness; (e) exploration of bioremediation as part of more extensive treatment trains.

Table 8: Confined Disposal Facility

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) The most commonly used placement alternative for polluted sediments; (b) hundreds of sites nationwide for navigation dredging projects; (c) often used for pretreatment prior to final placement or as final sediment placement site for remediation projects.	Applicable to a wide variety of sediment types and project conditions.	(a) Low cost compared to ex situ treatment; (b) compatible with a variety of dredging techniques, especially direct placement by hydraulic pipeline; (c) proper design results in high retention of suspended sediments and associated pollutants; (d) engineering for basic containment normally involves conventional technology; (e) controls for pollutant pathways usually can be incorporated into site design and management; (f) conventional monitoring approaches can be used; (g) site can be used for beneficial purposes following closure, with proper safeguards.	(a) Does not destroy or detoxify pollutants unless combined with treatment; (b) control of some pollutant loss pathways may be expensive.	(a) Design approaches, such as covers and liners, needed for low cost pollutant controls; (b) design criteria for treatment of releases or control strategies for high profile contaminates; (c) methods for site management to allow restoration of site capacity and potential use of treated materials.

Selection of the dredging method shall take into account the physical characteristics of the sediments, the sediment containment capability of the methods employed, the volume and thickness of sediments to be removed, the water depth, access to the site, currents, and waves. Consideration shall also be given to placement site of the material once it is removed.

Typical dredging methods include mechanical or hydraulic dredging. Mechanical dredging often employs clamshell buckets and dislodges sediments by direct force. Sediments can be resuspended by the impact of the bucket, by the removal of the bucket, and by leakage of the bucket. Mechanical dredging generally produces sediments low in water content.

Hydraulic dredging uses centrifugal pumps to remove sediments in the form of a slurry. Although less sediment may be resuspended at the removal site, sediment slurries contain a very high percentage of water at the end of the pipe.

Removal and consolidation often involves a diked structure which retains the dredged material (Tables 9 and 10). Considerations include:

A. construction of the dike or containment structure to assure that pollutants do not migrate,

B. the period of time for consolidation of the sediments,

C. disturbance or burying of benthic organisms,

D. disposal to an off-site location, either upland (landfill), in-bay, or ocean. Considerations once the material has been dredged shall be (1) staging or holding structures or settling ponds, (2) de-watering issues, including treatment and discharge of wastewater, (3) transportation of dredged material, (*i.e.*, pipeline, barge, rail, truck), or (4) regulatory constraints.

Table 9: Contained Aquatic Disposal

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Limited application. Reviews exist concerning (a) necessary data, equipment, and procedures; (b) engineering considerations; (c) guidelines for cap armoring design; (d) predicting chemical containment effectiveness.	(a) Costs and environmental effects of relocation are factors; (b) suitable types and quantities of cap material are available; (c) hydrologic conditions will not compromise the cap; (d) cap can be supported by original bed; (e) appropriate for sites where excavation is problematic or removal efficiency is low; (f) cap material is compatible with existing aquatic environment.	(a) Eliminates need to remove polluted sediments; (b) cost effective for sites with large surface areas; (c) effective in containing pollutants by reducing bioaccessibility; (d) promotes in situ chemical or biological degradation; (e) maintains stable geochemical and geohydraulic conditions, minimizing pollutant release to surface water, groundwater, and air.	(a) Laboratory and field validation of capping procedures and tools; (b) analysis of data from existing and ongoing field demonstrations to support capping effectiveness; (c) test for chemical release during bed placement and consolidation; (d) tests to evaluate and simulate the effects of cap penetration by deep burrowing organisms; (e) simulate and evaluate consequences of mixing; (f) potential loss of pollutants to the water column may require controls during placement.	(a) Design criteria for treatment of releases or control strategies for high-profile pollutants; (b) improved methods for evaluation of potential pollutant release pathways; (c) develop reliable cost estimates.

Table 10: Landfills

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Used for several dredged material and Superfund projects involving polluted sediments.	(a) Small volumes; (b) where no other alternatives or sites are available.	(a) Does not require acquisition of permanent placement site; (b) may be most cost effective for small volumes; (c) effectiveness is inherent in the site license.	(a) Lack of landfill capacity in most regions of the country; (b) requires handling and transport to the landfill; (c) restriction on free liquids requires dewatering as a pretreatment step.	Improved methods for rehandling, dewatering, and transporting dredged sediments.

3. Containment of Polluted Sediments

Containment can prevent human or ecological exposure, or prevent migration of pollutants. Containment can be either in-place capping, or removal and consolidation at a disposal structure (Tables 9 and 11). Containment options such as capping clearly reduce the short-term exposure, but require long-term monitoring to track their effectiveness.

The considerations for stabilization of sites using sub-aqueous capping to contain toxic waste at a site includes:

A. Capping provides adequate coverage of polluted sediments and capping materials can be easily placed.

B. The integrity of the cap should be assured to prevent burrowing organisms from mixing of polluted sediments (bioturbation).

C. The ability of the polluted sediment to support the cap, *i.e.,* causing settlement or loading.

D. The bottom topography causing sloping or slumping of the capped material during seismic events.

E. Cap erosion or disruption by currents, waves, bioturbation, propeller wash, or ship hulls.

F. Future use of capped area, *i.e.,* use as shipping channel.

4. No Remediation

This alternative consists of two elements: (a) institutional or ~~access~~ interim controls ~~(or "natural remediation")~~ and (b) the natural remediation or no-action alternative. The first element, institutional controls, could include, but is not limited to, posting of warning signs, or monitoring of water, sediments, or organisms. This element would be protective of human health by providing warning signs for fishing, *etc.*, but not protective of aquatic life.

Table 11: In-Place Capping

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Less than 10 major in situ capping projects in North America have been completed (more than 20 worldwide). Reviews exist concerning (a) necessary data, equipment, and procedures; (b) engineering considerations; (c) guidelines for design of cap armor; and (d) predicting effectiveness of chemical containment.	(a) Pollutant sources have been substantially abated; (b) natural recovery is too slow; (c) costs and environmental effectiveness of relocation are too high; (d) suitable types and quantities of cap material are available; (e) hydrologic conditions will not compromise the cap; (f) cap can be supported by original bed; (g) appropriate for sites where excavation is problematic or removal efficiency is low.	(a) Eliminates need to remove polluted sediments; (b) effective in containing pollutants by reducing bioaccessibility; (c) promotes in situ chemical or biological degradation; (d) maintains stable geochemical and geohydraulic conditions, minimizing pollutant release to surface water, groundwater, and air; (e) relatively easy to implement; (f) eliminates bioturbation and resuspension; (g) reduces pollutant release to water column; (h) easily replaced or repaired; (i) in shallow water, creates wetlands, dry lands, or reduces water column depth.	(a) Cap incompatible with bottom material can alter benthic community; (b) subject to erosion by strong currents and wave action; (c) subject to penetration/destruction by deep burrowing organisms; (d) destroys/changes benthic communities/ecological niches; (e) requires ongoing monitoring for cap integrity; (f) dilutes pollutants in original bed if subsequent removal/remediation is required.	(a) Analysis of data from existing and ongoing field demonstrations to support capping effectiveness; (b) controls for chemical release during bed placement and consolidation; (c) test to simulate and evaluate consequences of episodic mixing, such as anchor penetration, propeller wash, and/or mechanical penetration.

The second element is the "natural remediation or no-action alternative". If by no action, the toxic hot spot is to be left in place, because to move it, or to disturb it in any way would be detrimental, then "no action" shall be considered as the last alternative. The ~~no~~ natural remediation/no-action alternative shall be considered only after all other alternatives have been studied ~~(Table 12)~~.

If the ~~no~~ natural remediation/no-action alternative is to be implemented, the RWQCB shall consider all the factors specified in Table 12 plus determine the following: (a) point source discharges have been controlled, (b) the costs and environmental effects of moving and treating polluted sediment are too great, (c) hydrologic conditions will not disturb the site, (d) the sediment will not be remobilized by human or natural activities, such as by shipping activity or bioturbation, (e) notices to abandon the site have been issued to appropriate federal, state, and local agencies and to the public, (f) the exact location of the site and a list of chemicals causing the toxic hot spot and their quantities are noted on deeds, maps, and navigational charts, and (g) a monitoring program is established to measure changes in discharge rates from the site.

If a ~~no~~ natural remediation alternative is considered, RWQCBs shall provide an assessment of the geographic extent of the pollution, the depth of the pollution in the sediment, compelling evidence that no treatment technologies shall be applied and that only the ~~no~~ natural remediation alternative is feasible at the site, and a cleanup cost comparison of all other treatment technologies versus the no-remediation alternative.

If a ~~no~~ natural remediation alternative is considered, the following information shall be provided in the Regional cleanup plan:

A. Sources of pollution which caused the toxic hot spot to exist.

B. A monitoring program description, specifying the duration of the monitoring, and all organizations which will carry it out.

C. Monitoring program which will show whether rates of pollutant release and the area of influence of the pollutants are not accelerating.

D. Detailed assessment containing proof that all of the following statements are true:

(1) Pollutant discharge has been controlled.

(2) Burial or dilution processes are rapid.

(3) Sediment will not be remobilized by human or natural activities.

(4) Environmental effects of cleanup are equal to or more damaging than leaving the sediment in place.

(5) Unpolluted sediments from the drainage basin will integrate with polluted sediments through a combination of dispersion, mixing, burial, and/or biological degradation.

(6) Polluted sediments at the site will not spread.

(7) The site will be noted on appropriate maps, charts, and deeds to document the exact location of the site.

For no-remediation alternatives, a map of the area shall be required to be provided by potential discharger(s) to the U.S. Army Corps of Engineers, U.S. Coast Guard, National Oceanic and Atmospheric Administration, Coastal Commission, State Lands Commission, and harbor authorities to be included on official navigational charts and other maps to document the exact location of the site and the depth of the site and the pollutants encountered.

Table 12: Natural Recovery

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Selected for James River, New York Kepone pollution and considered at Port of Tacoma, Washington site.	(a) Bed is stable or depositional; (b) chemical release rates are low; (c) interim controls can maintain safety to health and environment; (d) pollution level at active surface is low, but areal extent is large; (e) most of the pollution is below the bioturbed zone; (f) pollutants are underlain by low permeability strata; (g) site is not subject to dredging or other disturbance; (h) source of pollution has been abated.	(a) There may be less environmental risk to await natural capping than to attempt sediment removal; (b) removal may cause physical harm to bottom communities as well as suspend and disperse pollutants; (c) cleanup cost may be prohibitive because of large area and low level of pollution; (d) low cost.	(a) Effectiveness of in-bed processes that govern chemical containment and/or destruction is poorly known; (b) bed remains subject to resuspension by storms or anthropogenic processes; (c) should only rarely be used in beds of flowing streams; (d) not appropriate if dredging is required or bulk quantities of chemicals, such as non-aqueous liquids or solids, are present.	(a) Develop scientific principles to describe the process of natural recovery; (b) based on a literature survey, document the success, failure, effectiveness, *etc.*, of sites that have undergone natural recovery either by design or default; (c) develop accepted measuring protocols to determine in situ chemical flux from bed sediment to the overlying water column; (d) develop protocols for assessing the relative contribution of the five or more mechanisms for chemical release or movement from bed sediments.

Remediation Methods for Water-related Toxic Hot Spots

The three basic approaches which may be practiced independently or concurrently are pollution prevention, pretreatment and recycle and reuse. The RWQCBs shall develop prevention activities tailored to local conditions and the tools available. The RWQCBs shall also provide enough flexibility to dischargers so they can select the most cost-effective approaches for addressing wastewater-related problems. If the RWQCBs have more recent or site-specific information on treatment technology, the RWQCB may use an alternative approach. If the RWQCB cannot determine which prevention tools will be most effective, the selection of methods to address water-related toxic hot spots should be made during the implementation of watershed management approaches that contrast alternate ways to solve the identified problems.

A large number of technically feasible wastewater treatment methods are available. In developing the cleanup plans the RWQCBs shall base their assessments of possible treatment technologies on the effectiveness of removing the pollutant(s) of concern. No one option shall be selected in the cleanup plans especially if discharger(s) are identified as being responsible for the toxic hot spot (in order to comply with Water Code Section 13360). Methods for addressing stormwater and nonpoint sources are emerging and RWQCBs should use their best judgment in suggesting approaches (and their costs).

~~SEDIMENT CLEANUP~~ REMEDIATION COSTS

Sediment Cleanup Costs

Total costs for various remedial technologies is dependent upon many factors, some of the most important being pollutant concentration, cleanup level, physical characteristics of the sediment, and the volume of material to be remediated. In addition, overall costs of remediation should also include monitoring to evaluate the effectiveness of cleanup. Due to the large number of variables associated with remedial actions and availability of disposal sites, the costs for any cleanup will necessarily be project specific.

Tables 13 and 14 provide a qualitative assessment of the various categories of technology. RWQCBs shall use either the estimates in Table 13 and Table 14 or use project-specific estimates of

cleanup costs. Obtaining new estimates will allow a more realistic comparison of the cost-effectiveness and benefits of the selected alternatives.

Wastewater Treatment System, Stormwater, or Nonpoint Source Costs

The costs for implementing the waste water treatment technologies and best management practices are discharge- and site-specific. In developing estimates the RWQCBs shall use the EPA Treatability Manual, applicable National Research Council reports, site-specific estimates, or delay the development of cost estimates if the toxic hot spot will be addressed as part of a watershed management effort. If cost estimates are delayed the RWQCBs shall develop cost estimates for developing and coordinating the watershed planning effort.

BENEFITS OF REMEDIATION

In developing the regional toxic hot spot cleanup plans the RWQCBs will list the benefits that will be derived by remediating candidate toxic hot spots. It is acknowledged that the benefits to be developed by the RWQCBs are qualitative estimates. The list of possible benefits of remediation are presented in Table 15.

Table 13: Qualitative Comparison of the State of the Art in Remediation Technologies

Feature technology	State of Design Guidance	Number of Times Used	Scale of Application	Cost (per cubic yard)	Limitations
Natural recovery	Nonexistent	2	Full scale.	Low.	Source control Sedimentation Storms.
In place containment	Developing rapidly	<10	Full scale.	<$20.	Limited technical guidance. Legal/regulation uncertainty.
In place treatment	Nonexistent	~2	Pilot scale.	Unknown.	Technical problems. Few proponents. Need to treat entire volume.
Excavation and containment.	Substantial and well developed	Several hundred	Full scale.	$20 to $100.	Site availability Public assistance.
Excavation and treatment	Limited and extrapolated from soil	<10	Full scale.	$50 to $1,000.	High cost. Inefficient for low concentration. Residue toxic. Need for treatment train.

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Table 14: Comparative Analysis of Sediment Technology Categories

Approach	Feasibility	Effective	Practicality	Cost
INTERIM CONTROL				
Administrative	0	4	2	4
Technological	1	3	1	3
LONG-TERM CONTROL				
In Situ				
Natural recovery	0	4	1	4
Capping	2	3	3	3
Treatment	1	1	2	2
Sediment Removal and Transport	2	4	3	2
Ex Situ Treatment				
Physical	1	4	4	1
Chemical	1	2	4	1
Thermal	4	4	3	0
Biological	0	1	4	1
Ex Situ Containment	2	4	2	2

SCORING	**Feasibility**	**Effective**	**Practicality**	**Cost**
0	<90%	Concept	Not acceptable, very uncertain	$1,000/yd
1	90%	Bench		$100/yd
2	99%	Pilot		$10/yd
3	99.9%	Field		$1/yd
4	99.99%	Commercial	Acceptable, certain	<$1/yd

Table 15. Beneficial Effects of Remediation

Beneficial effect	Values quantifying these beneficial effects	Beneficial use affected
Lower toxicity in planktonic and benthic organisms	Greater survival of organisms in toxicity tests.	MAR, EST
Undegraded benthic community	Species diversity and abundance characteristic of undegraded conditions.	MAR, EST
Lower concentrations of pollutants in water	Water column chemical concentration that will not contribute to possible human health impacts.	MIGR, SPWN, EST, MAR, REC 1, REC 2
Lower concentrations of pollutants in fish and shellfish tissue	Lower tissue concentrations of chemicals that could contribute to possible human health and ecological impacts.	MAR, EST, REC 1, COMM
Area can be used for sport and commercial fishing.	Anglers catch more fish. Impact on catches and net revenues of fishing operations increase.	REC 1, COMM
Area can be used for shellfish harvesting or aquaculture	Jobs and production generated by these activities increase. Net revenues from these activities are enhanced.	SHELL, AQUA
Improved conditions for seabirds and other predators	Increase in populations. Value to public of more abundant wildlife.	WILD, MIGR, RARE
More abundant fish populations	Increase in populations. Value to public of more abundant wildlife.	MAR, EST
Commercial catches increase	Impact on catches and net revenues of fishing operations.	COMM
Recreational catches increase, more opportunities for angling	Increased catches and recreational visitor-days.	REC 1
Improved ecosystem conditions	Species diversity and abundance characteristic of undegraded conditions.	EST, MAR
Improved aesthetics	Value to public of improved aesthetics. In some cases, estimates of the value to the public of improved conditions may be available from surveys.	REC 2
More abundant wildlife, more opportunities for wildlife viewing	Impact on wildlife populations. Impact on recreational visitor-days.	MAR, WILD, RARE, REC 2

PREVENTION OF TOXIC HOT SPOTS

In the process of developing strategies to remediate ~~cleanup~~ toxic hot spots related to both sediment and water, the RWQCBs shall focus on approaches that rely on existing State and Federal programs to address identified toxic hot spots. In ~~revising Waste Discharge Requirements~~ addressing prevention activities for point and nonpoint sources of pollution, the RWQCBs shall:

1. Consider use of any established prevention tools such as (a) voluntary programs, (b) interactive cooperative programs, and (c) regulatory programs, individually or in any combination that will result in an effective toxic hot spot prevention strategy. The RWQCBs shall consider site-specific and pollutant-specific strategies to address the toxic hot spot including, but not limited to: pollution prevention audits, studies to specifically identify sources of pollutants, total maximum daily load development, watershed management approaches, pretreatment, recycle and reuse, revised effluent limitations, prohibitions, implementation of best management practices, etc.

2. Promote a watershed management protection approach focused on hydrologically defined areas (watersheds) rather than areas defined by political boundaries (counties, districts, municipalities), that take into account all waters, surface, ground, inland, and coastal and address point and nonpoint sources of pollution that may have influence or has been identified to have influenced the identified toxic hot spots. Link the cleanup plan to implementation of the Watershed Management Initiative and the SWRCB Strategic Plan.

3. Encourage the participation and input of, interdisciplinary groups of interested parties (including all potential dischargers) that are able to cross over geographical and political boundaries to develop effective solutions for preventing toxic hot spots.

4. Use prevention strategies that provide enough flexibility to be used as watershed protection plans where there are none

established or have the ability to join with a watershed protection plan that is already being implemented to address the toxic hot spot. Solutions developed shall also be developed for, and applied at sites where it will do the most prevention and where it will be the most cost-effective at mitigating and preventing toxic hot spots at a watershed level.

SITE-SPECIFIC VARIANCES

A site-specific variance to this Policy may be granted if an alternate approach for developing a cleanup plan for one or more sites within the jurisdiction of a RWQCB is needed. In all cases, when a RWQCB takes an alternate approach, the RWQCB shall provide the following information to the SWRCB prior to incorporation into the regional toxic hot spot cleanup plan:

1. A description of the provision not followed.

2. A description of the new approach used. The proposed alternative program, method, or process shall be clearly identified.

3. Any specific circumstances on which the RWQCB relied to justify the finding necessary for the variance.

4. Clear evidence that the alternative approach will better protect beneficial uses.

No variance from this Policy shall be effective unless approved by the SWRCB Executive Director.

ISSUES TO BE CONSIDERED IN THE DEVELOPMENT OF THE CONSOLIDATED TOXIC HOT SPOT CLEANUP PLAN

The SWRCB is required to develop a consolidated toxic hot spot cleanup plan. The regional toxic hot spot cleanup plans that are developed with this Policy will not become effective until the consolidated plan is completed. In developing the consolidated plan the SWRCB will consider several issues including, but not limited to:

1. Approaches for consolidating and compiling regional toxic hot spot cleanup plans.

2. Removing locations from and reevaluating the list of known toxic hot spots.

3. Guidance to the RWQCBs on considerations when reevaluating waste discharger requirements in compliance with Water Code Section 13395.

4. Findings concerning implementation of the plan and the need for establishment of a toxic hot spot cleanup program to fund remediation activities (consistent with Water Code Section 13394(i)).

TEMPLATE FOR PROPOSED REGIONAL TOXIC HOT SPOT CLEANUP PLANS

The regional toxic hot spot cleanup plan shall be formatted as presented below.

~~PROPOSED~~ REGIONAL TOXIC HOT SPOT CLEANUP PLAN

REGIONAL WATER QUALITY CONTROL BOARD
< > REGION

Part I

Part II

IV. Candidate Toxic Hot Spot List

Water body name	Segment Name	Site Identification	Reason for Listing	Pollutants present at the site.	Report reference

Reference list

V. Ranking Matrix (Pollutant Source has been deleted from the matrix.)

Water body Name	Site Identification	Human Health Impacts	Aquatic Life Impacts	Water Quality Objectives	Areal Extent	Remediation Potential	Overall Ranking

Part III

V. High Priority Candidate Toxic Hot Spot Characterization

For each high priority Candidate Toxic Hot Spot, the following information shall be presented:

A. An assessment of the areal extent of the THS.

B. An assessment of the most likely sources of pollutants (potential discharger).

C. A summary of actions that have been initiated by the Regional Boards to reduce the accumulation of pollutants at existing THSs and to prevent the creation of new THSs.

D. Preliminary Assessment of Actions required to remedy or restore a THS ~~to an unpolluted condition~~ including recommendations for remedial actions.

E. An estimate of the total cost and benefits of ~~to~~ implementing the cleanup plan.

F. An estimate of recoverable costs from potential dischargers.

G. A two-year expenditure schedule identifying funds to implement the plans that are not recoverable from potential dischargers.

FINAL FUNCTIONAL EQUIVALENT DOCUMENT

WATER QUALITY CONTROL POLICY FOR GUIDANCE ON THE DEVELOPMENT OF REGIONAL TOXIC HOT SPOT CLEANUP PLANS

INTRODUCTION

In 1989, The California State Legislature established the Bay Protection and Toxic Cleanup Program (BPTCP). The BPTCP has four major goals: (1) to provide protection of present and future beneficial uses of the bays and estuarine waters of California; (2) identify and characterize toxic hot spots; (3) plan for toxic hot spot cleanup or other remedial or mitigation actions; (4) develop prevention and control strategies for toxic pollutants that will prevent creation of new toxic hot spots or the perpetuation of existing toxic hot spots in the bays and estuaries of the State. Among other things, the BPTCP is required to develop Statewide and Regional Toxic Hot Spot Cleanup Plans and site ranking criteria.

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) will use a three phase process for adoption of the Regional and Statewide Toxic Hot Spot Cleanup Plans. The three phases are:

1. The SWRCB will adopt a policy outlining the toxic hot spot definition, ranking criteria and other factors needed for the consistent development of the BPTCP cleanup plans.

   The SWRCB will develop one document as formal guidance on the development of toxic hot spot cleanup plans. This document will be a Water Quality Control Policy (California Water Code Section 13140, 13142) that contains a specific definition of a toxic hot spot, ranking criteria to assist the SWRCB and the RWQCBs in establishing priorities for addressing toxic hot spots in the plans, and other measures necessary to facilitate the plans completion. The Policy will be accompanied by a functional equivalent document (FED) to facilitate California Environmental Quality Act (CEQA) and Administrative Procedure Act (APA) compliance and to provide technical justification to withstand peer review (as required by law).

For adoption of the Policy, the BPTCP will use the procedures for adopting and revising Water Quality Control Plans.

2. The RWQCBs will adopt the regional toxic hot spot cleanup plans.

   Each RWQCB completed proposed toxic hot spot cleanup plans by the January 1, 1998 deadline (RWQCB, 1997a; 1997b; 1997c; 1997d; 1997e; 1997f; 1997g). The RWQCBs will update, revise and finalize the proposed regional toxic hot spot cleanup plans.

   The RWQCBs will adopt the regional toxic hot spot cleanup plans using the normal procedures for a RWQCB action (i.e., the public will be given an opportunity to comment on the draft plan, the plan will be revised (if necessary) in response to the comments received, and the plan will be adopted by resolution of the RWQCB). The RWQCB need not adopt the plans pursuant to CEQA.

   After the regional plan is adopted, it will then be forwarded to the SWRCB for incorporation into the statewide consolidated plan. The regional cleanup plans will not be effective until approved by the SWRCB (and all CEQA and APA requirements are met).

3. The SWRCB will compile and adopt the consolidated toxic hot spot cleanup plan.

   The SWRCB will develop the Statewide cleanup plan. The Plan will consist of the consolidated list of toxic hot spots as well as the Water Code-mandated strategies for addressing the toxic hot spots. The SWRCB is required to make specific findings in the Statewide plan (Water Code Section 13394). The SWRCB will also develop a FED to facilitate CEQA and APA compliance and to provide technical justification to withstand peer review (as required by law). All CEQA review of the Regional actions will be completed at the SWRCB with the assistance of the RWQCB staff (e.g., assistance with response to comments, etc.).

   The SWRCB will use the same procedures used for adoption of the Policy in Phase 1 for adoption of the Statewide consolidated toxic hot spot cleanup plan.

The consolidated Statewide toxic hot spot cleanup plan will be submitted to the Legislature.

Purpose

The purpose of this Functional Equivalent Document (FED) is to present alternatives and SWRCB staff recommendations for the development of a Water Quality Control Policy to guide the Regional Water Quality Control Boards (RWQCBs) in the completion of the regional toxic hot spot cleanup plans. The topics addressed in the FED include: toxic hot spot definition, toxic hot spot ranking criteria, toxic hot spot cleanup planning (e.g., site characterization, source identification, remedial action alternatives, etc.) and toxic hot spot prevention (e.g., watershed management).

The SWRCB must comply with the requirements of CEQA and the APA when adopting a plan, policy or guideline. CEQA provides that a program of a State regulatory agency is exempt from the requirements for preparing Environmental Impact Reports (EIRs), Negative Declarations, and Initial Studies if certain conditions are met. The process the SWRCB is using to develop the Water Quality Control Policy for guidance on the development of regional toxic hot spot cleanup plans has received certification from the Resources Agency to be "functionally equivalent" to the CEQA process [Title 14 California Code of Regulations Section 15251(g)]. Therefore, this FED fulfills the requirements of CEQA for preparation of an environmental document.

The SWRCB has prepared a "program" environmental document for the proposed Policy because the Policy will be applied to sites throughout the State. This "program" approach is authorized by Title 14, California Code of Regulations (CEQA Guidelines) Section 15168(a) which provides that a program environmental impact report "may be prepared on a series of actions that can be characterized as one large project and are related ... (3) In connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways." Section 15168(b) of the CEQA Guidelines states that the advantages of using a program approach are to:

1. Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action,

2. Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis,

3. Avoid duplicative reconsideration of basic policy considerations,

4. Allow the Lead Agency to consider broad policy alternatives and program-wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts, and

5. Allow reduction in paperwork.

The "Discussion" section of the CEQA Guidelines that follows Section 15168 also supports this approach and states:

> "...The program EIR can be used effectively with a decision to carry out a new governmental program or to adopt a new body of regulations in a regulatory program. The program EIR enables the agency to examine the overall effects of the proposed course of action and to take steps to avoid unnecessary adverse environmental effects. This approach offers many possibilities for agencies to reduce their costs of CEQA compliance and still achieve high levels of environmental protection."

These sections of the CEQA Guidelines refer to Program EIRs. However, as part of a certified regulatory program, the proposed Policy is exempt from Chapter 3 of CEQA - the chapter that requires state agencies to prepare EIRs and Negative Declarations. (Resources Code Section 21080.5.) Agencies qualifying for this exemption must comply with CEQA's goals and policies, evaluate environmental impacts, consider cumulative impacts, consult with other agencies with jurisdiction by law, provide public notice and allow public review, respond to comments on the draft environmental document, adopt CEQA findings, and provide for monitoring of mitigation measures. SWRCB regulations (California Code of Regulations [CCR], Title 23, Chapter 27, Section 3777) require that a document prepared under its certified regulatory programs must include:

1. A brief description of the proposed activity;

2. Reasonable alternatives to the proposed activity; and

3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity.

Because a certified regulatory program is exempt from the requirement to prepare an EIR or Negative Declaration but must comply with other CEQA requirements, the SWRCB will prepare its functionally equivalent environmental document following CEQA guidelines for a "program" FED. The environmental impacts that may occur as a result of the development of the Policy are summarized in an Environmental Checklist and analyzed in the Environmental Impacts section of the FED.

The SWRCB held two public hearings on the draft FED (DWQ/SWRCB, 1998). The first hearing was held in Newport Beach on May 5, 1998 and the second hearing was held in Sacramento on May 11, 1998. The hearing record closed on May 15, 1998. The SWRCB has responded to the comments received and the responses are listed in the Response to Comment section of the final FED.

Background

California Water Code, Division 7, Chapter 5.6 established a comprehensive program within the SWRCB to protect the existing and future beneficial uses of California's enclosed bays and estuaries. SB 475 (1989), SB 1845 (1990), AB 41 (1989) and SB 1084 (1993) added Chapter 5.6 [Bay Protection and Toxic Cleanup (Water Code Sections 13390-13396.5)] to Division 7 of the Water Code.

The BPTCP has provided a new focus on the SWRCB and the Regional Water Quality Control Boards (RWQCBs) efforts to control pollution of the State's bays and estuaries by establishing a program to identify toxic hot spots and plan for their cleanup.

Program Activities

The BPTCP is a comprehensive effort by the SWRCB and RWQCBs to programmatically link standards development, environmental monitoring, water quality control planning, and site cleanup planning. The Program includes seven primary activities:

1. Development and amendment of the California Enclosed Bays and Estuaries Plan. This plan should contain the State's water quality objectives for enclosed bays and estuaries, and implementation measures for these objectives.

2. Development and implementation of regional monitoring programs designed to identify toxic hot spots. These monitoring programs include analysis for a variety of chemicals, toxicity tests, measurements of biological communities, and various special studies to support the Program.

3. Development of a consolidated database that contains information pertinent to describing and managing toxic hot spots.

4. Development of narrative and numeric sediment quality objectives for the protection of California enclosed bays and estuaries.

5. Preparation of criteria to rank toxic hot spots that are based on the severity of water and sediment quality impacts.

6. Development of Regional and Statewide Toxic Hot Spot Cleanup Plans that include identification and priority ranking of toxic hot spots, identification of pollutant sources, identification of actions already initiated, strategies for preventing formation of new toxic hot spots, and cost estimates for recommended remedial actions.

Toxic Hot Spot Identification

The Water Code defines toxic hot spots as locations in enclosed bays, estuaries, or the ocean where pollutants have accumulated in the water or sediment to levels which (1) may pose a hazard to aquatic life, wildlife, fisheries, or human health, or (2) may impact beneficial uses, or (3) exceed SWRCB or RWQCB-adopted water quality or sediment quality objectives.

To identify toxic hot spots, water bodies of interest have been assessed on both a regional and site-specific basis. Regional assessments require evaluating whether water quality objectives are attained and beneficial uses are supported throughout the water body. In the past, the State Mussel Watch program, independent

RWQCB studies, and other studies were used extensively to evaluate beneficial use impacts in many California enclosed bays and estuaries. The BPTCP efforts continue this work by focusing on measures of effects (such as toxicity) with the associated pollutants.

Generally, where sites were not well characterized, regional monitoring programs have been implemented. This monitoring activity has been performed by the Department of Fish and Game (DFG) under contract with the SWRCB. The consolidated statewide database required by the Water Code was planned to eventually include all data generated by the regional monitoring programs.

Ranking Criteria

The Water Code (Section 13393.5) requires the SWRCB to develop criteria for ranking toxic hot spots. The ranking criteria must consider the pertinent factors relating to public health and environmental quality. The factors include three considerations: (1) potential hazards to public health, (2) toxic hazards to fish, shellfish, and wildlife, and (3) the extent to which the deferral of a remedial action will result, or is likely to result, in a significant increase in environmental damage, health risks, or cleanup costs.

Sediment Quality Objectives

State law defines sediment quality objectives as "that level of a constituent in sediment which is established with an adequate margin of safety, for the reasonable protection of beneficial uses of water or prevention of nuisances" (Water Code Section 13391.5). Water Code Section 13393 further defines sediment quality objectives as: "...objectives...based on scientific information, including but not limited to chemical monitoring, bioassays or established modeling procedures." The Water Code requires "adequate protection for the most sensitive aquatic organisms." Sediment quality objectives can be either numerical values based on scientifically defensible methods or narrative descriptions implemented through toxicity testing or other methods.

Toxic Hot Spot Cleanup Plans

The Water Code requires that each RWQCB must complete a toxic hot spot cleanup plan and the SWRCB must prepare a statewide consolidated toxic hot spot cleanup plan.

Each cleanup plan must include: (1) a priority listing of all known toxic hot spots covered by the plan; (2) a description of each toxic hot spot including a characterization of the pollutants present at the site; (3) an assessment of the most likely source or sources of pollutants; (4) an estimate of the total costs to implement the cleanup plan; (5) an estimate of the costs that can be recovered from parties responsible for the discharge of pollutants that have accumulated in sediments; (6) a preliminary assessment of the actions required to remedy or restore a toxic hot spot; and (7) a two-year expenditure schedule identifying State funds needed to implement the plan.

Within 120 days from the ranking of a toxic hot spot in the consolidated cleanup plan, each RWQCB is required to begin reevaluating waste discharge requirements for dischargers who have contributed any or all of the pollutants which have caused the toxic hot spot. These reevaluations shall be used to revise water quality control plans wherever necessary. Reevaluations shall be initiated according to the priority ranking established in cleanup plans.

Program Organization

Three groups support or review the activities of the BPTCP: (1) the Monitoring and Surveillance Task Force, (2) the Scientific Planning and Review Committee, and (3) the BPTCP Advisory Committee. The functions of each of these groups follow:

1. *Monitoring and Surveillance Task Force (MSTF).* This committee was established to promote standard approaches for monitoring and assessing the quality of California's enclosed bays and estuaries [Section 13392.5(a)(1) of the Water Code]. While the primary focus of this committee has been on monitoring implementation, the committee has also developed and contributed to all other aspects of the Program including cleanup planning and ranking criteria development. The members of the task force are SWRCB, coastal RWQCBs, DFG and the Office of Environmental Health Hazard Assessment (OEHHA) staff.

2. *Scientific Planning and Review Committee (SPARC).* Although not legislatively mandated, SPARC brings together independent experts in the fields of toxicology, benthic ecology, organic and inorganic chemistry, program implementation and direction, experimental design, and

statistics to review the approaches taken by the BPTCP. The committee has provided comments on the Program's monitoring approach(es), given input on the scientific merit of the approach(es) taken, and provided suggestions for monitoring improvement.

3. *BPTCP Advisory Committee.* This committee was established to assist the SWRCB in the implementation of the BPTCP (Section 13394.6(a) of the Water Code). The major purpose of the committee is to review the Program activities and provide its views on how the products of the BPTCP should be interpreted and used. The committee has members from (a) trade associations; (b) fee-paying dischargers; and (c) environmental, public interest, public health and wildlife conservation organizations.

Legislative Deadlines

The BPTCP is required to complete several tasks using deadlines established in the Water Code (Table 1).

TABLE 1: WATER CODE-MANDATED DEADLINES FOR THE BPTCP

Activities	Deadline
Sediment Quality Objectives Workplan	July 1, 1991
Consolidated Database	January 30, 1994
Ranking Criteria	January 30, 1994[1]
Progress Report	January 1, 1996
Regional Toxic Hot Spot Cleanup Plans	January 1, 1998
Statewide Toxic Hot Spot Cleanup Plan	June 30, 1999

[1]This deadline was not met. The SWRCB requested an extension until February 28, 1995. The BPTCP completed a draft ranking criteria by the February deadline; however, the BPTCP Advisory Committee requested that the deadline be further extended so discussions on very controversial topics could be concluded.

Scope of FED

The FED was developed with a consideration of: existing State statute, regulations, and policies; the current approaches of the RWQCBs; and the recommendations of the BPTCP Advisory Committee and Scientific Planning and Review Committee.

The final FED contains eight major sections: Introduction, Project Description, Environmental Setting, Issue Analysis, Environmental Effects of the Proposed Policy, Environmental Checklist, Comments and Responses, and References.

PROJECT DESCRIPTION

Project Definition

The project is a Statewide Water Quality Control Policy that includes provisions for:

1. A specific definition of a toxic hot spot
2. Criteria to rank sites
3. Mandatory requirements for Regional Toxic Hot Spot Cleanup Plan
4. Remediation actions and costs
5. Toxic Hot Spot prevention strategies
6. Issues to be considered in the development of the Statewide Toxic Hot Spot Cleanup Plan
7. Site-specific variances from the Policy

The proposed Policy is applicable to the surface waters of California in Regions 1, 2, 3, 4, 5 , 8, and 9. Figure 1 is a map of this area.

Statement Of Goals

The SWRCB's goals for this project are to:

1. Provide more consistent statewide approaches for identification of toxic hot spots;
2. Provide approaches to address the identified toxic hot spots; and
3. Provide methods to assist the RWQCBs attain the highest water quality that is reasonable and protect the quality of the coastal waters in the State from degradation.

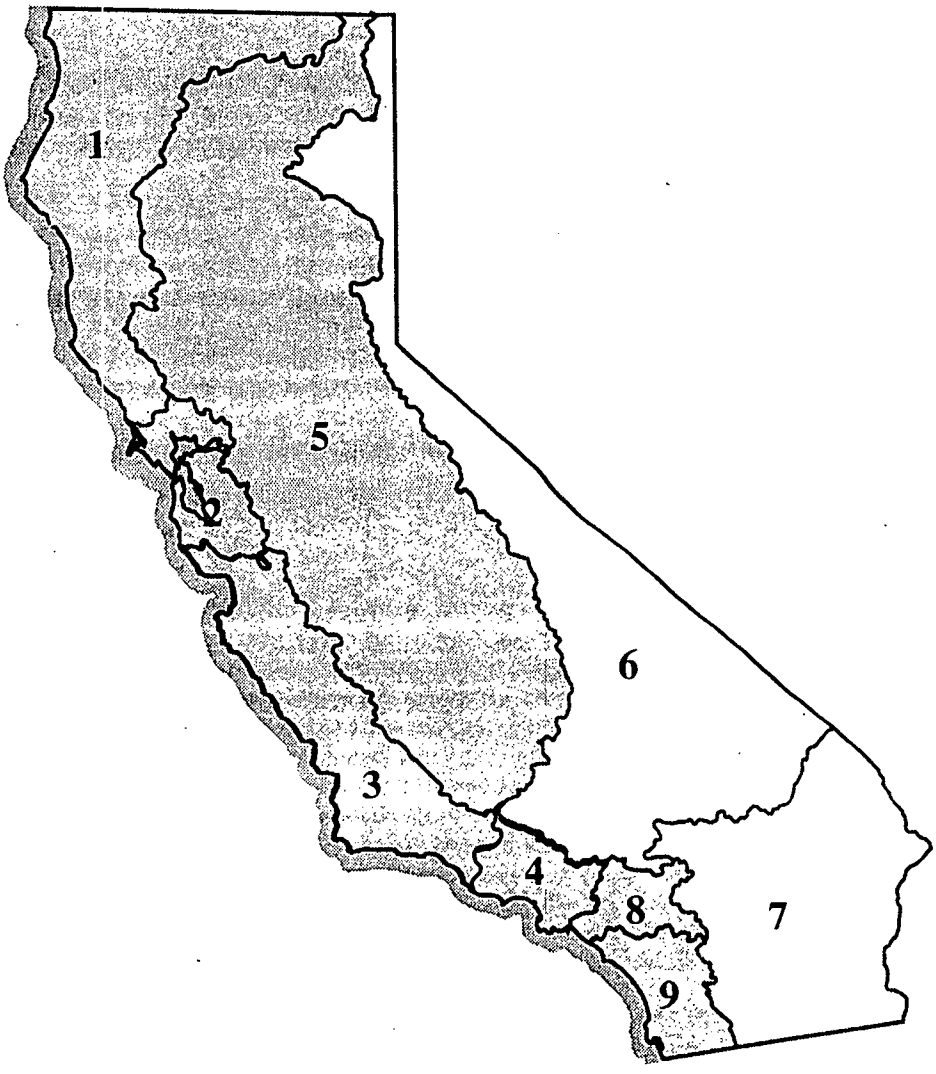

FIGURE 1: AREA THAT THE POLICY IS APPLICABLE.

Proposed Action

The proposed action is SWRCB adoption of the proposed Water Quality Control Policy outlined in the Project Definition (above).

The proposed Policy is being developed as a part of a phased approach to development of a Statewide Consolidated Toxic Hot Spot Cleanup Plan. (This phased approach and components of a Water Quality Control Policy are also explained in the Introduction to this FED and Issue 1.) Under Phase 1 of development of the consolidated cleanup plan, the SWRCB will issue a Policy that provides specific guidance on the development of regional toxic hot spot cleanup plans.

In Phase 2, the RWQCBs will develop and adopt Regional Toxic Hot Spot Cleanup Plans pursuant to the Policy. Phase 3 will be the formal development of the Statewide Toxic Hot Spot Cleanup Plan by the SWRCB. The SWRCB will compile the regional cleanup plans, make additional findings as required by the California Water Code and, after compliance with CEQA and the APA, submit the consolidated Statewide plan to the California Legislature.

ENVIRONMENTAL SETTING

California presents a variety of environmental conditions ranging from snow-covered peaks of the Sierra Nevada, to hot dry deserts (with a huge variation in between these two extremes) to the Pacific Ocean, one of the world's most scenic coastlines.

For water quality management, Section 13200 of the Porter-Cologne Water Quality Control Act (Porter-Cologne) divides the State into nine different hydrologic regions. The activities of the BPTCP are focused on the Regions that border coastal waters including the Sacramento-San Joaquin River Delta. Brief descriptions of the Regions and the water bodies addressed by this FED are presented below. The sources of the information provided in this section are the RWQCB basin plans, proposed regional toxic hot spot cleanup plans (RWQCB, 1997a; 1997b; 1997c; 1997d; 1997e; 1997f; 1997g), and status reports on the BPTCP (SWRCB, 1993; 1996).

North Coast Region (Region 1)

The North Coast Region is defined in Section 13200(a) of Porter-Cologne as follows: North Coast region, which comprises all basins including Lower Klamath Lake and Lost River Basins draining into the Pacific Ocean from the California-Oregon state line southerly to the southerly boundary of the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties.

The North Coast Region is divided into two natural drainage basins, the Klamath River Basin and the North Coastal Basin. The North Coast Region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Glenn, Lake, and Marin Counties.

The North Coast Region encompasses a total area of approximately 19,390 square miles, including 340 miles of scenic coastline and remote wilderness areas, as well as urbanized and agricultural areas.

The North Coast Region is characterized by distinct temperature zones. Along the coast, the climate is moderate and foggy and the temperature variation is not great. For example, at Eureka, the seasonal variation in temperature has not exceeded 63° F for the

period of record. Inland, however, seasonal temperature ranges in excess of 100°F have been recorded.

Precipitation over the North Coast Region is greater than for any other part of California, and damaging floods are a fairly frequent hazard. Particularly devastating floods occurred in the North Coast area in December of 1955, in December of 1964, and in February of 1986.

Ample precipitation in combination with the mild climate found over most of the North Coast Region has provided a wealth of fish, wildlife, and scenic resources. The mountainous nature of the Region, with its dense coniferous forests interspersed with grassy or chaparral covered slopes, provides shelter and food for deer, elk, bear, mountain lion, furbearers and many upland bird and mammal species. The numerous streams and rivers of the Region contain anadromous fish, and the reservoirs, although few in number, support both coldwater and warmwater fish.

Tidelands, and marshes too, are extremely important to many species of waterfowl and shore birds, both for feeding and nesting. Cultivated land and pasture lands also provide supplemental food for many birds, including small pheasant populations. Tideland areas along the north coast provide important habitat for marine invertebrates and nursery areas for forage fish, game fish, and crustaceans. Offshore coastal rocks are used by many species of seabirds as nesting areas.

Major components of the economy are tourism and recreation, logging and timber milling, aggregate mining, commercial and sport fisheries, sheep, beef and dairy production, and vineyards and some wineries.

In all, the North Coast Region offers a beautiful natural environment with opportunities for scientific study and research, recreation, sport and commerce.

Approximately two percent of the total population of California reside in the North Coast Region. The largest urban centers are located in the Eureka area of Humboldt county and in the Santa Rosa area of Sonoma county, which has experienced the highest population change of all the counties. The major industries of the region are logging and timber milling/production, vineyards and

some wineries. The area is also home to many wood product manufacturing facilities, including pulp mills.

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

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997a).

San Francisco Region (Region 2)

Section 13200(b) of the Porter-Cologne Act defines the San Francisco Bay Region as that which comprises San Francisco Bay, Suisun Bay, from Sacramento River and San Joaquin River westerly from a line which passes between Collinsville and Montezuma Island and follows thence the boundary common to Sacramento and Solano counties and that common to Sacramento and Contra Costa counties to the westerly boundaries of the watershed of Markely Canyon in Contra Costa county, all basins draining into the bays and rivers westerly from this line, and all basins draining into the Pacific Ocean between the southerly boundary of the north coastal region and the southerly boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz counties.

The San Francisco Bay Region is comprised of most of the San Francisco Estuary up to the mouth of the Sacramento-San Joaquin Delta. The San Francisco estuary conveys the waters of the Sacramento and San Joaquin rivers into the Pacific Ocean. Located on the central coast of California, the Bay system functions as the only drainage outlet for waters of the Central Valley. It also marks a natural topographic separation between the

northern and southern coastal mountain ranges. The region's waterways, wetlands and bays form the centerpiece of the fourth largest metropolitan area in the United States, including all or major portions of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma counties.

The San Francisco Bay RWQCB has jurisdiction over the part of the San Francisco estuary which includes all of the San Francisco Bay segments extending east to the Delta (Winter Island near Pittsburg). Coastal embayments including Tomales Bay and Bolinas Lagoon are also located in this Region. The Central Valley RWQCB has jurisdiction over the Delta and rivers extending further eastward.

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

The San Francisco estuary is made up of many different types of aquatic habitats that support a great diversity of organisms. Suisun Marsh in Suisun Bay is the largest brackish-water marsh in the United States. San Pablo Bay is a shallow embayment strongly influenced by runoff from the Sacramento and San Joaquin Rivers. The Central Bay is the portion of the Bay most influenced by oceanic conditions. The South Bay, with less freshwater inflow than the other portions of the Bay, acts more like a tidal lagoon. Together these areas sustain rich communities of aquatic life and serve as important wintering sites for migrating waterfowl and spawning areas for anadromous fish.

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997b).

Central Coast Region (Region 3)

The Central Coast Region is described by Porter Cologne Section 13200(c) as comprising all basins, including Carrizo Plain in San Luis Obispo and Kern counties, draining into the Pacific Ocean

from the southerly boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz counties to the south easterly boundary, located in the westerly part of Ventura county, of the watershed of Rincon Creek.

The Central Coast Regional Board has jurisdiction over a 300-mile long by 40-mile wide section of the State's central coast. Its geographic area encompasses all of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara Counties as well as the southern one-third of Santa Clara County, and small portions of San Mateo, Kern, and Ventura Counties. Included in the region are urban areas such as the Monterey Peninsula and the Santa Barbara coastal plain; prime agricultural lands as the Salinas, Santa Maria, and Lompoc Valleys; National Forest lands, extremely wet areas like the Santa Cruz mountains; and arid areas like the Carrizo Plain.

Historically, the economic and cultural activities in the basin have been agrarian. Livestock grazing persists, but it has been combined with hay cultivation in the valleys. Irrigation, with pumped local ground water, is very significant in intermountain valleys throughout the basin. Mild winters result in long growing seasons and continuous cultivation of many vegetable crops in parts of the basin.

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

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

Water bodies on the central coast are varied. Enclosed bays and harbors in the Region include Morro Bay, Elkhorn Slough,

Tembladero Slough, Santa Cruz harbor, Moss Landing Harbor, San Luis Harbor, and Santa Barbara Harbor. The Region also is characterized by several small estuaries including the Santa Maria River estuary, San Lorenzo River estuary, Big Sur River estuary, and many others.

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997c).

Los Angeles Region (Region 4)

Los Angeles Region is described by Porter Cologne, Section 13200(d) to comprise all basins draining into the Pacific Ocean between the southeasterly boundary, located in the westerly part of Ventura County, of the watershed of Rincon Creek and a line which coincides with the southeasterly boundary of Los Angeles county from the ocean to San Antonio Peak and follows thence the divide between the San Gabriel River and Lytle Creek drainages to the divide between Sheep Creek and San Gabriel River drainages.

The Los Angeles Region encompasses all coastal drainages flowing to the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina and San Clemente). In addition, the Region includes all coastal waters within three miles of the continental and island coastlines.

The Region contains two large deepwater harbors (Los Angeles and Long Beach Harbors) and one smaller deepwater harbor (Port Hueneme). There are small craft marinas within the harbors, as well as tank farms, naval facilities, fish processing plants, boatyards, and container terminals. Several small-craft marinas also occur along the coast (e.g., Marina del Rey, King Harbor, Ventura Harbor); these contain boatyards, other small businesses and dense residential development.

Several large, primarily concrete-lined rivers (e.g., Los Angeles River, San Gabriel River) lead to unlined tidal prisms which are influenced by marine waters. Salinity may be greatly reduced following rains since these rivers drain large urban areas composed of mostly impermeable surfaces. Some of these tidal prisms receive a considerable amount of freshwater throughout the year from publicly-owned treatment plants discharging tertiary-treated

effluent. Lagoons are located at the mouths of other rivers draining relatively undeveloped areas (e.g., Mugu Lagoon, Malibu Lagoon, Ventura River Estuary, Santa Clara River estuary). There are also a few isolated coastal brackish water bodies receiving runoff from agricultural or residential areas.

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

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997d).

Central Valley Region (Region 5)

Section 13200(g) of the Porter Cologne earmarks the Central Valley Region as comprising all basins including Goose Lake Basin draining into the Sacramento and San Joaquin Rivers to the easterly boundary of the San Francisco Bay Region near Collinsville. The Central Valley Region has offices in the Sacramento Valley and the San Joaquin Valley.

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

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

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997e).

Santa Ana Region (Region 8)

The Santa Ana Region is described by Porter Cologne Section 13200(e) as comprising all basins draining into the Pacific Ocean between the southerly boundary of Los Angeles Region and a line which follows the drainage divide between Muddy and Moro Canyons from the ocean to the summit of San Joaquin Hills; thence along the divide between lands draining into Newport Bay and into Laguna Canyon to Niguel Road; thence along Niguel Road and Los Aliso Avenue to the divide between Newport Bay and Aliso Creek drainages; thence along the divide and the southeasterly boundary of the Santa Ana River drainage to the divide between Baldwin Lake and Mojave Desert drainages; thence along that divide to the divide between the Pacific Ocean and Mojave Desert drainages.

The Santa Ana Region is the smallest of the nine regions in the state (2800 square miles) and is located in southern California, roughly between Los Angeles and San Diego. Although small geographically, the region's four-plus million residents (1993 estimate) make it one of the most densely populated regions.

The climate of the Santa Ana Region is classified as Mediterranean: generally dry in the summer with mild, wet winters. The average annual rainfall in the region is about fifteen inches, most of it occurring between November and March.

The enclosed bays in the Region include Newport Bay, Bolsa Bay (including Bolsa Chica Marsh), and Anaheim Bay.

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997f).

San Diego Region (Region 9)

The San Diego Region is described by Porter Cologne Section 13200(f) as comprising all basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary.

The San Diego Region is located along the coast of the Pacific Ocean from the Mexican border to north of Laguna Beach. The Region is rectangular in shape and extends approximately 80 miles along the coastline and 40 miles east to the crest of the mountains. The Region includes portions of San Diego, Orange, and Riverside Counties.

The population of the Region is heavily concentrated along the coastal strip. Six deep water sewage outfalls and one across the beach discharge from the new border plant at the Tijuana River empty into the ocean. Two harbors, Mission Bay and San Diego Bay, support major recreational and commercial boat traffic. Coastal lagoons are found along the San Diego County coast at the mouths of creeks and rivers.

Weather patterns are Mediterranean in nature with an average rainfall of approximately ten inches per year occurring along the coast. Almost all the rainfall occurs during wet cool winters. The Pacific ocean generally has cool water temperatures due to upwelling. This nutrient-rich water supports coastal beds of giant kelp.

The cities of San Diego, National City, Chula Vista, Coronado, and Imperial Beach surround San Diego Bay in the southern portion of the Region. The Bay is long and narrow, 15 miles in length and approximately one mile across. A deep-water harbor, San Diego Bay has experienced waste discharge from former sewage outfalls, industries, and urban runoff. Up to 9,000 vessels may be moored in the Bay. San Diego Bay also hosts four major U.S. Navy bases with approximately 80 surface ships and submarines.

Coastal waters include bays, harbors, estuaries, beaches, and open ocean. Deep draft commercial harbors include San Diego Bay and Oceanside Harbor and shallower harbors include Mission Bay and Dana Point Harbor. Tijuana Estuary, Sweetwater Marsh, San Diego River Flood Control Channel, Kendal-Frost wildlife reserve, San Dieguito River Estuary, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, San Luis Rey

Estuary, and Santa Margarita River Estuary are the important estuaries of the region.

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

The areas of concern and a proposed list of candidate toxic hot spots are presented in the proposed regional toxic hot spot cleanup plan (RWQCB, 1997g).

ISSUE ANALYSIS

The staff analysis of each issue addressed during the development of the Water Quality Control Policy is formatted consistently to provide the SWRCB with a summary of the topic or issue as well as alternatives for their action. All comments received and the responses are presented in a separate section after the Environmental Checklist.

Each issue analysis contains the following sections:

Issue:	A brief description of the issue or topic.
Present Policy:	A summary of any existing Statewide SWRCB policy related to the issue or topic.
Issue Description:	A more complete description of the issue or topic plus (if appropriate) any additional background information, list of limitations and assumptions, and descriptions of related programs.
Alternatives:	For each issue or topic, at least two alternatives are provided for SWRCB consideration.
Staff Recommendation:	In this section, a suggestion is made for which alternative should be adopted by the SWRCB.

Issue 1: ***Authority and Reference for Guidance on Developing Toxic Hot Spot Cleanup Plans***

Present Policy: None.

Issue Description: In order to be developed fairly and consistently, the Statewide and Regional THS cleanup plans should be developed and implemented consistent with existing Plans and Policies of the SWRCB and RWQCBs. The only way to ensure consistency is for the SWRCB to require the conformance of the plan development to a set of guidelines. If the guidance is mandatory then the SWRCB must adopt the guidance (e.g., a Statewide Plan or Policy) in accordance with the requirements of CEQA and the APA.

The SWRCB should consider the format of the guidance it will issue to the RWQCBs.

Alternatives:

1. <u>The SWRCB should consider incorporating the guidance for developing toxic hot spot cleanup plans into a Statewide Water Quality Control Plan.</u>

The SWRCB is required to adopt a Water Quality Control Plan for the Enclosed Bays and Estuaries of California (Water Code Section 13391). This plan was first adopted in 1991 and was subsequently amended in 1992. The Plan contained requirements for beneficial use designations, water quality objectives, guidance on development of site-specific water quality objectives, a program of implementation, and other regulatory provisions.

In 1994, the EBE Plan was nullified by the California Superior Court. The SWRCB is currently developing the Enclosed Bays and Estuaries Plan in two phases. The first phase is for the SWRCB to adopt a Policy for the Implementation of the California Toxics Rule (SWRCB, 1997b). Even though the Plan could be modified to contain BPTCP guidance, the EBE Plan redevelopment schedule would not allow the BPTCP to meet the Water Code-mandated deadline for adoption of the Statewide consolidated cleanup plan. This alternative would not allow the SWRCB and RWQCBs to meet the legislatively mandated deadlines.

2. <u>The SWRCB should adopt a stand-alone Policy for guidance on developing cleanup plans. The SWRCB should adopt</u>

language that identifies the statutory authority to adopt a Policy, where the Policy applies, and variance provisions.

The SWRCB has the authority to adopt Policy for Water Quality Control (please refer to Sections 13140 and 13142 of the Water Code). Section 13142 states in part:

> "State policy for water quality control shall consist of all or any of the following: (a) Water quality principles and guidelines for long-range planning, including ground water or surface water management programs and control and use of reclaimed water. (b) Water quality at key locations for planning...and for water quality control activities. (c) Other principles deemed essential by the state board for water quality control...."

Implementation of a clearly worded Policy with limited flexibility in interpretation would ensure consistent development of the toxic hot spot cleanup plans on a Statewide basis. However, if the Policy is too specific it may preclude site-specific circumstances encountered by the RWQCBs. If a Policy is developed, it should allow for site-specific variances similar to the exception process in the California Ocean Plan (1997a) or site-specific variances allowed pursuant to the California Underground Storage Tank Regulations (Title 23, Article 8, CCR Sections 2680 through 2681).

3. The State Water Board should not adopt any formal guidance to implement the BPTCP.

This alternative provides the most flexibility of any of the alternatives presented. This flexibility is advantageous with the variety of conditions that will be encountered by the RWQCBs. However, it is also likely that the Regional Toxic Hot Spot Cleanup Plans developed without specific guidance could be completed with widely varying interpretations of the toxic hot spot definition and ranking criteria, have variable formats, incomplete consideration of remediation alternatives, among other problems due to varying interpretations of the Water Code (Sections 13390 et seq.). This would make the task of developing the consolidated Statewide cleanup plan more difficult.

Staff Recommendation: Adopt Alternative 2.
Please refer to page "xlviii" of the proposed Water Quality Control Policy for the variance provisions.

Issue 2: ***Toxic Hot Spot Definition***

Present Policy: None.

Issue Description: One of the fundamental tasks of the BPTCP is the identification of toxic hot spots. The SWRCB needs to consider whether a specific definition of toxic hot spots is warranted. The issue is: Should the SWRCB implement a general definition of a toxic hot spot or should another definition that is more focused be used?

Background

Section 13391.5 of the Water Code defines toxic hot spots as "...locations in enclosed bays, estuaries, or adjacent waters in the 'contiguous zone' or the 'ocean' as defined in Section 502 of the Clean Water Act (33. U.S.C. Section 1362), the pollution or contamination of which affects the interests of the State, and where hazardous substances have accumulated in the water or sediment to levels which (1) may pose a substantial present or potential hazard to aquatic life, wildlife, fisheries, or human health, or (2) may adversely affect the beneficial uses of the bay, estuary, or ocean waters as defined in the water quality control plans, or (3) exceeds adopted water quality or sediment quality objectives."

Identification of toxic hot spots is a critical first step in the assessment, cleanup or remediation of polluted sites in California's enclosed bays and estuaries. To assist the SWRCB and RWQCBs staff, the SWRCB sponsored a technical workshop in February, 1991 in an effort to determine the criteria necessary to develop a Sediment Quality Assessment Strategy (Lorenzato et al., 1991). The workshop was attended by more than twenty scientific experts in sediment quality assessment from around the country, as well as observers from state and federal agencies, discharger organizations, and environmental groups. The participants' recommended higher and lower priorities for criteria that an ideal sediment quality assessment strategy should meet. These criteria are presented in Table 2.

Toxic Hot Spot Definition Considerations

One of the most important views expressed by the sediment quality assessment workshop participants was the adoption of a weight-of-evidence approach for the evaluation of sediment quality assessment information. A weight-of-evidence approach relies on a comprehensive judgment of chemical, physical, biological, toxicological, and modeling information to draw conclusions

regarding the effects of pollutants on biological resources and human health. In order to implement this approach it is necessary for the toxic hot spot definition to include assessment of biological response as well as analysis of the chemical contamination of various media.

These measures can focus on several levels of biological organization from organism to community, from single celled organisms to the highest order predators. Any of these measures taken singly can provide limited insight into the quality of the estuarine or bay environment. When used together they will provide a much more comprehensive characterization of the environment of interest than any one measure used alone.

In 1995 and 1996, the BPTCP Scientific Planning and Review Committee reviewed the monitoring activities of the BPTCP (SPARC, 1997). The committee made several comments on the definition that were incorporated into the most current version included in this FED. The SPARC considered the monitoring activities scientifically defensible.

There are other programmatic and regulatory elements that also need to be considered in the development of a specific toxic hot spot definition, and include:

1. The definition must be able to distinguish between sites with either significant or little information on environmental impacts of toxic pollutants.

TABLE 2: PRIORITIZED CRITERIA RECOMMENDED FOR A SEDIMENT QUALITY ASSESSMENT STRATEGY. [1]

Higher Priority
Differentiate between effects due to toxic substances and changes due to natural factors (describe the significant variability of exposure and response, including identification of major sources of variability).
Be of broad and local ecological relevance.
Detect the effects on biota from long-term exposures.
Consider the bioavailability, exposure potential, and/or bioaccumulation of toxic agents.
Be a tiered approach that utilizes multiple assessment tools and/or approaches, including a first tier that is rapid, sensitive, and overprotective.
Use of a suite of appropriate sensitive species.
Identify agent(s) causing toxicity in the field.
Clearly identify range above which impairment occurs and below which no impairment is predicted.
Identify and quantify potentially toxic agent(s).
Include a mechanism to evaluate efficacy and incorporate improvements.
Be scientifically defensible.

Lower Priority
Detect effects on biota from short-term exposures.
Be clearly described.
Specify the degree of certainty of protection which will be attained for sensitive organisms.
Be of low or moderate cost.[2]

[1] Priorities assigned based on information presented at the State Water Resources Control Board sponsored Sediment Quality Assessment Workshop held in February 1991.

[2] Costs were de-emphasized in an effort to define the most technically appropriate assessment approach. Cost limitations are to be considered by the SWRCB as part of its ongoing program management.

2. The definition must be testable using interpretable scientific procedures (i.e., either indicators of stress or actual measurements of impacts on beneficial uses).

3. The definition should be usable with existing monitoring information as well as with any new monitoring information that may become available.

4. Biological response(s) of organisms is of greater importance than chemical measurement alone.

5. Biological response should be associated with the presence of non-naturally-occurring toxic pollutants (association of biological response with exposure to other physical or chemical agents alone, e.g., hydrogen sulfide (H_2S), grain size, total organic carbon (TOC), etc., is not sufficient to identify a toxic hot spot).

6. Actual loss of beneficial use is not necessary to designate a site as a toxic hot spot (i.e., indicators of pollutant effects are sufficient for the designation).

7. The very general term "interests of the State" is defined as the public health and welfare of the people of California. This definition includes protection of the environment, costs of remediation, and benefits of remediation.

Alternatives:

1. Allow Regional Water Boards to apply only the statutory definition of toxic hot spot provided in Section 13391.5 of the Water Code.

The statutory definition of a toxic hot spot gives the RWQCBs significant latitude in considering which locations in the State are considered toxic hot spots. Using this definition would give the same "toxic hot spot" designation to sites with little information available and sites that are well studied. The RWQCBs would then be required to develop a cleanup plan that planned for the remediation or further prevention of toxic pollutants at these sites.

The statutory definition of a toxic hot spot is quite general, and could be subject to an interpretation that would allow large portions (if not all) of California's coastline, including enclosed bays and estuaries, to be designated as toxic hot spots. A very

broad interpretation would not help the SWRCB and RWQCBs in planning for the cleanup or remediation of toxic hot spots because it would be difficult to focus efforts where regulatory response is needed most. It is very unclear how many toxic hot spots would be identified using the statutory definition. Conceivably, every water body that has been previously sampled could be designated as a toxic hot spot.

2. Apply a more specific definition of a toxic hot spot that is consistent with the intent of Section 13391.5 of the Water Code.

One of the most critical steps in the development of toxic hot spot cleanup plans is the identification of hot spots. Once they are identified the parties responsible for the sites could be liable for the cleanup of the site or further prevention of the discharges or activities that caused the toxic hot spot. The SWRCB should consider that before a site is listed as a known toxic hot spot (i.e., before the SWRCB has formally adopted the consolidated cleanup plan), the site should be considered a Candidate Toxic Hot Spot. If a candidate toxic hot spot is adopted by a RWQCB and subsequently by the SWRCB in the consolidated toxic hot spot cleanup plan then the toxic hot spot becomes a known toxic hot spot. This then triggers the requirement for the RWQCBs to reevaluate WDRs for the known toxic hot spot (Water Code Section 13395).

The specific definition of a toxic hot spot that follows combines consideration of statutory definition of a toxic hot spot, sediment quality assessment criteria from the SWRCB 1991 workshop, programmatic and regulatory criteria, SPARC review, and tools currently available to identify toxic hot spots.

Proposed Specific Definition

The proposed specific definition of a toxic hot spot is presented in the draft Water Quality Control Policy. Please refer to pages "xx" through "xxiii" for the complete text of the definition.

Rationale for the Specific Definition

Under this alternative, the definition of a toxic hot spot is separated into two parts: candidate and known, based on whether the RWQCBs and SWRCB have adopted cleanup plans identifying the site as a known toxic hot spot. A site should be considered a candidate toxic hot spot if it exhibits significant toxicity, high

levels of bioaccumulation, impairment of resident organisms, degradation of biological resources, or water or sediment quality objectives are exceeded.

Sites that are not well characterized (i.e., insufficient data to designate as a candidate toxic hot spot) shall be characterized as areas of concern. Any site designated as an area of concern will be a candidate for further monitoring to confirm preliminary indications of the site impairments.

Human Health

Toxic hot spots can be caused by pollutants that have the potential to cause impacts on human health. In California, if a fish advisory has been issued (by OEHHA or the California Department of Health Services) for a water body then it is acknowledged that the beneficial use for that water to protect human health via seafood consumption is impaired (i.e., the beneficial use has been lost because the public has been warned that fish tissue concentrations are high enough to be potentially harmful to human health). Several agencies (e.g., Office of Environmental Health Hazard Assessment and the Food and Drug Administration) have also published chemical specific values for tissue concentrations that are intended to protect human health (FDA, 1984; OEHHA, 1991; EPA, 1993f). These values are extremely useful in assessing the quality of fish or other organism tissue for consumption. When used carefully and consistently these considerations can assist in identifying locations where human health may be impacted.

Biological Indicators of Pollutant Effects

There is presently no single method, test, or procedure capable of adequately characterizing the many and varied adverse biological effects and ecological impacts contaminated sediments may cause. The most appropriate and scientifically defensible approach currently available appears to be choosing not one, but an array of tests that determine multiple endpoints using a number of individual species or ecological assemblages, and that can also assess various routes of exposure.

Toxicity Testing

The use of a number of different organisms ensures a greater opportunity to identify problematic conditions than reliance on a single organism. Toxicity can be assessed in relation to either complex mixtures or individual substances; it can also be evaluated on the basis of acute or chronic exposures in test systems. The

determination of an array of toxicity testing endpoints ranging from lethality, through critical life stages, will allow the evaluation of a variety of effects.

Several species have been tested for acute toxicity to bedded (as opposed to suspended) sediment samples. For saline and brackish waters, tests for amphipods are well developed and widely used as acute, lethal tests (e.g., ASTM, 1993; De Witt et al., 1989; Nebecker et al., 1984). These amphipods have been used on field samples and laboratory spiked sediments. Chronic exposures have been tested with the polychaete Neanthes (Johns et al., 1990). Growth of the polychaete is measured in a 20-day exposure. Reduction in growth over this period has been shown to predict adverse effects on reproduction.

Direct measurement of reproductive effects is another means of characterizing biological impairment. Several tests developed for the measurement of adverse reproductive effects arising from exposure to polluted water have been adapted to characterize potential problem sediments. Most of these tests require the preparation of an elutriate (the mixing of sediment with water, subsequent settling, and then testing in the water separated from the settled sediments) (e.g., ASTM, 1987).

Interpretation of Toxicity Data

In the proposed toxic hot spot definition, toxicity data is assessed relative to a reference envelope that includes all sources of laboratory and field variation affecting toxicity test results. In the absence of a calculated reference envelope the toxicity data are compared to laboratory controls.

The reference envelope includes results from all reference sites in a particular area, past and present. The reference envelope approach has been used to determine whether the level of toxicity exceeds the lower confidence interval of the reference envelope. As more reference site toxicity results become available more will be known on the range of organism responses found within a reference site condition. This will provide a better tool for determining differences between the toxicity response at reference sites relative to the level of toxicity responses at impacted sites.

A "reference envelope" statistical approach has been employed (Smith, 1995; Fairey et al., 1996; Hunt et al., 1998) to identify

samples that exhibit significantly greater toxicity than expected in a waterbody as a whole.

The reference envelope approach uses data from "reference sites" to characterize the response expected from sites in the absence of localized pollution. Using data from the reference site population, a tolerance limit is calculated for comparison with data from test sites. Samples with toxicity values greater than the tolerance limit are considered toxic relative to the ambient condition of the waterbody.

This relative standard established using reference sites is conceptually different from what might be termed the absolute standard of test organism response in laboratory controls. Rather than comparing sample data to characterize the variance component, the reference envelope approach compares sample data against a percentile of the reference population of data values, using variation among reference sites as the variance component (Figure 2). The reference envelope variance component, therefore, included variation among laboratory replicates, among field replicates, among sites, and among sampling events.

The reference stations are assumed to be a random sample from an underlying population of reference locations that serve as a standard for what we considered relatively non-impacted conditions (i.e., the reference sites support an undegraded benthic community and has relatively low toxic chemical concentrations). The toxicity measured at different reference locations will vary due to the different local conditions that can affect the toxicity results. In order to determine whether sediments from a test location are toxic, bioassay results for the test location are compared with bioassay results from the population of reference locations.

Assuming the bioassay results from the population of reference locations are normally distributed, an estimate of the probability that the test sediment is from the underlying reference station distribution can be made. For example, if the result for a test sediment was at the first percentile of the underlying reference location distribution (in the direction of toxicity), then there would be about a 1 percent chance that the test sediment was from the distribution of reference locations.

The toxicity level at the first percentile of the reference distribution is not known because there were only limited samples from the

underlying distribution and only an estimate could be made of where the first percentile lies. If an estimate of the first percentile value was made a large number of times, using different random samples from the reference distribution, a (non-central t) distribution of estimates, with the distribution mode at the actual first percentile would be obtained (Figure 2). In Figure 2, from the distribution of estimates about one half of the time the estimate from the sample was above the actual first percentile. Ideally, identification of an estimated toxicity value would cover the actual first percentile for a large percentage of the estimates (say 95 percent of the time). Such a value can be obtained from the left tail of the distribution of estimates where 5 percent of the estimates

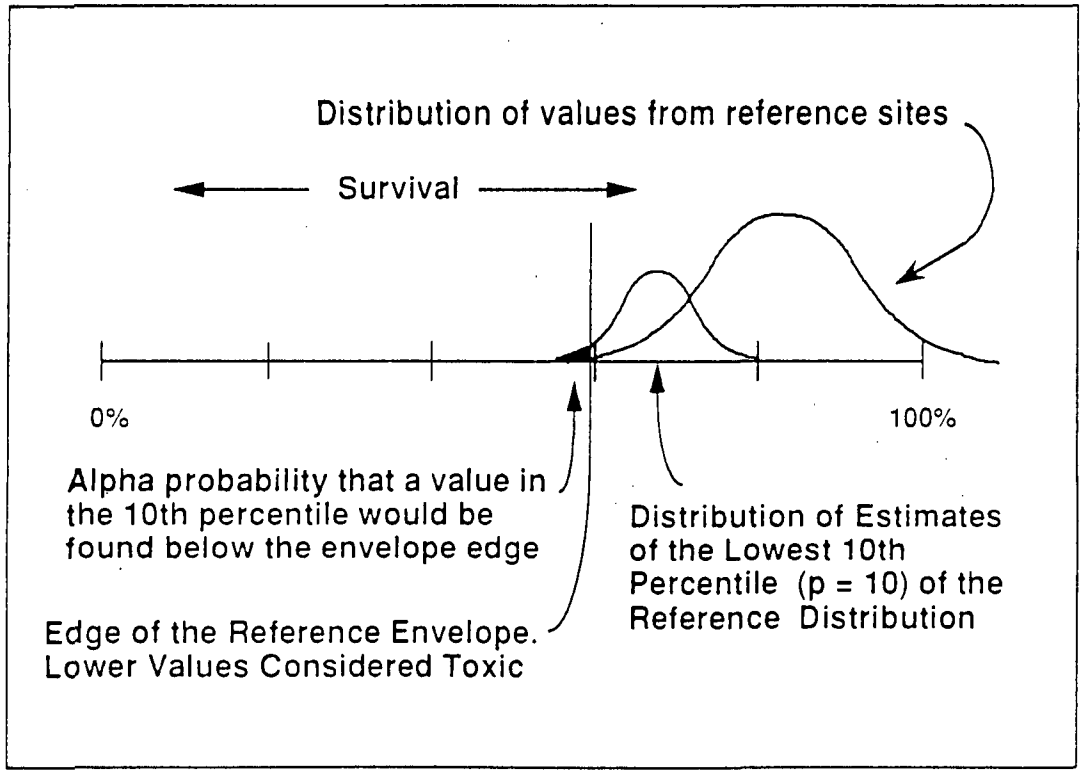

FIGURE 2: SCHEMATIC ILLUSTRATION OF THE REFERENCE ENVELOPE (LOWER TOLERANCE BOUND) TO DETERMINE TOXICITY RELATIVE TO PERCENTILE OF THE REFERENCE SITE DISTRIBUTION.

are less than the chosen value. The definition of "p" is the percentile of interest, and alpha is the acceptable error probability associated with an estimate of the p^{th} percentile. Thus, in this example, p=10 and alpha = .05.

The toxicity level can be computed that will cover the p^{th} percentile 1 minus alpha proportion of the time as the lower bound (L) of a tolerance interval (Vardeman, 1992) as follows:

$$L = X_r - [\, g_{a,p,n} * S_r \,]$$

where Xr is the mean of the sample of reference stations, S_r is the standard deviation of the toxicity results among the reference stations, and n is the number of reference stations. The g values, for the given alpha, p, and n values, can be obtained from tables in Hahn and Meeker (1991) or Gilbert (1987). S contains the within- and between-location variability expected among reference locations. If the reference stations are sampled at different times, then it is assumed that S will also incorporate space-time variability. When data are used from multiple sampling sites sampled at different times, bootstrapping techniques can and should be used to calculate an alternative statistic for "g" (i.e., the "K" values used in Hunt et al., 1998). When other variance components, such as space or time, account for a greater share of the variance, which happens frequently, the results between "g" and "K" analyses can diverge widely, giving radically different tolerance limits.

The "edge of the reference envelope" (L) represents a toxicity level used to distinguish toxic from non-toxic sediments. The value used for p will depend on the level of certainty needed for a particular regulatory situation.

Unexplained toxicity in samples from reference sites should be considered a problem (*i.e.*, the reference site no longer exhibits reference site characteristics) if toxicity occurs in more than 25 percent of reference samples, and should not be considered a problem if it occurred in less than 10 percent of reference site samples.

The reference envelope should include toxicity data from many different sampling times. Temporal variability should be included in the calculation of reference envelope if the data to do so are available.

The reference envelope for toxicity can include reference sites from a broad geographical area (as big as the entire West Coast) or be limited to the local study area, depending on specific study objectives.

To determine statistical significance, study site results should be compared to both:

1. the tolerance limit derived from a reference envelope that includes previous data, and

2. results from concurrently collected local reference site sample(s).

The RWQCBs should set reference envelope "p" values appropriate for their Regions. The "p" is the percentile of the reference distribution used to set tolerance limits.

Consideration for selection of "p" values include:

1. the degree of confidence that reference site samples are indicative of desired ambient water body conditions,

2. the level of degradation exhibited by reference site samples, and

3. the social and economic goals (impacts) associated with designating study sites as a toxic hot spot.

Low "p" values are appropriate for situations where there is high confidence that reference sites are indicative of desired environmental conditions, and the economic or social costs related to a finding of toxicity are high. Higher "p" values are more appropriate when reference sites are assumed to represent less than optimal conditions, or when policy impacts are less severe.

There may be greater uncertainty associated with the use of low "p" values. The lower the "p" value, the farther it extends into the tail of the reference population distribution, where deviations from normality are most extreme.

The reference envelope approach is strongly tied to an assumption of normality of the underlying data distribution, and that

distribution should be checked as a matter of routine. Any suggestion of strong departure from a bell-shaped or triangular distribution (e.g., skewness, multiple modes, or a flat distribution) should be cause to use the reference envelope approach results with caution. If the reference envelope approach produces tolerance limits that are counter to best professional judgment, the following steps should be taken:

1. Check the data distribution, transform data if necessary.

2. Consider switching test protocols.

3. Check that reference sites were selected appropriately.

4. Check if the "p" value is appropriate. This may involve re-evaluation of reference sites, and/or policy considerations.

5. If unexplained reference site toxicity exists, it should be investigated.

In the absence of a "reference envelope", significant toxicity relative to the surrounding water body should be determined by using a t-test control approach.

Statistical significance in t-tests should be determined by dividing an expression of the difference between sample and control by an expression of the variance among replicates. A "separate variance" t-test should be used that adjusts the degrees of freedom to account for variance heterogeneity among samples. If the difference between sample and control is large relative to the variance among replicates, then the difference is determined to be significant. In many cases, however, low between-replicate variance will cause a comparison to be considered significant, even though the magnitude of the difference can be small. The magnitude of difference that can be identified as significant is termed the Minimum Significant Difference (MSD), which is dependent on the selected alpha level, the level of between-replicate variation, and the number of replicates specific to the experiment. With the number of replicates and alpha level held constant, the MSD varies with the degree of between-replicate variation. The "detectable difference" inherent to the toxicity test protocol can be determined by identifying the magnitude of difference that can be detected by the protocol 90 percent of the time (Schimmel et al., 1994; Thursby and Schlekat, 1993). This is equivalent to setting the level of

statistical power at 0.90 for these comparisons. This is accomplished by determining the MSD for each t-test conducted, ranking them in ascending order, and identifying the 90th percentile MSD, the MSD that is larger than or equal to 90% of the MSD values generated.

Thursby et al. (1997) identify a value of 80% of the control as the detectable difference for the Ampelisca amphipod survival test in solid-phase sediments, and similar values have been derived for BPTCP test data and will and have been used in the reports.

Histopathology

Adverse effects may also be determined by visual means, for necropsy or for morphological deformities, defects, or other pathological changes in specific tissues or organs. Lesions in these tissues are often correlated with death, deformity, or poor general fitness (condition indices) of the animal, and include cancerous or precancerous transformations in tissues such as the gills, liver, reproductive organs, etc. (Okihiro and Hinton, 1996; Malins et al., 1987). Some abnormalities can, however, appear in the early stages of the development of more damaging pathologies that may be reversible (these are indications of exposure rather than actual adverse effects).

Benthic Community Analysis

Benthic community structure (organisms that live in the sediments) can be used to assess whether two sites with substantially similar physical characteristics differ in terms of the species present and numbers of individuals of each species. These types of measures focus on the population or community level. The results can then be analyzed using ordination techniques, principal component analysis, or other techniques to identify potential causes of any differences detected.

The analysis of community composition provides not only a direct assessment of impacts, but also an opportunity to identify indicator species, i.e., species that respond predictably or characteristically in the presence or absence of degraded conditions, such as those produced by a polluted benthic environment. Due to the myriad of forces influencing the composition of a community or population, it is often difficult to determine whether toxic pollutants are responsible for such changes.

To clarify whether toxicants are exerting significant effects, community analysis can be coupled with measures of individual organisms. The integration of community measures and toxicity tests provides for a weight-of-evidence that decreases the possibility of attributing adverse effects to pollutants when, in fact, they are not. The ability for individual toxicity testing methods or suites of toxicity tests to predict community level effects can also be evaluated. Benthic community analysis can also be used to evaluate reference conditions (Fairey et al., 1996). The BPTCP has used benthic community analysis to assess impacts on organisms (e.g., Fairey et al., 1996; Anderson et al., 1997).

Chemical Measures

The statutory definition of a toxic hot spot requires that the SWRCB and RWQCB focus on the effects of toxic pollutants. In the proposed specific definition of a toxic to spot the significance of chemical measures is subordinate to measures of effect (i.e., chemical measure alone will not cause a site to be designated a toxic hot spot (except as described below)). For a site to be designated a toxic hot spot, a determination of association of biological effect with measured chemistry that may contribute to the observed biological effect(s) must be made. There are several approaches available that allow a determination of chemical concentration in sediments can potentially contribute to the observed benthic or toxic effect.

1. Environmental Protection Agency (EPA) Sediment Quality Criteria (SQC)--Equilibrium Partitioning

   The EqP approach assumes that pollutants in sediments are generally in a state of thermodynamic equilibrium and that the relative concentration of a pollutant in any particular environmental compartment (sediment, pore water, ambient water, etc.) can be predicated using measured partitioning coefficients for specific substances in equilibrium equations. The EqP approach is currently limited to nonpolar, nonionic compounds although methods for metals are under development. EPA has published (EPA, 1993a; 1993b; 1993c; and 1993d) draft SQC that could be used for this purpose. Although not verified, EPA is pulling back some of the sediment values previously published. EPA used the SQC to evaluate chemical data in the National Sediment Quality Survey (USEPA, 1997b).

2. Effects Range Low (ERL), Effects Range Median (ERM), Probable Effects Level (PEL), Threshold Effects Level (TEL)

Two related efforts have been completed that provide an alternative approach for evaluating the quality of marine and estuarine sediments. These are the National Oceanic Atmospheric Administration (NOAA) (Long et al., 1995) and the sediment weight-of-evidence guidelines developed for the Florida Coastal Management Program (1992) and MacDonald, 1994).

Long et al. (1995) assembled data from throughout the country for which chemical concentrations had been correlated with effects. These data included spiked bioassay results and field data of matched biological effects and chemistry. The product of the analysis is the identification of two concentrations for each substance evaluated. One level, the Effects Range-Low (ERL) was set at the 10^{th} percentile of the ranked data and was taken to represent the point below which adverse effects are not expected to occur. The second level, the Effects Range-Median (ERM), was set at the 50^{th} percentile and interpreted as the point above which adverse effects are expected. A direct cause and effect linkage in the field data was not a requirement for inclusion in the analysis. Therefore, adverse biological effects recorded from a site could be attributed to both a high concentration of one substance and a low concentration of another substance if both substances were measured at the site. The adverse effect in field data could be caused by either one, or both, or neither of the two substances of concern.

The State of Florida efforts (1994) revised and expanded the Long and Morgan (1990) data set and then identified two levels of concern for each substance: the "TEL" or threshold effects level, and the "PEL" or probable effects level. Some aspects of this work represent improvements in the original Long and Morgan analysis. First, the data was restricted to marine and estuarine sites, thereby removing the ambiguities associated with the inclusion of freshwater sites. Second, a small portion of the original Long and Morgan (1990) database was excluded, while a considerable increase in the total data was realized due to inclusion of new information. The basic criteria for data acceptance and for classifying the information within the database were essentially the same as used by Long and Morgan (1990).

The development of the TEL and PEL differ from Long and Morgan's development of ERL and ERM in that data showing no effects were incorporated into the analysis. In the weight-of-evidence approach recommended for the State of Florida, two databases were assembled; a "no-effects" database and an "effects" database. The PEL was generated by taking the geometric mean of the 50^{th} percentile value in the effects database and the 85^{th} percentile value of the no-effects database. The TEL was generated by taking the geometric mean of the 15^{th} percentile value in the effects database and the 50^{th} percentile value of the no-effects database. By including the no effect data in the analysis, a clearer picture of the chemical concentrations associated with the three ranges of concern; no-effects, possible effects, and probable effects, can be established.

Predicting toxicity using the sediment values has recently been published (Long et al., 1998). The sediment values are reasonably good predictors of sediment toxicity and are most useful if accompanied by data from biological analyses, toxicological analyses, and other interpretative tools. These measures are most predictive of toxicity if several values are exceeded.

3. Apparent Effects Thresholds (AET) and scatterplots

The AET approach is an empirical method applying the triad of chemical, toxicological, and benthic community field survey measures to determine a concentration in sediments above which adverse effects are always expected (statistically significant adverse effects are predicted at $p<0.05$) (EPA 1989). Each suite of measures consists of chemical and toxicological measures taken from subsamples of a single sample and benthic analysis conducted on separate samples collected at the same time and place. A large suite of chemical measures and a large number of sites are required before an AET value can be estimated. The method assumes a single toxicant is responsible for effects measured at a given site. In addition, the value generated is by design, an effect level rather than a protective level. While above the AET one can expect adverse effects, the method does not recognize that below the AET adverse effects may be attributed to the substance of concern. A major limitation of the method is that the observed relationships

between effects and chemical concentrations are based on correlations only (the relationship does not demonstrate cause and effect).

4. Correlations

   Correlations between toxicity or benthic community effects and chemical concentration can be used to show the relationship between these factors. Correlation analysis is most useful in assessing which chemicals study-wide (or throughout a specific dataset) may contribute to toxicity or benthic effects (Fairey et al., 1996; Anderson et al., 1997).

5. Multivariate Analysis

   Patterns of occurrence of pollutants can be identified using multivariate techniques (cf. Anderson et al., 1988). Procedures such as Principal Components Analysis can be used to reduce a dataset from a large number of individual measurements which are often correlated with each other to a small number of uncorrelated factors, each group representing a group of pollutants that have a similar pattern distribution. These groups can be used in scatterplots, correlation calculations or subsequent multivariate analysis.

6. Sediment Toxicity Identification Evaluation

   Sediment toxicity identification evaluation (TIE) methods can be used to make a better estimate of the cause-and-effect relationship between chemicals and toxicity. TIEs provides strong scientific evidence that a chemical or group of chemicals is causing toxicity. When a specific discharger is identified and the chemical of concern is known, a study can be performed to link the observed effects with the chemical on a site-by-site basis.

7. Weight-of-Evidence

   Use any available sediment guidelines outlined in 1 through 4. This approach relies on a preponderance of evidence with all available chemical screening levels to indicate when effects produced by specific pollutants are likely to occur. This approach combined with biological measures of effect (i.e., the Sediment Quality Triad) is a very strong tool for designating

toxic hot spots (SPARC, 1997; Chapman et al., in press; Fairey et al., 1996; Anderson et al., 1997).

The BPTCP has used individual measures such as the PEL or ERM, ERM and PEL quotients (cf. Fairey et al., 1996; Anderson et al., 1997) as the values to make determinations of association between chemicals and toxicity.

The specific definition does not stipulate which chemical values to use because the environmental and pollution-related conditions are so variable throughout the State. By not specifying the precise values to use the SWRCB is allowing the RWQCBs to exercise their discretion in making the determination if observed biological effects are associated with toxic pollutants.

Water and Sediment Quality Objectives

The statutory definition of a toxic hot spot requires that if a site exceeds water or sediment quality objectives, the site is considered to be a toxic hot spot. By definition, water quality or sediment quality objectives are established for the reasonable protection of beneficial uses. Narrative water quality objectives are in the various Basin Plans and numeric water quality objectives are contained in the California Ocean Plan and some basin plans (e.g., the San Francisco Bay Basin Plan). If the California Toxics Rule is promulgated, the EPA criteria applicable to California Bays and Estuaries will apply.

Sediment quality objectives are not contained in the Basin Plans but there are narrative water quality objectives in the Ocean Plan that apply to sediments.

3. Apply a more specific toxic hot spot definition that is consistent with the intent of Section 13391.5 of the Water Code that does not include the category of "Candidate" toxic hot spot.

As in alternative 2, one of the most critical steps in the development of toxic hot spot cleanup plans is the identification of hot spots. Once they are identified the parties responsible for the sites could be liable for the cleanup of the site or further prevention of the discharges or activities that caused the hot spot. Because the cost of cleanup or added prevention could be very high, the SWRCB should consider categorizing toxic hot spots to distinguish between sites that have little or no information

(potential toxic hot spots) and areas with significantly more information (known toxic hot spots). Under this alternative, sites would be categorized as either known or potential toxic hot spots as presented in SWRCB (1993).

Under this alternative, the definition of a toxic hot spot is separated into two parts, potential and known, based on the amount of information available and the confidence we have in the interpretation of the information and whether the RWQCBs have adopted cleanup plans identifying the site as a known toxic hot spot. A site would be considered a known toxic hot spot if it exhibits significant toxicity, high levels of bioaccumulation, impairment of resident organisms, degradation of biological resources, or water or sediment quality objectives are exceeded.

The disadvantage of this alternative is that potential dischargers may be considered to be liable for the hot spot before the RWQCBs have adopted a cleanup plan.

Staff Recommendation: Adopt Alternative 2.

Issue 3: ***Criteria to Rank Toxic Hot Spots in Enclosed Bays and Estuaries of California***

Present Policy: None.

Issue Description: The development of criteria for the priority ranking of toxic hot spots in enclosed bays and estuaries is required by the California Water Code. This section reviews the statutory requirements, programmatic considerations, various ranking systems, and presents a recommended system for use in the Water Quality Control Policy.

The site ranking criteria proposals were first discussed at the January 7, 1993 SWRCB Workshop. At that workshop, the SWRCB directed the staff to conduct a staff workshop to solicit public comment. Staff workshops were held on January 26 and 28, 1993. Since that time the SWRCB has developed several versions of the ranking criteria (e.g., DWQ/SWRCB, 1995; SWRCB, 1997d). The SWRCB and RWQCB staff have discussed the ranking criteria with the BPTCP Advisory Committee and solicited their comments.

Background

The California Water Code, Section 13393.5, requires the State Water Board to develop and adopt criteria for the priority ranking of toxic hot spots in enclosed bays and estuaries. The criteria are to "take into account pertinent factors relating to public health and environmental quality, including but not limited to potential hazards to public health, toxic hazards to fish, shellfish, and wildlife, and the extent to which the deferral of a remedial action will result or is likely to result in a significant increase in environmental damage, health risks or cleanup costs."

The role of the ranking criteria is to provide a priority list of sites based on the severity of the identified problem. The Water Code calls for waste discharge requirements to be reevaluated in the ranked order. Water Code Section 13395 states, in part, that the Regional Boards shall "initiate a reevaluation of waste discharge requirements for dischargers who, based on the determination of the Regional Board, have discharged all or part of the pollutants which have caused the toxic hot spot. These reevaluations shall be for the purpose of ensuring compliance with water quality control plans and water quality control plan amendments. These reevaluations shall be initiated according to the priority ranking

established pursuant to subdivision (a) of Section 13394 and shall be initiated within 120 days from, and the last shall be initiated within one year from, the ranking of toxic hot spots."

The priority ranking for each site is to be included in a Regional Toxic Hot Spot Cleanup Plan which describes a number of factors including identification of likely sources of the pollutants that are causing the toxic characteristics and actions to be taken to remediate each site. The regional list of ranked hot spots will be consolidated into a statewide prioritized list of toxic hot spots, and included in the consolidated toxic hot spot cleanup plan.

Within specified periods of time, waste discharge requirements for each source identified as contributing to a toxic hot spot are to be reviewed and revised (with certain exceptions) to prevent further pollution of existing toxic hot spots or the formation of new hot spots. The reevaluation of permits is to be conducted in the order established by the priority ranking of hot spots.

Assumptions and Limitations of the Ranking Criteria

The Water Code Section 13393.5 requires that the criteria take into account "pertinent factors relating to public health and environmental quality, including but not limited to, potential hazards to public health, toxic hazards to fish, shellfish, and wildlife, and the extent to which the deferral of a remedial action will result or is likely to result in a significant increase in environmental damage, health risks or cleanup costs."

In addition to the considerations stipulated in Water Code Section 13393.5, several assumptions were applied to the evaluation of the various alternative ranking systems.

Assumptions

1. Criteria should address broad programmatic priorities.

2. Ranking should be based on existing information at the time of ranking; additional studies should not be required for the purpose of setting priorities on candidate or known toxic hot spots.

3. Assessment of cost and feasibility of remedial actions for a site will be considered in toxic hot spot cleanup plans but factors that influence cost will be considered as part of the ranking criteria (e.g., estimates of areal extent of a toxic hot spot).

4. The best available scientific information will be used to evaluate the data available for site ranking.

Limitations

The ranking criteria are intended to provide the relative priority of a site within the group of sites considered to be candidate or known toxic hot spots. Since not all sites will have the same scope and quality of information available at the time of ranking, this placement should be founded in measures of the potential for adverse impacts. The determination that some adverse impacts are occurring at the sites will have been made previously to the ranking and in accordance with the definition of a toxic hot spot. While the ranking should reflect the severity of the demonstrated adverse impacts, the full scope of ecological and human health impacts will likely not be characterized at the time of ranking, and therefore, should not be the goal of the ranking criteria. These impacts may be addressed as part of the activities conducted pursuant to the cleanup plans. The ranking criteria should provide a mechanism to discriminate among all those sites considered to be toxic hot spots (using the Water Code definition or another more specific definition) and thereby provide for a placement of each site relative to other sites under consideration.

The ranking criteria are not to be used to define a toxic hot spot. The determination of whether a site qualifies to be considered a toxic hot spot is a previous step.

The ranking criteria are not to be used to define cleanup actions or establish cleanup levels. The actions to be undertaken to cleanup or remediate a site will be developed on a case-by-case basis for each site. The considerations to be addressed at all sites, together with special considerations for each site, will be described in the cleanup plans required by Water Code Section 13394.

Alternatives:

Four ranking systems are presented for consideration. Two of these systems were developed for purposes somewhat different than those of the BPTCP. These are the Clean Water Strategy used by the SWRCB in the past for resource allocation and the Hazard Ranking System used by US EPA for Superfund site prioritization. These systems are offered for consideration because they are established and have been used with success for their respective purposes.

1. Use the Clean Water Strategy approach for ranking toxic hot spots.

The SWRCB's Water Quality Coordinating Committee, in 1990, developed the Clean Water Strategy (Strategy) as a management tool to provide a common framework for applying the collective professional judgment of SWRCB and RWQCB staff to identify and prioritize water quality problems. The Strategy consists of six phases which, to date, have been partially implemented. These phases are: (1) collecting water quality information, (2) comparing and ranking the importance and the condition of water bodies, (3) setting priority on work required to address threats and impairments of water quality identified in Phase 1, (4) allocation of staff and contract resources to the list generated in Phase 3, (5) implementation of the funded work, and (6) review and assessment of results and products. CWS rankings are developed through a collective professional judgment process. This process uses criteria and numerical ratings to allow statewide staff to separate and group waters in five levels of importance (value of the resource) and within each level of importance, to group the severity of problems in five levels. The CWS does not rely on formulas or weighted criteria in developing rankings. The CWS process relies on a series of "bite size" judgments and groupings, which when combined result in general consensus on final rankings.

Phases 1 and 2 of the Strategy might be applied to satisfy the Water Code requirements for Toxic Hot Spot ranking in the BPTCP. While the basic purpose of the Strategy is to prioritize responses to water quality problems (similar to Toxic Hot Spot ranking) there are some fundamental differences in purpose and approach between the Strategy and the requirements of the BPTCP. The most fundamental difference is that the Strategy creates priorities for work based on ranking of entire water bodies whereas the Hot Spot Ranking is intended to address hot spots which, except in extraordinary cases, are likely to be localized areas. In addition, the Strategy must consider a number of water quality impairments other than those caused by toxic pollutants. For instance, depressed levels of dissolved oxygen should be considered in the Strategy but would be excluded for BPTCP purposes. A third difference is that the Strategy generates independent ranked lists for several classes of water bodies (such as rivers, lakes, and wetlands), while the BPTCP is required to rank hot spots together, irrespective of the type of water body (such

as wetlands; fresh, brackish, and marine portions of estuaries; and bays). Finally, the Strategy rankings are designed to support Phases 3 and 4; i.e., proposed responsive actions and allocation of resources. In the BPTCP, determination of likely responsive actions to hot spot designations are included as part of Toxic Hot Spot Cleanup Plans and are not included in the ranking process.

Since the Strategy was developed before the BPTCP was established, it will likely be modified to incorporate new information from the BPTCP. A likely outcome of this modification will be that the toxic hot spot rankings will be included as one of the many factors used to develop water body rankings in the Strategy.

2. Use the ranking system developed for the federal Superfund Program (i.e., Hazard Ranking System).

The Hazard Ranking System (HRS) was developed as part of the implementation of the national Superfund program (US EPA, 1990). The HRS is designed to score the relative threat associated with actual or potential releases of hazardous substances from specific sites and to rank the site on the National Priority List for Superfund cleanup. The HRS provides a numerical value derived from the assessment of four different environmental pathways each evaluated for three specific factors. The pathways are: (1) ground water migration, (2) surface water migration, (3) soil exposure, and (4) air migration. The three factors are (1) the likelihood of release, (2) waste characteristics, and (3) targets. Through a series of steps, each pathway is assigned a numerical score which integrates the assessment of the three factors for that pathway. The pathway scores are then combined to produce the final site value. The site is ranked against other sites based on this final site value; larger numeric values receive a higher priority.

The actual derivation of a final site value is a rather complex process that requires a significant amount of site-specific information. Some steps in the process are common to all four pathways while others are specific to the particular pathway under consideration.

While the HRS provides a somewhat consistent treatment of sites for ranking purposes, the requirement of extensive evaluation makes it rather cumbersome and time consuming process. Furthermore, this system still requires a number of assumptions and professional judgment in order to complete the evaluation and

ranking. The HRS was developed under guidance from Congress that the system "to the maximum extent feasible, . . . accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review" (Fed. Reg. Vol 55, No. 241, pg 51532). Although this directive does not constitute a mandate for a full risk assessment before ranking, it has been interpreted to require a more detailed analysis (as evidenced by the HRS) than required for the purposes of the BPTCP. The level of details required to complete an HRS evaluation does not seem justified for BPTCP purposes.

Furthermore, the HRS is designed to emphasize threats to human health. For example, two of the three factors in the surface water-overland/flood migration path address human exposure (drinking water threat and human food chain threat), and one factor addresses environmental threats (sensitive environments). The scores for these factors further emphasize human health by allowing a maximum score for drinking water and food chain factors of 100 but only a maximum of 60 for environmental threats.

When scores are computed for the final site value, the emphasis clearly falls on human health considerations. This is in contrast to the BPTCP where human health and environmental (aquatic life and wildlife) considerations are given equal weight.

3. Use a ranking approach based on beneficial uses to be protected; chemical values in tissues, sediment and water; and other factors required by law (Weighted Numerical Toxic Hot Spot Ranking Criteria). These ranking criteria rank potential and candidate or known toxic hot spots separately.

The ranking system presented below has been designed to (1) provide a site-specific refinement of the Clean Water Strategy and (2) address specific requirements of the BPTCP (Water Code Sections 13390 et seq.).

Weighted Numerical Ranking Criteria

A value for each criterion described below should be developed provided appropriate information exists. Any criterion for which no information exists should be assigned a value of zero. The sum of the values for the six criteria will serve as the final ranking score. The maximum score is 80. In developing the score for each criterion an initial value is identified and then adjusted by one or

two correction factors as appropriate. The Alternative 3 weighted criteria follow:

A. Human Health Impacts

Potential Exposure: Select from the following the applicable circumstance with the highest value:

Human Health Advisory issued for consumption of non-migratory aquatic life from the site (assign a value of 5); Tissue residues in aquatic organisms exceed FDA/DHS action level (3); Tissue residues in aquatic organisms exceed MTRL (2).

Potential Hazard: Multiply the exposure value selected by one of the following factors:

Pollutant(s) of concern is(are) known or suspected carcinogen[1] with a cancer potency factor or noncarcinogen with a reference dose (assign a value of 5); Pollutant(s) of concern is(are) not known or suspected carcinogens without a cancer potency factor or another pollutant potentially causing human toxicity (other than cancer)(3); other pollutants of concern (1).

B. Other Beneficial Use Impacts

1. Rare, threatened, or endangered species present: Select from the following the applicable circumstance with the highest value and one other value if applicable. Do not use any species twice:

   Endangered species exposed to or dependent on the site (assign a value of 5), Threatened or rare species exposed to or dependent on the site (4), Endangered, threatened or rare species occasionally present at the site (3).

   Multiply each identified value by 2 if multiple species are present in any category. Add all resultant values for final Criteria B1 value.

2. Demonstrated aquatic life impacts: Select one or more value(s):

[1] These are substances suspected of being carcinogenic as classified in the EPA Integrated Risk Information System (IRIS), by the Office of Environmental Health Hazard Assessment or by the Department of Health Services.

Community impairments associated with toxic pollutants (assign a value of 5), statistically significant toxicity demonstrated with acute toxicity tests contained in this policy or acceptable to the SWRCB or the RWQCBs (4), Statistically significant toxicity demonstrated in chronic toxicity tests acceptable to the BPTCP (3), reproductive impairments documented (2), toxicity is demonstrated only occasionally and does not appear severe enough to alter resident populations (1).

Multiply each value by 2 if the demonstrated effects exceed 80 percent of the organisms in any given test or 80 percent of the species in the analysis.

3. Chemical measures[2]:

Any chemistry data used for ranking under this section should be no more than 10 years old, and should have been analyzed with appropriate analytical methods and quality assurance.

i. Tissue residues exceed NAS guideline (assign a value of 3), at or above State Mussel Watch Elevated Data Level (EDL) 95 (2), greater than State Mussel Watch EDL 85 but less than EDL 95 (1).

ii. Water quality objective or water quality criterion: Exceeded regularly (greater than 50 percent of the time) (assign a value of 3), infrequently exceeded (less than or equal to 50 percent of the time) (2).

iii. Sediment values (sediment weight of evidence guidelines recommended for State of Florida): Above the Probable Effects Level (PEL)[3] (3), between the TEL[4] and PEL (2). For a substance with no calculated PEL: Above the effects range

[2]The sediment values to be used in the ranking system are listed in Table 3. The tissue residue levels and criteria are available in various State Mussel Watch reports and the California Toxics Rule (EPA, 1997), respectively. Water quality objectives to be used are found in RWQCB Basin Plans (if available) or the California Ocean Plan (depending on which plan applies to the water body being addressed). Where a Basin Plan contains a more stringent value than the statewide plan, the regional water quality objective will be used.

[3]PEL is that concentration above which adverse biological effects are likely to occur. It is developed by taking the geometric mean of the 50th percentile value of the effects database and the 85th percentile value of the no-effects database.

[4]The Threshold Effects Level (TEL) is defined as the sediment concentration that is the upper limit of the minimal effects range. The value is derived by taking the geometric mean of 15th percentile of the ascending effects database and the 50th percentile of the ascending no-effects database.

median[5] (ERM) (2), between the effects range lowest 10 percent (ERL) and ERM (1).

If multiple chemicals are above their respective EDL 85, water quality objective or sediment value, select the chemical with the highest value for each of the criteria (i) through (iii) above. Add the values for (i) through (iii) (above) to derive the initial value. Multiply the initial value by 2 if multiple chemicals are suspected of contributing to the toxic hot spot.

C. Areal Extent of Toxic Hot Spot

Select one of the following values:

More than 250 acres (assign a value of 10), 50 to 250 acres (8), 10 to less than 50 acres (6), less than 10 acres (4).

D. Pollutant Source

Select one of the following values:

Source of pollution identified (assign a value of 5), Source partially accounted for (3), Source unknown (2), Source is an historic discharge and no longer active (1).

Multiply by 2 if multiple sources are identified.

E. Remediation Potential

Select one of the following values:

Site is unlikely to improve without intervention (4), site may or may not improve without intervention (2), site is likely to improve without intervention (1).

Multiply the selected value by one of the adjustment factors listed below:

Potential for immediate control of discharge contributing to the toxic hot spot or development of source control/waste minimization programs (assign a value of 4), potential for

[5]The ERM is analogous to the PEL. It is that concentration above which adverse effects are likely. It is developed by taking the 50th percentile of the ranked adverse effects data in the Long and Morgan database. The ERL is developed by taking the 10th percentile of the ranked adverse effects data.

implementation of an integrated prevention strategy involving multiple dischargers (3), site suitable for implementation of identified remediation methods (2). If site can not be classified (assign a value of 1).

Rationale for the Weighted Numerical Criteria

This section describes the rationale for each of the six criteria listed above.

Human Health Impacts

The human health impacts criterion has two parts: An estimate of potential exposure and an estimate of potential hazard. For the exposure estimate the highest score is given if a human health advisory has been issued. These advisories are an indication that aquatic life used for consumption is severely contaminated (i.e., the beneficial use is severely impaired). The FDA/DHS action levels receive a lower score because these values do not take into consideration the site-specific factors of the risk assessments used for human health advisory issued for a site. A tissue residue level above the MTRL does not by itself demonstrate a waterbody impairment. MTRLs receive the lowest scores because they are established for a specific consumption rate (6.5 g/day for the EPA Section 304(a) criteria and 23 g/day for the California Ocean Plan) and at a cancer risk level of one in one million.

The potential hazard factor assumes that the risk posed by known or suspected carcinogens with a cancer potency developed or an other pollutant of concern with a reference dose available is greater than the risk posed by pollutants without a cancer potency or reference dose available. This is consistent with the approach taken in the three Statewide Plans, EPA methods for calculating water quality criteria, and the approaches of OEHHA and DHS.

Other Beneficial Use Impacts

This criterion combines the various factors that should be considered in evaluating impacts on water quality, sediment quality, aquatic life and wildlife.

Rare, threatened or endangered species

This criterion evaluates the exposure or dependence of rare, threatened or endangered species at a known toxic hot spot. The highest value is assigned if an endangered species is exposed to or dependent upon a site and lower scores if threatened or rare species are exposed to or dependent upon a site. Exposure of endangered

species to a site is considered more severe than regular or occasional presence of rare or threatened species.

If multiple species in the categories are present the value is multiplied by 2. This value was selected to reflect the additional complexity of the situation when more than one rare, threatened or endangered species is exposed or dependent upon a site.

Demonstrated Aquatic Life Impacts

This criterion is a measure of aquatic life impact from the most severe conditions to less severe conditions. Measurements of actual measured marine or bay community impairment indicates that there is a direct measurement of impact. These kinds of impairments are difficult to measure and would only be measurable at the most highly impacted sites. Lower values are assigned to acute (short-term) and chronic toxicity (long-term or sensitive life stage tests) which serve as indicators of actual impacts. Reproductive impairments and occasional toxicity are given the lowest values because of the difficulty in interpreting these effects on aquatic life populations.

If multiple species are effected the value is multiplied by 2 to reflect a more severe condition. This multiplier is also applied if over 80 percent of the test organisms are effected. This factor will allow for distinctions to be made between moderate and more severe responses of organisms.

Chemical Measures

This criterion has three parts: (i) Tissue residues, (ii) water quality objectives and water quality criteria, and (iii) sediment values. As described in the last section of this criterion, if multiple chemicals are suspected of contributing to the known toxic hot spot then the sum of (i) through (iii) is multiplied by "2". A chemical severity factor is added to the value generated above based on the substance with the most stringent water quality objective. This factor gives more weight to chemicals that have aquatic life effects at very low concentrations.

Tissue Residues and Water Quality Objectives

Tissue residue levels are very difficult to evaluate in terms of impact on aquatic life but some measures do exist to aid in the interpretation of chemicals bioaccumulated in fish or shellfish tissue. The NAS (1972) has evaluated tissue residues for several chemicals. In this criterion, if an NAS guideline is exceeded the highest score is received. Elevated data levels (EDLs) from State

Mussel Watch, are given lower values depending on whether the EDL is above 95 percent or 85 percent. EDLs are given lower scores because they do not measure actual effect on organisms. EDLs are included because State Mussel Watch information is generally available and these data are valuable in assessing the relative exposure of organisms to toxic pollutants.

The "water quality objective or water quality criterion" criterion gives a higher value when a water quality objective from the appropriate water quality control plan or the EPA water quality criteria are exceeded regularly. If an objective is infrequently exceeded a lower score is given.

The California Enclosed Bays and Estuaries Plan and the Inland Surface Waters Plan were nullified by the California Superior Court in 1994. The objectives in these plans should, therefore, not be used for developing rankings of toxic hot spots.

In order to provide assistance in interpretation of any available water quality monitoring information the U.S. Environmental Protection Agency (EPA) water quality criteria should be used. EPA has developed water quality criteria (i.e., Clean Water Act Section 304(a) criteria) for the protection of aquatic life and human health. For aquatic life, these criteria were derived by a complex method presented in Stephan et al. (1985). Most of the aquatic life criteria are expressed as four-day averages to be exceeded no more than once every three years on average.

For many priority pollutants, EPA has developed criteria for the protection of human health. These EPA criteria assume that human exposure to contaminants can result from both drinking water and edible aquatic species. Therefore, the criteria represent concentrations in water that protect against the consumption of aquatic organisms and drinking water containing chemicals at levels greater than those predicted to result in significant human health problems. EPA methods for calculating human health criteria date from 1980 when separate equations were presented for exposure resulting from the consumption of aquatic organisms only and from the combined consumption of aquatic organisms and drinking water (Federal Register 45(231): 79347-79356, November 28, 1980).

Most of the criteria listed in the National Toxics Rule for the protection of human health have been updated (new potency factor

or reference dose taken from the Integrated Risk Information System (IRIS)).

Sediment Values

Two related efforts have been completed that provide an alternative approach for evaluating the quality of marine and estuarine sediments. These are the National Oceanic Atmospheric Administration (NOAA) (Long et al. 1995) and the sediment weight-of-evidence guidelines developed for the Florida Coastal Management Program (1993; MacDonald, 1994). Please refer to the section of the FED related to the rationale for the specific toxic hot spot definition for a description of these chemical measures.

Areal Extent of Toxic Hot Spot

The rationale for this criterion is to discount smaller sites because these sites will be difficult or perhaps may not be practical to remediate. This criterion is an estimate only. If the areal extent is completely unknown this criterion should be assigned a value of zero. While this estimate may over- or under-estimate the size of the toxic hot spot, we assume that one of the first steps in planning for a cleanup of a known toxic hot spot will be a characterization of the size of the hot spot before any remedial activity occurs.

Pollutant Source and Remediation Potential

These three criteria involve judgments of whether the sources of pollutants are identified, the likely remediation potential, and whether the State and Regional Water Boards are likely to be joined in site remediation by other agencies and the potential dischargers. These criteria will be based on the experience and judgment of the State and Regional Water Board staff.

The "pollutant source" criterion scores a site on the basis of knowledge of whether the source of pollutant is known. If the source is a result of a historic discharge (no longer active) a site is given the lowest score because it will be impossible to improve the site by modifying existing practices. The "remediation potential" criterion is an estimate of whether the site is amenable to intervention and whether waste minimization or prevention

TABLE 3: COMPARISON OF SEDIMENT[6] SCREENING LEVELS DEVELOPED BY NOAA AND THE STATE OF FLORIDA

SUBSTANCE	State of Florida[7] TEL	PEL	NOAA ERM[8]	ERL[9]	ERM[9]
Organics ug/kg					
Total PCBs	21.55	188.79	380	22.7	180
Acenaphthene	6.71	88.9	650	16	500
Acenaphthylene	5.87	127.89	44	640	
Anthracene	46.85	245	960	85.3	1100
Fluorene	21.17	144.35	640	19	540
2-methyl naphthalene	20.21	201.28	670	70	670
Naphthalene	34.57	390.64	2100	160	2100
Phenanthrene	86.68	543.53	1380	240	1500
Total LMW-PAHs	311.7	1442.0	552	3160	
Benz(a)anthracene	74.83	692.53	1600	261	1600
Benzo(a)pyrene	88.81	763.22	2500	430	1600
Chrysene	107.71	845.98	2800	384	2800
Dibenzo(a,h)anthracene	6.22	134.61	260	63.4	260
Fluoranthene	112.82	1493.54	3600	600	5100
Pyrene	152.66	1397.60	2200	665	2600
Total HMW-PAHs	655.34	6676.14	1700	9600	
Total PAHs	1684.06	16770.54	35000	4022	44792
Pesticides					
p, p'-DDE	2.07	374.17	15	2.2	27
Total DDT	3.89	51.70	350	1.58	46.1
p,p'-DDT	1.19	4.77			
Lindane	0.32	0.99			
Chlordane	2.26	4.79		0.5	6
Dieldrin	0.715	4.30		0.02	8
Endrin				0.02	45
Metals mg/kg					
Arsenic	7.24	41.6	85	8.2	70.0
Antimony				2	2.5
Cadmium	0.676	4.21	9	1.2	9.6
Chromium	52.3	160.4	145	81.0	370.0
Copper	18.7	108.2	390	34.0	270.0
Lead	30.24	112.18	110	46.7	218.
Mercury	0.130	0.696	1.3	0.15	0.71
Nickel	15.9	42.8	20.9	51.6	
Silver	0.733	1.77	2.5	1.0	3.7
Zinc	124	271.0	280	150.0	410.

[6]Values are for bulk sediment expressed on a dry weight basis
[7]MacDonald, 1996
[8]Long and Morgan, 1990
[9]Long et al., 1995

programs (implemented through permits) could be used to solve identified problems. Sites requiring sediment or other remediation or other expensive approaches receive a lower score.

4. Use a general ranking approach that groups toxic hot spots into categories. The criteria would be based on impact to aquatic life, human health and water quality objectives; and other factors required by law (Categorical Toxic Hot Spot Ranking Criteria).

The ranking system presented below has been designed to (1) provide a general criteria for ranking sites, (2) address specific requirements of the Water Code (Water Code Section 13393.5), and (3) establish a categorical ranking of toxic hot spots. The RWQCBs would be give discretion to rank sites based on the information available.

Categorical Ranking Criteria

A value for each criterion described below shall be developed provided appropriate information exists or estimates can be made. Any criterion for which no information exists shall be assigned a value of "No Action". The RWQCB shall create a matrix of the scores of the ranking criteria. The RWQCBs shall determine which sites are "High" priority based on the five general criteria (below) keeping in mind the value of the water body. The RWQCBs shall provide the justification or reason a rank was assigned if the value is an estimate based on best professional judgment.

Human Health Impacts

Human Health Advisory issued for consumption of non-migratory aquatic life from the site (assign a "High"); Tissue residues in aquatic organisms exceed FDA/DHS action level or U.S. EPA screening levels ("Moderate").

Aquatic Life Impacts

For aquatic life, site ranking shall be based on an analysis of the preponderance of information available (*i.e.*, weight-of-evidence). The measures that shall be considered are: sediment chemistry, sediment toxicity, biological field assessments (including benthic community analysis), water toxicity, toxicity identification evaluations (TIEs), and bioaccumulation.

Stations with hits in any two of the biological measures if associated with high chemistry, assign a "High" priority. A hit in one of the measures associated with high chemistry is assigned "moderate", and high sediment or water chemistry only shall be assigned "low". In analyzing the preponderance of information available, RWQCBs should take into consideration that impacts related to biological field assessments (including benthic community structure) are of more importance than other measures of impact.

Water Quality Objectives[10]

Any chemistry data used for ranking under this section shall be no more than 10 years old, and shall have been analyzed with appropriate analytical methods and quality assurance.

Water quality objective or water quality criterion: Exceeded regularly (assign a "High" priority), occasionally exceeded ("Moderate"), infrequently exceeded ("Low").

Areal Extent of Toxic Hot Spot

Select one of the following values: More than 10 acres, 1 to 10 acres, less than 1 acre.

Natural Remediation Potential

Select one of the following values: Site is unlikely to improve without intervention ("High"), site may or may not improve without intervention ("Moderate"), site is likely to improve without intervention ("Low").

Overall Ranking

The RWQCB shall list the overall ranking for the candidate toxic hot spot. Based on the interpretation and analysis of the five previous ranking criteria, ranks shall be established by the RWQCBs as "high", "moderate" or "low."

[1] Water quality objectives to be used are found in Regional Water Quality Control Board Basin Plans or the California Ocean Plan (depending on which plan applies to the water body being addressed). Where a Basin Plan contains a more stringent value than the statewide plan, the regional water quality objective will be used.

TABLE 4: NAS, FDA, AND U.S. EPA LIMITS RELEVANT TO THE BPTCP (NG/G WET WEIGHT)

Chemical	NAS Recommended Guideline[11] (whole fish)	FDA Action Level or Tolerance[12] (edible portion)	USEPA Screening Values[13] (edible portion)
Total PCB	500	2000**	10
Total DDT	50	5000	300
aldrin	*	300**,***	-
dieldrin	*	300**,***	7
endrin	*	300**,***	3000
heptachlor	*	300**,***	-
heptachlor epoxide	*	300**,***	10
lindane	50	-	80
chlordane	50	300	80
endosulfan	50	-	20,000
methoxychlor	50	-	-
mirex	50	-	2000
toxaphene	50	5000	100
hexachlorobenzene	50	-	70
any other chlorinated hydrocarbon pesticide	50	-	
dicofol	-	-	10,000
oxyfluorfen	-	-	800
dioxins/dibenzofurans	-	-	$7x10^{-4}$
terbufos	-	-	1000
ethion	-	-	5000
disulfoton	-	-	500
diazinon		-	-
900			
chlorpyrifos	-	-	30,000
carbophenothion	-	-	1000
cadmium	-	-	10,000
selenium	-	-	50,000
mercury	-	1000**(as methyl mercury)	600

*Limit is 5 ng/g wet weight. Singly or in combination with other substances noted by an asterisk.
**Fish and shellfish.
***Singly or in combination for shellfish

[11] National Academy of Sciences. 1973. Water Quality Criteria, 1972 (Blue Book). The recommendation applies to any sample consisting of a homogeneity of 25 or more fish of any species that is consumed by fish-eating birds and mammals, within the same size range as the fish consumed by any bird or mammal. No NAS recommended guidelines exist for marine shellfish.

[12] U.S. Food and Drug Administration. 1984. Shellfish Sanitation Interpretation: Action Levels for Chemical and Poisonous Substances. A tolerance, rather than an action level, has been established for PCB.

[13] U.S. Environmental Protection Agency. 1993. Guidance for assessing chemical contaminant data for use in fish advisories. Volume 1. EPA 823-R-93-002. Office of Water. Washington, D.C.

Rationale for the Categorical Ranking Criteria

This section describes the rationale for each of the six criteria listed above. One of the most important features of the categorical ranking criteria is that no criterion is given a numerical value. Each criterion is given a "High", "Moderate" and, sometimes, a "Low" value. This approach gives considerable flexibility to the RWQCBs in establishing the priority of a site.

Human Health Impacts

The human health impacts criterion has two parts: A "High" ranking is given if a human health advisory has been issued. These advisories are an indication that aquatic life used for consumption is severely contaminated (i.e., the beneficial use is severely impaired). If tissue levels exceed FDA/DHS action levels receive a "Moderate" ranking because these values do not take into consideration the site-specific factors of the risk assessments used for human health advisory issued for a site.

Aquatic Life Impacts

This criterion combines the various factors that should be considered in evaluating impacts on water quality, sediment quality, aquatic life and wildlife. In developing a ranking for the aquatic life criterion the RWQCB should consider all available information on a site. The decision to rank a site "High" under this criterion should take into consideration the preponderance of evidence (or the weight-of-evidence) (e.g., Fairey et al., 1996: Anderson et al., 1997; SPARC, 1997; Chapman et al., in press). If data from more than one type of effect are available that shows effects on organisms then the ranking is higher. If only high chemical concentrations are found at the site then the site is ranked "Low" because no information is available to show aquatic life beneficial uses are impacted.

The measurements to be considered for the weight-of-evidence include the individual measures of the sediment quality triad (SPARC, 1997), water toxicity tests (SWRCB, 1993), toxicity identification evaluations, and bioaccumulation (NAS, 1973). Measures of pollutant bioaccumulation in tissues should be compared to measures of effect on the organism not simply elevated data levels as used in the SMW. If information is available from biological field assessments (such as benthic community analysis) those data should be viewed by the RWQCBs as having more importance (if data are compared to proper

reference conditions) because these types of studies are direct assessments of impacts on organisms in the environment. As with the other measurements, a good deal of RWQCB judgment is necessary to review and establish priorities using biological field data.

Under the ranking scheme the RWQCBs are given flexibility in choosing the critical chemical values for determining the significance of chemical measurements made.

Water Quality Objectives

The "water quality objective or water quality criterion" criterion results in a higher value when a water quality objective from the appropriate water quality control plan or promulgated EPA water quality criteria are exceeded regularly. If an objective is infrequently exceeded a lower score is given.

The California Enclosed Bays and Estuaries Plan and the Inland Surface Waters Plan were nullified by the California Superior Court in 1994. The objectives in these plans will, therefore, not be used for developing rankings of toxic hot spots.

The definitions of "regularly", occasionally" and "infrequently" are not stated because of the site- and Region-specific interpretations that will be necessary to use this criterion.

Areal Extent of Toxic Hot Spot

The results for this criterion is to present an estimate of the areal extent of the toxic hot spot. No qualitative measure (e.g., "High" or "Moderate") is required. Interpretation of this criterion therefore is left to the discretion of the RWQCBs. RWQCBs may discount smaller sites in their ranking because these sites will be difficult or perhaps may not be practical to remediate or, in the RWQCB's view they may wish to place higher priority on larger sites or water bodies.

In practically every circumstance, this criterion is an estimate only. One of the first steps in planning for a cleanup of a known toxic hot spot should be a characterization of the size of the hot spot before any remedial activity occurs.

Natural Remediation Potential

This criterion involves judgments of the likely remediation potential. This criterion will be based on the experience and judgment of the RWQCB.

The " natural remediation potential" criterion is an estimate of whether the site is amenable to intervention and whether waste minimization or prevention programs (implemented through nonpoint source management, WDRs and permits) could be used to solve identified problems. Sites unlikely to improve without intervention receive a "High" ranking. Sites where remediation may be needed would rank as "Moderate". In these cases, ranking sites as "High" or "Moderate" is an acknowledgment that there will be costs to the State or dischargers for site cleanup or prevention of the toxic hot spot. If no remediation is warranted or sites will improve without intervention, the site would rank as "Low".

Overall Ranking

This section is the overall ranking a site received based on the RWQCB assessment of the five previously listed and described general ranking criteria. The RWQCBs should give their overall ranking as "high", "moderate" or "low".

Staff Recommendation: Adopt Alternative 4.

Issue 4: ***Mandatory Requirements for Regional Toxic Hot Spot Cleanup Plans and Issues to be Considered in the Consolidated Cleanup Plan***

Present Policy: None.

Issue Description: The SWRCB and RWQCBs are required by the Water Code (Section 13394) to address a variety of topics including the following information:

1. A priority ranking of all toxic hot spots, including recommendations for remedial actions;

2. A description of each toxic hot spot including a characterization of the pollutants present at the site;

3. An estimate of the total cost to implement the cleanup plan;

4. An assessment of the most likely sources of pollutants; (potential dischargers)

5. An estimate of recoverable costs from responsible parties;

6. Preliminary assessment of actions required to remedy or restore a THS to an unpolluted condition;

7. A two-year expenditure schedule identifying state funds to implement the plans;

8. A summary of actions that have been initiated by the regional boards to reduce the accumulation of pollutants at existing THSs and to prevent the creation of new THSs; and

9. Findings and recommendations concerning the need for a toxic hot spot cleanup program. (This factor is to be considered only by the SWRCB.)

These requirements are somewhat general and many of the topics require some definition and clarification if they are to be applied consistently Statewide. Also, there are several issues that should be considered by the SWRCB in developing the consolidated toxic hot spot cleanup plan. Several issues that should be considered in the consolidated cleanup plan were discussed at the public hearing on the draft FED.

Alternatives:

1. Do not adopt any additional guidance for development of toxic hot spot cleanup plans.

The only guidance required by the Water Code for implementation of the Bay Protection and Toxic Cleanup Program is for the Ranking Criteria (Section 13393.5). The SWRCB is not required to adopt any additional guidance for the Program or cleanup plans. An advantage of this approach is that the RWQCB has complete flexibility in interpretation of Water Code Section 13394. A disadvantage is that there is a great possibility of inconsistent implementation of the Program across the State.

2. Adopt guidance on each of the required sections of cleanup plans to require consistency of form and application of the various provisions.

The SWRCB could specify what is required to adequately and consistently develop the Regional and Statewide Cleanup Plans. This additional guidance should not limit the RWQCBs to the quantity of information presented but rather should establish the basic amount of information necessary to complete the requirements of the Water Code. Also, the Policy should contain an outline and template for the Regional Toxic Hot Spot Cleanup Plans in order to make the plans as consistent as possible.

3. Adopt Alternative 2 plus information on issues that could be considered in the consolidated toxic hot spot cleanup plan.

Several issues were raised at the May 5, 1998 and May 11, 1998 hearing and in the written comments on factors that should be considered as part of the consolidated plan. The SWRCB should consider incorporating the following information in the consolidated plan: (1) a process for delisting sites after they have been remediated, or if the problem no longer exists, at the site or water body; (2) guidance on reevaluation of WDRs; (3) findings and recommendations for funding the implementation of the plans (i.e., the need for a toxic hot spot cleanup program as described in the Water Code Section 13394(i)); and (4) approaches for compiling the regional toxic hot spot cleanup plans.

All the requirements for Alternative 2 would also be included in this alternative. The advantage of this alternative is that the public

will have a better idea of the factors that will be considered by the SWRCB when the consolidated toxic hot spot cleanup plan is developed.

Staff Recommendation: Adopt Alternative 3.

Please refer to the proposed Policy (page "xiv" through "xix") for the mandatory requirements for the cleanup plans, issues to be considered by the SWRCB in the consolidated cleanup plan (page "xlviii" through "xlix") , and the template (page "l" through "lii").

Issue 5: ***Remediation Actions and Costs***

Present Policy: None.

Issue Description: The RWQCBs are required to determine the type of remedial action and the cost for addressing the identified toxic hot spots. Remedial technologies should be identified and screened on the basis of effectiveness, cost effectiveness and implementability. Remedial technologies should attempt to satisfy the remedial objective; i.e., protect beneficial uses. The approach should include identifying the action, the technologies available, and the option that is technically practicable.

In the evaluation of cleanup options, one must consider a possible short-term or long-term increase in exposure, or the potential for providing new exposure pathways during the remediation process, as in dredging/disposal options. Choosing not to disturb the sediments may also be a viable option, and may mean leaving the material in place, and/or containing it. If wastewater treatment, stormwater or nonpoint sources of pollution are impacted by the designation of toxic hot spots, the RWQCBs should also consider remedial actions and costs necessary to address these actions as well.

In determining remediation actions, reasonable costs must also be factored into the selection of an appropriate alternative.

Alternatives: 1. Treatment of the site sediments only.

Remediation Methods for Sediment-related Toxic Hot Spots

Site treatment involves the physical or chemical alteration of material. The treatment must reduce or eliminate the toxicity, mobility, or volume of polluted material. Treatment may be either (a) *in situ*, or (b) *ex situ*. In situ treatment requires uniform treatment and confirmation of effectiveness; however, *in situ* methods generally have not been considered effective in marine sediments.

Ex situ treatment requires a treatment area, or a dedicated site to assure effectiveness.

Types of treatment include:

- *in situ* bioremediation (Table 5),
- soil washing and physical separation (Table 6),
- chemical separation and thermal desorption (Table 7),
- immobilization (Table 8),
- thermal and chemical destruction (Table 9), and
- *ex situ* bioremediation (Table 10).

The treatment choice should be pollutant specific. The choice depends upon the chemical characteristics of the pollutants, as well as physical and chemical characteristics of the sediments; for example, clay content, organic carbon content, salinity, and water content. Some treatment options produce by-products which require further handling. Although these technologies are currently being employed for soils, their effectiveness for use in marine sediments should be thoroughly evaluated. If the safety and effectiveness of treatment options are not well known, bench tests and pilot projects should be performed prior to authorization of the use of such treatment methods.

TABLE 5: IN-SITU BIOREMEDIATION

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) None documented for marine sediments; (b) examples from freshwater sediment are limited to special cases on pilot scale, e.g., chemical stimulation of dehalogenation (but no degradation) of PCBs in the Housatonic River, Connecticut; (c) stimulation of degradation with addition of active microbes in Hudson River, New York.	(a) Pollutant is biologically available; (b) concentration of pollutant appropriate for bioactivity, e.g., sufficiently high to serve as substrate or not high enough to be toxic; (c) limited number or classes of pollutants that are biodegradable; less known for complex mixtures; (d) site is reasonably accessible for management and monitoring; (e) rapid solution is not required.	Based on experience from soil systems, it offers the potential for (a) complete degradation and elimination of organic pollutants; (b) reduced toxicity of sediment from partial biotransformation; (c) less materials handling, which can result in substantially lower costs; (d) no need for placement sites; (e) favorable public response and acceptability.	(a) Not a proven technology for sediments (freshwater or marine); (b) likely to require manipulation and disturbance of sediment; (c) can require containment which limits volume that is treatable; (d) can require long time periods, especially in temperate waters; (e) ineffective for low level pollution; (f) not applicable to areas of high turbulence or sheer; (g) not applicable for high molecular weight polyaromatic hydrocarbons.	(a) Fundamental understanding of biodegradation principles in marine environments; (b) bioavailability of sorbed pollutants and the effect of aging; (c) exploration of anaerobic degradation processes for the largely impacted near-shore anoxic sediments; (d) laboratory, pilot, and field demonstration of effectiveness for marine sediments; (e) interaction of physical, chemical, and microbiological processes on biodegradation, e.g., sediment composition, hydrodynamics; (f) analysis of cost-effectiveness; (g) exploration of combining in-situ bioremediation with capping.

TABLE 6: SOIL WASHING AND PHYSICAL SEPARATION

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Well developed by mining industry and frequently used for sediments.	Where pollutant is predominantly associated with fine-grained material that is a small fraction of the total solids.	(a) Mature technology that can reduce volumes of polluted material requiring subsequent treatment; (b) soil washing can be used to recover Confined Disposal Facility space for later reuse.	Original sediments must have a significant proportion of sand for the process to be cost effective.	None identified.

TABLE 7: CHEMICAL SEPARATION AND THERMAL DESORPTION

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) Pilot plant studies conducted on metal desorption by acid-leaching solutions and at least one full-scale implementation; (b) pilot and full-scale application of organics separation by liquid solvents and supercritical fluids; (c) organic chemical thermal desorption also has had full-scale demonstration; (d) thermal desorption used at Waukegan Harbor.	Suitable for weakly bound organics and metals.	Pollutant is removed and concentrated.	(a) Batch extraction during separation requires multiple cycles to achieve high removal; (b) fluid-solid separation is difficult for fine-grained materials; (c) a separate reactor is needed to remove the pollutant from the extracting fluid so that the extracting fluid can be reused; (d) thermal desorption requires temperatures that will vaporize water, and sediment particles must be eliminated from gaseous discharge; (e) pollutant removal from the gas phase following thermal desorption is another treatment process that is required.	Systems integration for complete pollutant isolation or destruction.

TABLE 8: IMMOBILIZATION

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Extensive knowledge based on inorganic immobilization within solid wastes and dry soils.	Chemical fixation and immobilization of trace metals.	(a) Chemical isolation from biologically accessible environment; (b) process is simple and there is a history of use for sludge.	(a) Sediment should have moisture content of less than 50 percent, and solidified volumes can be 30 percent greater than starting material; (b) limited applicability to organic pollutants; (c) high organic pollutant levels may interfere with treatment for metals immobilization; (d) need for placement of solidified sediments.	(a)Studies of long-term effectiveness for pollutant isolation; (b) develop sediment placement options, especially for beneficial uses.

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TABLE 9: THERMAL AND CHEMICAL DESTRUCTION

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Thermal oxidation in flame and thermal reduction in nonflame reactors have been extensively tested and demonstrated.	Process destroys organic pollutants in sediment samples at efficiencies of greater than 99.99 percent but at very high costs.	Very effective.	(a) Very expensive; (b) metals mobilized into the gas phase require gas phase scrubbing; (c) water content of sediment increases energy costs.	(a) process control to prevent upsets and effluent gas treatment for metals containment; (b) facility design to control the destruction process.

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TABLE 10: EX SITU BIOREMEDIATION

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) Limited experience; (b) transfer of soil-based technologies to marine sediments is not proved and may not be directly applicable because of the different biogeochemistry of marine sediments; (c) but general trends should translate; (d) examples from freshwater sediment have been carried out at the pilot scale in the assessment and remediation of polluted sediments program, as well as in Europe; (e) PCBs were treated ex situ at a Sheboygan River site.	(a) Pollutant is biologically available; (b) concentration of pollutant appropriate for bioactivity (e.g., sufficiently high to serve as substrate, not high enough to be toxic); (c) limited number or classes of pollutants are biodegradable; less known for complex mixtures; (d) site is reasonable accessible for management and monitoring; (e) rapid solution is not required.	Based on experience from freshwater systems, it offers the potential for (a) degradation (as opposed to mass transfer) of some organic pollutants; (b) possible reduction of toxicity from biotransformation in those cases in which complete mineralization does not occur; (c) containment of polluted material allowing for an engineered system and enhanced rates, when compared to in situ biotransformations; (d) public acceptability.	(a) Far from a proven technology--all work with marine sediments is at the bench-scale; (b) requires handling of polluted sediment; (c) slow compared to chemical treatment; (d) ineffective for low levels of pollution, and does not remove 100 percent of pollutants; (e) not applicable for very complex organics, such as high-molecular-weight compounds; (f) susceptible to matrix effects on bioavailability.	(a) Fundamental understanding of biodegradation principles in engineered systems; (b) exploration of aerobic/anaerobic combinations or comparisons; (c) laboratory, pilot, and field demonstrations; (d) analysis of cost effectiveness; (e) exploration of bioremediation as part of more extensive treatment trains.

2. Dredging: Sediment Removal and Disposal or Reuse

Dredging may be combined with containment or offsite disposal (Table 11). Selection of the method depends upon the amount of resuspension of sediments caused by the dredge at the removal site and at the disposal site. To reduce the transport of polluted sediment to other areas, silt curtains constructed of geotextile fabrics may be utilized to minimize migration of the resuspended sediments beyond the area of removal. Consideration must also be given to temporary loss of benthic organisms at the removal site and at the disposal site.

Selection of the dredging method should take into account the physical characteristics of the sediments, the sediment containment capability of the methods employed, the volume and thickness of sediments to be removed, the water depth, access to the site, currents, and waves. Consideration should also be given to placement site of the material once it is removed.

Typical dredging methods include mechanical or hydraulic dredging. Mechanical dredging often employs clamshell buckets and dislodges sediments by direct force. Sediments can be resuspended by the impact of the bucket, by the removal of the bucket, and by leakage of the bucket. Mechanical dredging generally produces sediments low in water content.

TABLE 11: CONFINED DISPOSAL FACILITY

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
(a) The most commonly used placement alternative for polluted sediments; (b) hundreds of sites nationwide for navigation dredging projects; (c) often used for pretreatment prior to final placement or as final sediment placement site for remediation projects.	Applicable to a wide variety of sediment types and project conditions.	(a) Low cost compared to ex situ treatment; (b) compatible with a variety of dredging techniques, especially direct placement by hydraulic pipeline; (c) proper design results in high retention of suspended sediments and associated pollutants; (d) engineering for basic containment normally involves conventional technology; (e) controls for pollutant pathways usually can be incorporated into site design and management; (f) conventional monitoring approaches can be used; (g) site can be used for beneficial purposes following closure, with proper safeguards.	(a) Does not destroy or detoxify pollutants unless combined with treatment; (b) control of some pollutant loss pathways may be expensive.	(a) Design approaches, such as covers and liners, needed for low cost pollutant controls; (b) design criteria for treatment of releases or control strategies for high profile contaminates; (c) methods for site management to allow restoration of site capacity and potential use of treated materials.

Hydraulic dredging uses centrifugal pumps to remove sediments in the form of a slurry. Although less sediment may be resuspended at the removal site, sediment slurries contain a very high percentage of water at the end of the pipe.

Removal and consolidation often involves a diked structure which retains the dredged material (Tables 12 and 13). Considerations include:

A. construction of the dike or containment structure to assure that pollutants do not migrate,

B. the period of time for consolidation of the sediments,

C. disturbance or burying of benthic organisms,

D. Disposal to an offsite location, either upland (landfill), in-bay, or ocean. Considerations once the material has been dredged should be (1) staging or holding structures or settling ponds, (2) de-watering issues, including treatment and discharge of wastewater, (3) transportation of dredged material, (*i.e.*, pipeline, barge, rail, truck), or (4) regulatory constraints.

3. Containment of Polluted Sediments

Containment can prevent human or ecological exposure, or prevent migration of pollutants. Containment can be either in-place capping, or removal and consolidation at a disposal structure (Tables 11, 13 and 14). Containment options such as capping clearly reduce the short-term exposure, but require long-term monitoring to track their effectiveness.

TABLE 12: CONTAINED AQUATIC DISPOSAL

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Limited application. Reviews exist concerning (a) necessary data, equipment, and procedures; (b) engineering considerations; (c) guidelines for cap armoring design; (d) predicting chemical containment effectiveness.	(a) Costs and environmental effects of relocation are factors; (b) suitable types and quantities of cap material are available; (c) hydrologic conditions will not compromise the cap; (d) cap can be supported by original bed; (e) appropriate for sites where excavation is problematic or removal efficiency is low; (f) cap material is compatible with existing aquatic environment.	(a) Eliminates need to remove polluted sediments; (b) cost effective for sites with large surface areas; (c) effective in containing pollutants by reducing bioaccessibility; (d) promotes in situ chemical or biological degradation; (e) maintains stable geochemical and geohydraulic conditions, minimizing pollutant release to surface water, groundwater, and air.	(a) Laboratory and field validation of capping procedures and tools; (b) analysis of data from existing and ongoing field demonstrations to support capping effectiveness; (c) test for chemical release during bed placement and consolidation; (d) tests to evaluate and simulate the effects of cap penetration by deep burrowing organisms; (e) simulate and evaluate consequences of mixing; (f) potential loss of pollutants to the water column may require controls during placement.	(a) Design criteria for treatment of releases or control strategies for high-profile pollutants; (b) improved methods for evaluation of potential pollutant release pathways; (c) develop reliable cost estimates.

TABLE 13: LANDFILLS

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Used for several dredged material and Superfund projects involving polluted sediments.	(a) Small volumes; (b) where no other alternatives or sites are available.	(a) Does not require acquisition of permanent placement site; (b) may be most cost effective for small volumes; (c) effectiveness is inherent in the site license.	(a) Lack of landfill capacity in most regions of the country; (b) requires handling and transport to the landfill; (c) restriction on free liquids requires dewatering as a pretreatment step.	Improved methods for rehandling, dewatering, and transporting dredged sediments.

The process for stabilization of sites using sub-aqueous capping to contain toxic waste at a site would be to follow the basic three-step approach and apply the criteria shown in U.S. EPA Report No. 893-B-93-001, Selection of Remediation Techniques for Contaminated Sediment. This federal remediation document provides a list of performance considerations to test whether clean sediments consisting of sands and silts can be used to effectively contain the waste, either at the present location or at some other location. The list includes, in part:

A. Capping provides adequate coverage of polluted sediments and capping materials can be easily placed.

B. The integrity of the cap must be assured to prevent burrowing organisms from mixing of polluted sediments (bioturbation).

C. The ability of the polluted sediment to support the cap, *i.e.*, causing settlement or loading.

D. The bottom topography causing sloping or slumping of the capped material during seismic events.

E. Cap erosion or disruption by currents, waves, bioturbation, propeller wash, or ship hulls.

F. Future use of capped area, *i.e.*, shipping channel.

Another consideration is presented in the U.S. EPA document concerning whether the no-action alternative would accomplish the same end as capping the site; however, this option should be considered as the last alternative.

TABLE 14: IN-PLACE CAPPING

State of Practice (system maturity, known pilot studies, etc.)	Applicability	Advantages/Effectiveness	Limitations	Research Needs
Less than 10 major in situ capping projects in North America have been competed (more than 20 worldwide). Reviews exist concerning (a) necessary data, equipment, and procedures; (b) engineering considerations; (c) guidelines for design of cap armor; and (d) predicting effectiveness of chemical containment.	(a) Pollutant sources have been substantially abated; (b) natural recovery is too slow; (c) costs and environmental effectiveness of relocation are too high; (d) suitable types and quantities of cap material are available; (e) hydrologic conditions will not compromise the cap; (f) cap can be supported by original bed; (g) appropriate for sites where excavation is problematic or removal efficiency is low.	(a) Eliminates need to remove polluted sediments; (b) effective in containing pollutants by reducing bioaccessibility; (c) promotes in situ chemical or biological degradation; (d) maintains stable geochemical and geohydraulic conditions, minimizing pollutant release to surface water, groundwater, and air; (e) relatively easy to implement; (f) eliminates bioturbation and resuspension; (g) reduces pollutant release to water column; (h) easily replaced or repaired; (i) in shallow water, creates wetlands, dry lands, or reduces water column depth.	(a) Cap incompatible with bottom material can alter benthic community; (b) subject to erosion by strong currents and wave action; (c) subject to penetration/destruction by deep burrowing organisms; (d) destroys/changes benthic communities/ecological niches; (e) requires ongoing monitoring for cap integrity; (f) dilutes pollutants in original bed if subsequent removal/remediation is required.	(a) Analysis of data from existing and ongoing field demonstrations to support capping effectiveness; (b) controls for chemical release during bed placement and consolidation; (c) test to simulate and evaluate consequences of episodic mixing, such as anchor penetration, propeller wash, and/or mechanical penetration.

4. No Remediation (Natural Remediation or "No Action")

This alternative consists of two elements: (a) institutional or interim controls and (b) the no remediation/no action alternative. The first element, institutional controls could include, but is not limited to, posting of warning signs, or monitoring of water, sediments, or organisms. This element would be protective of human health by providing warning signs for fishing, etc., but not protective of aquatic life.

The second element is the no remediation alternative. If by no action, the toxic hot spot is to be left in place, because to move it, or to disturb it in any way would be detrimental, then "no action" should be considered. This would have to be proven beyond any doubt, and would not be "an easy way out" of dealing with a toxic hot spot.

The no-remediation/no-action alternative should be considered only after all other alternatives have been studied (Table 15). State Board Resolution 92-49 (as amended) requires that regional boards compel dischargers to clean up wastes to protect beneficial uses (III.G.). Resolution 92-49 also requires regional boards to consider "Minimizing the likelihood of imposing a burden on the people of the state with the expense of cleanup and abatement..." (IV.D.).

If the no-remediation/no-action alternative is to be implemented, the RWQCB should determine the following: (a) Point source discharges have been controlled, (b) The costs and environmental effects of moving and treating polluted sediment are too great, (c) Hydrologic conditions will not disturb the site, (d) The sediment will not be remobilized by human or natural activities, such as by shipping activity or bioturbation, (e) Notices to abandon the site have been issued to appropriate federal, state, and local agencies and to the public, (f) The exact location of the site and a list of chemicals causing the toxic hot spot and their quantities are noted on deeds, maps, and navigational charts, and (g) A monitoring program is established to measure changes in discharge rates from the site.

If a no-remediation alternative is considered, RWQCBs should provide an assessment of the geographic extent of the pollution, the depth of the pollution in the sediment, compelling evidence that no treatment technologies should be applied and that only the no-remediation alternative is feasible at the site, and a cleanup cost

comparison of all other treatment technologies versus the no-remediation alternative.

If a no-remediation alternative is considered, the following information shall be provided in the proposed cleanup plan:

A. Sources of pollution which caused the toxic hot spot to exist.

B. A monitoring program description, specifying the duration of the monitoring, and all organizations which will carry it out.

C. Monitoring program which will show whether rates of pollutant release and the area of influence of the pollutants are not accelerating.

D. Detailed assessment containing proof that all of the following statements are true:

(1) Pollutant discharge has been controlled.

(2) Burial or dilution processes are rapid.

(3) Sediment will not be remobilized by human or natural activities.

(4) Environmental effects of cleanup are equal to or more damaging than leaving the sediment in place.

(5) Unpolluted sediments from the drainage basin will integrate with polluted sediments through a combination of dispersion, mixing, burial, and/or biological degradation.

(6) Polluted sediments at the site will not spread.

(7) The site will be noted on appropriate maps, charts, and deeds to document the exact location of the site.

For no-remediation alternatives, a map of the area should be required to be provided by potential discharger(s) to the US Army Corps of Engineers, US Coast Guard, National Oceanic and Atmospheric Administration, Coastal Commission, State Lands Commission, and harbor authorities to be included on official navigational charts and other maps to document the exact location of the site and the depth of the site and the pollutants encountered.

TABLE 15: NATURAL RECOVERY

State of Practice (system maturity, known pilot studies, etc.)	Applicability	advantages/Effectiveness	Limitations	Research Needs
Selected for James River, New York Kepone pollution and considered at Port of Tacoma, Washington site.	(a) Bed is stable or depositional; (b) chemical release rates are low; (c) interim controls can maintain safety to health and environment; (d) pollution level at active surface is low, but areal extent is large; (e) most of the pollution is below the bioturbed zone; (f) pollutants are underlain by low permeability strata; (g) site is not subject to dredging or other disturbance; (h) source of pollution has been abated.	(a) There may be less environmental risk to await natural capping than to attempt sediment removal; (b) removal may cause physical harm to bottom communities as well as suspend and disperse pollutants; (c) cleanup cost may be prohibitive because of large area and low level of pollution; (d) low cost.	(a) Effectiveness of in-bed processes that govern chemical containment and/or destruction is poorly known; (b) bed remains subject to resuspension by storms or anthropogenic processes; (c) should only rarely be used in beds of flowing streams; (d) not appropriate if dredging is required or bulk quantities of chemicals, such as non-aqueous liquids or solids, are present.	(a) Develop scientific principles to describe the process of natural recovery; (b) based on a literature survey, document the success, failure, effectiveness, *etc.*, of sites that have undergone natural recovery either by design or default; (c) develop accepted measuring protocols to determine in situ chemical flux from bed sediment to the overlying water column; (d) develop protocols for assessing the relative contribution of the five or more mechanisms for chemical release or movement from bed sediments.

5. Remediation methods for wastewater treatment facilities.

Approaches for addressing toxic hot spots associated with wastewater treatment facilities should be designed to fit into the characteristics on the surrounding environment. Therefore, all the methods discussed below are examples for general planning purposes and are not intended to be used inconsistently with the Water Code (especially Section 13360).

Remediation Methods for Water-related Toxic Hot Spots

The three basic approaches which may be practiced independently or concurrently are pollution prevention, pretreatment and recycle and reuse. The RWQCBs should develop prevention activities tailored to local conditions and the tools available. The RWQCBs should also provide enough flexibility to dischargers so they can select the most cost-effective approaches for addressing wastewater-related problems.

A large number of technically feasible wastewater treatment methods are available. The treatment technologies that may possibly be applicable to situations in California coastal waters are presented in Table 16. The wastewater treatment methods are analyzed in a NRC report on managing wastewater in coastal urban areas (NRC, 1993). Predicted effluent quality from the various treatment trains are presented in Table 17.

Methods for addressing stormwater and nonpoint sources are emerging and RWQCBs should use their best judgment in suggesting best management practices (BMPs) and their costs.

Since the costs of implementing treatment technologies and BMPs are dependent on a huge variety of site-specific considerations, it is not recommended that the SWRCB adopt general cost estimates for treatment technologies and BMPs. In fact, realistic cost estimates for addressing the toxic hot spot will not be available until dischargers involved in the efforts weigh the differences in cost of addressing water quality problems by evaluating the costs of pretreatment, additional treatment, various BMPs, and

recycle/reuse options. It is, therefore, necessary for the RWQCBs to involve dischargers in an effort to address the water quality impairment based on the scale of the problem (i.e., if the problem is localized or if the problem is water body-wide).

It is recommended that the RWQCBs develop watershed management efforts (scaled to the size of the water quality problem) to address the toxic hot spot. Specific cost estimates should only be developed as part of implementation of the toxic hot spot cleanup plan and should include an assessment of the cost effectiveness of modifying all sources of pollution (including, but not limited to, point sources, stormwater, and nonpoint sources). In the cleanup plans, the RWQCBs should present the costs of implementing the watershed management coordination effort.

TABLE 16: WASTEWATER TREATMENT SYSTEMS

System	Type of Treatment
1	Primary
2	Chemically enhanced primary
	a. Low-dose chemically -enhanced primary
	b. High-dose chemically-enhanced primary
3	Conventional primary plus biological treatment
4	Chemically-enhanced primary plus biological treatment
5	Primary or chemically enhanced primary plus nutrient removal
6	System 5 plus gravity filtration
7	System 5 plus high lime plus filtration
8	System 5 plus granular activated carbon plus filtration
9	System 5 plus high lime plus filtration plus granular activated carbon
10	System 9 plus reverse osmosis

Adapted from NRC. 1993. Managing wastewater in coastal urban areas. Committee on Wastewater Management for Coastal Urban Areas, Water Science and Technology Board, Commission on Engineering and Technical Systems, National Research Council. National Academy Press, Washington, D.C.

TABLE 17: TYPICAL EFFLUENT CONCENTRATIONS OF ORGANICS AND METALS FOR SELECTED TREATMENT TRAINS

Constituent	Influent	1	2	3	4	5	6	7	8	9	10
Chloroform	7-60	7-60	5.6-48	1.0-9.0	1.0-9.0	1.0-9.0	1.0-9.0	1.0-9.0	1.0-9.0	1.0-9.0	0.1-1.0
Bromodichloromethane	0.31-1.7	0.3-1.7	0.3-1.7	0.1-.05	0.1-0.5	0.1-0.5	0.1-0.5	0.1-0.5	0.04-0.2	0.04-0.2	0.02-0.1
Dibromochloromethane	1.0-6.0	1.0-6.0	1.0-6.0	0.1-0.7	0.1-0.7	0.1-0.7	0.1-0.7	0.1-0.7	0.03-0.2	0.03-0.2	0.01-0.08
Bromoform	0.3-1.2	0.2-1.0	0.2-1.0	0.1-0.4	0.1-0.4	0.1-0.4	0.1-0.4	0.1-0.4	0.02-0.08	0.02-0.08	0.01-0.03
Carbon Tetrachloride	1.0-8.0	1.0-8.0	1.0-8.0	0.2-2.0	0.2-2.0	0.2-2.0	0.2-2.0	0.2-2.0	0.1-1.6	0.1-1.6	0.01-0.16
1,2-Dichlorethane	5.0-15.0	5.0-15.0	3.9-11.7	0.8-2.4	0.8-2.4	0.8-2.4	0.8-2.4	0.8-2.4	0.2-0.6	0.2-0.6	0.02-0.06
1,1,1-Trichloroethane	7.5-12.5	7.5-12.5	7.5-12.5	3.0-5.0	3.0-5.0	3.0-5.0	3.0-5.0	3.0-5.0	0.1-1.2	0.1-1.2	0.01-0.1
Tetrachloroethylene	1.0-4.0	1.0-4.0	1.0-4.0	0.5-2.0	0.5-2.0	0.5-20	0.5-2.0	0.5-2.0	0.05-0.2	0.05-0.2	0.05-0.2
Trichlorothylene	1.0-2.0	1.0-2.0	1.0-2.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.5-1.0	0.35-0.7	0.35-0.7	0.35-0.7
Xylene	0.06-0.2	0.06-0.2	0.06-0.2	0.03-0.1	0.03-0.1	0.03-0.1	0.03-0.1	0.03-0.1	0.01-0.03	0.01-0.03	0.01-0.03
Chlorobenzene	1.0-25.0	0.8-20.0	0.7-18.0	0.1-2.5	0.1-2.5	0.1-2.5	0.1-2.5	0.1-2.5	0.01-0.02	0.01-0.02	0.01-0.02
1,2-Dichlorobenzene	1.0-8.0	0.8-6.4	0.7-5.6	0.1-0.8	0.1-0.8	0.1-0.8	0.1-0.8	0.1-0.8	0.07-0.6	0.03-0.3	0.02-0.2
1,3-Dichlorobenzene	1.0-8.0	0.8-6.4	0.7-5.6	0.1-0.8	0.1-0.8	0.1-0.8	0.1-0.8	0.1-0.8	0.05-0.4	0.05-0.4	0.02-0.2
1,4-Dichlorobenzene	15.0-25.0	12.0-20.0	10.0-17.5	1.5-2.5	1.5-2.5	1.5-2.5	1.5-2.5	1.5-2.5	0.9-1.5	0.4-0.7	0.4-0.7	0.3-0.6
1,2,4-Trichlorobenzene	1.0-5.0	0.8-4.0	0.7-3.5	0.1-05	0.1-0.5	0.1-0.5	0.1-0.5	0.1-0.5	0.03-0.15	0.01-0.05	0.01-0.05	0.01-0.05
Ethylbenzene	0.4-15.0	0.3-13.0	0.3-9.0	0.04-1.5	0.04-1.5	0.04-1.5	0.04-1.5	0.04-1.5	0.03-1.1	0.03-1.1	0.03-1.1
Naphthalene	1.0-20.0	0.2-17.4	0.2-15.4	0.03-0.6	0.03-0.6	0.03-0.6	0.03-0.6	0.02-0.5	0.01-0.02	0.01-0.02	0.01-0.02
1-Methylnaphthalene	0.33-30.0	0.29-26.1	0.25-23.1	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.004-0.36
2-Methylnaphthalene	0.33-30.0	0.29-26.1	0.25-23.1	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.01-0.9	0.004-0.36
Dimethylphthalate	33-106	21-67	5.0-16.0	5.0-16.0	3.2-10.4	3.2-10.4	3.2-10.4	3.2-10.4	1.1-3.7	1.1-3-7	0.46-1.5
Diisobutylphthalate	20-33	12-21	3.0-5.0	3.0-5.0	1.9-3.2	1.9-3.2	1.9-3.2	1.9-3.2	0.24-0.41	0.24-0.41	0.17-0.29
Bis-(2-ethylhexyl phthalate)	66-200	41-126	10.0-30.0	10.0-30.0	6.5-19.5	6.5-19.5	6.5-19.5	6.5-19.5	5.9-17.7	5.9-17.7	2.2-6.5
PCBs	5.0-33	3.1-20.7	0.55-3.6	0.5-3.3	0.3-2.6	0.3-2.6	0.3-2.6	0.3-2.6	0.1-0.3	0.1-0.3	0.1-03
Arsenic	9-22	9-22	9-22	8-20	5.6-14.0	5.6-14.0	5.0-12.6	1.4-3.6	5.0-12.6	1.4-3.6	<MDL
Barium	120-160	120-160	120-160	60-80	60-80	60-80	60-80	60-80	60-80	60-80	2.0-5.0
Boron	300-500	300-500	300-500	300-500	300-500	300-500	300-500	300-500	300-500	300-500	100-300
Cadmium	6.6-22.2	5.8-19.5	5.8-19.5	3.0-10.0	2.2-7.3	2.2-7.3	2.2-7.3	1.4-4.7	2.1-6.9	1.3-4.5	0.7-2.0
Chromium	160-320	149-297	137-275	40-80	12-24	12-24	9-18	8-16	5.4-10.8	4.8-9.6	0.2-2.0
Copper	167-267	134-214	94-150	50-30	31-50	31-50	31-50	15-24	15-25	7.0-12.0	1.0-10.0
Iron	600-1600	600-1600	300-800	300-800	150-400	150-400	120-320	30-80	84-224	21-56	20-30
Lead	100-150	70-105	50-80	40-60	32-48	32-48	27-41	18-27	16-25	11-16	1.0-3.0
Manganese	41-81	37-73	33-65	30-60	21-42	21-42	17-34	5.6-11.2	13.6-27.2	5.0-10.0	1.0-4.0
Mercury	0.25-2.5	0.2-2.0	0.2-2.0	0.1-1.0	0.08-0.8	0.08-0.8	0.08-0.8	0.07-0.7	0.06-0.6	0.05-0.5	<MDL
Nickel	93-147	88-140	79-126	70-110	60-95	60-95	60-95	49-77	50-79	41-64	4.0-10.0
Selenium	4.2-15.0	3.8-13.5	3.8-13.5	1.0-3.5	0.9-3.1	0.9-3.1	0.7-2.6	0.6-2.1	0.35-1.3	0.3-1.1	<MDL
Silver	0.4-6.7	0.4-6.7	0.4-6.7	0.2-3.0	0.2-3.0	0.2-3.0	0.2-3.0	0.12-1.8	0.2-3.0	0.12-1.8	0.1-1.2
Zinc	250-400	225-360	225-360	100-160	70-112	70-112	70-112	40-64	45-73	34-54	5.0-30.0

NOTE: Influent values attempt to be representative of concentrations entering POTWs. However, values can be quite variable depending on the nature of the service area. Adapted from NRC (1993).
MDL = minimum detection level

6. Analyze all of the alternatives presented as alternatives 1 through 5, and determine which one or which combination of alternatives is best for the site in question.

The RWQCBs should be given significant latitude in determining which alternative action to select for a site. While we believe that the list of alternatives is complete there will likely be a circumstance that was not taken into consideration. Therefore the RWQCBs should consider other alternatives and be allowed to identify other methods and associated costs to fit site-specific conditions. Since cost of remediation is site-specific, the RWQCBs should give a range of values in the cleanup plans.

The RWQCBs should also be required to plan for post-remediation monitoring to assess the effectiveness of the remediation.

Sediment Cleanup Costs

Total costs for various remedial technologies is dependent upon many factors, some of the most important being pollutant concentration, cleanup level, physical characteristics of the sediment, and the volume of material to be remediated. In addition, overall costs of remediation should also include monitoring to evaluate the effectiveness of cleanup. Due to the large number of variables associated with remedial actions and availability of disposal sites, the costs for any cleanup will be project specific.

Tables 18 and 19 provide a qualitative assessment of the various categories of technology. Table 20 contains estimates of the various costs associated with several cleanup methods from studies in the San Francisco Bay Region. The costs listed should not be considered as absolute for specific remediation methods.

RWQCBs should use either the estimates in Table 18 and Table 19 or obtain new, project-specific estimates of cleanup costs. The RWQCBs may obtain outside estimates of costs, if necessary (such as those presented in Table 20). Obtaining new estimates will allow a more realistic comparison of the cost-effectiveness benefit of the selected alternative.

Wastewater Remediation Costs

The costs for implementing the waste water treatment technologies and best management practices are discharge- and site-specific. In

developing estimates the RWQCBs shall use the EPA Treatability Manual (EPA, 1983), applicable National Research Council reports (e.g., NRC, 1993), site-specific estimates for BMPs or treatment technologies, or delay the development of cost estimates if the toxic hot spot will be addressed as a part of a watershed management effort. Examples of general costs estimates for the wastewater treatment trains (from Table 15) are presented in Tables 21 and 22. The costs estimated in Tables 21 and 22 assume an 8 percent interest rate for a 20 MGD facility with a design period of 20 years and to not consider the cost of land or sludge disposal (NRC, 1993). These tables and estimates are provided only as examples of the types of information that should be produced in evaluating wastewater treatment.

If cost estimates are delayed the RWQCBs shall develop cost estimates for developing and coordinating the watershed planning effort.

Benefits of Remediation

In developing the regional toxic hot spot cleanup plans the RWQCBs should list the benefits that will be derived by remediating candidate toxic hot spots. Since the costs of remediating sites will be presented, it would assists the RWQCBs and the SWRCB in making their decision on the remediation if the potential benefits of the remediation are presented. It is acknowledged that the benefits to be developed by the RWQCBs are qualitative estimates. The list of possible qualitative benefits of remediation are presented in Table 23.

Staff Recommendation: Adopt Alternative 6.

TABLE 18: QUALITATIVE COMPARISON OF THE STATE OF THE ART IN REMEDIATION TECHNOLOGIES

Feature technology	State of Design Guidance	Number of Times Used	Scale of Application	Cost (per cubic yard)	Limitations
Natural recovery	Nonexistent	2	Full scale.	Low.	Source control Sedimentation Storms.
In place containment	Developing rapidly	<10	Full scale.	<$20.	Limited technical guidance. Legal/regulation uncertainty.
In place treatment	Nonexistent	~2	Pilot scale.	Unknown.	Technical problems Few proponents Need to treat entire volume.
Excavation and containment.	Substantial and well developed	Several hundred	Full scale.	$20 to $100.	Site availability Public assistance.
Excavation and treatment	Limited and extrapolated from soil	<10	Full scale.	$50 to $1,000.	High cost Inefficient for low concentration Residue toxic Need for treatment train.

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TABLE 19: COMPARATIVE ANALYSIS OF TECHNOLOGY CATEGORIES

Approach	Feasibility	Effective	Practicality	Cost
INTERIM CONTROL				
Administrative	0	4	2	4
Technological	1	3	1	3
LONG-TERM CONTROL				
In Situ				
Natural recovery	0	4	1	4
Capping	2	3	3	3
Treatment	1	1	2	2
Sediment Removal and Transport	2	4	3	2
Ex Situ Treatment				
Physical	1	4	4	1
Chemical	1	2	4	1
Thermal	4	4	3	0
Biological	0	1	4	1
Ex Situ Containment	2	4	2	2

SCORING	**Feasibility**	**Effective**	**Practicality**	**Cost**
0	<90%	Concept	Not acceptable, very uncertain	$1,000/yd
1	90%	Bench		$100/yd
2	99%	Pilot		$10/yd
3	99.9%	Field		$1/yd
4	99.99%	Commercial	Acceptable, certain	<$1/yd

TABLE 20: ESTIMATED COST RANGES FOR SEDIMENT REMEDIATION

		Alternatives	Volume	Cost/cy
I.	Removal			
	A. mechanical			
	1.	dipper[4]	1 cy	$1 - 25
	2.	bucket ladder[4]	1 cy	$1 - 25
	3.	dragline[4]	1 cy	$1 - 25
	4.	clamshell[2]	1 cy	$10 labor
	B. hydraulic			
		silt screen[3]	10,000 sf	$30,000 mat/labor
	1.	plain suction[2,3]	1 cy	$7 - 10 labor
	2.	cutterhead[4]	1 cy	$7 - 10
	3.	dustpan		
	C.	pneumatic[4]	1 cy	>$10
II.	Transport (may depend upon if hazardous waste, and will affected by dredge and treatment selection)			
	A.	pipeline	TBD*	TBD
	B.	barge[4]	TBD	TBD
	C.	rail[3]	1 Ton	$53 (includes 1500 miles of transportation and upland disposal of non-hazardous pollutants)
	D.	truck[2]	1 cy	$200

TBD = to be determined

Table 20
(Continued)
Estimated Cost Ranges for Sediment Remediation

Alternatives	Volume	Cost
III. Pre-Treatment		
A. dewatering pumping[3]	1 cy	$0.05 labor
1. air drying		
a. construct upland drying area	(size dependent)[2]	$5,000 labor
wick drains, subdrain blanket[3]	1 sf or lf	$1 materials
b. condition dredged sediment[3]	1 cy	$4 - 7 mat/labor
2. mechanical		
a. filtration[5b]	1 cm	$6
b. centrifuge[7]	1 cm	<$6
c. gravity thickening[7]	1 cm	<$6
B. particle classification: for #2, 3, 4, and 5 below[5b] (sorting and separating)	1 cy	$6 - 100
1. impoundment basins	1 cy	$6 - 100
2. hydraulic classifiers	1 cy	$6 - 100
3. hydrocyclones	1 cy	$6 - 100
4. grizzlies	1 cy	$6 - 100
5. screens	1 cy	$6 - 100

Table 20
(Continued)
Estimated Cost Ranges for Sediment Remediation

Alternatives	Volume	Cost
C. slurry injections (may overlap with other treatment technologies)		
1. chemicals	TBD	TBD
2. nutrients	TBD	TBD
3. microorganisms	TBD	TBD
IV. Treatment (in some cases, costs associated with any particular treatment will be dependent upon pollutant concentration and cleanup levels required. Some of these technologies have been performed on sediments at the bench or pilot scale only, and are not proven for full scale.)		
A. biological		
1. biodegradation/bioremediation[5b]	1 ton	$25 - 100
B. physical		
1. solidification/stabilization[5]	1 cy	< $100
C. chemical		
1. chelation, chemical hydrolysis, detoxification[5a]	1 cy	$200-300
2. solvent extraction[5b]	1 ton	$50 -150
3. electrokinetic soil washing[5b]	1 cy	$100-300

Table 20
(Continued)
Estimated Cost Ranges for Sediment Remediation

Alternatives	Volume	Cost
D. thermal		
1. rotary kiln incineration[1]	< 6,700 cy	$675 - 2,025
	6,750 - 20,250 cy	$405 - 1,215
	20,250 - 40,500 cy	$270 - 810
	> 40,500 cy	$135 - 540
2. cyclone furnace vitrification[5b]	1 ton	$450 - 530
3. fluid bed incineration[5b]	1 ton	$50 - 175
V. Disposal		
A. onsite upland[6] (includes unspecified dredging method and disposal)	1 cy	$3 - 4
B. offsite land		
wetlands creation[6]	1 cy	$10 - 20
class I disposal facility[5] (does not include hazardous waste generator fees)	1 ton	$200 - 300
class II disposal facility[5]	1 ton	$55 - 65
class III disposal facility[5]	1 cy	$30 - 40
C. aquatic		
1. confined	TBD	TBD

Table 20
(Continued)
Estimated Cost Ranges for Sediment Remediation

Alternatives		Volume	Cost
2.	unconfined		
a.	in-bay[6] (includes unspecified dredging method **and** disposal)	1 cy	$2 - 3
b.	in-bay[6] (includes clamshell dredging **and** disposal)	1 cy	$1 - 8
c.	ocean[6] (includes unspecified dredging method **and** disposal)	1 cy	$5 - 9
VI. Effluent/Leachate Treatment			
1.	set up carbon absorption system[2,3] (for organics)	1 system	$25,000 -30,000 mat/labor (does not include O&M)

Table 20
(Continued)
Estimated Cost Ranges for Sediment Remediation

References:

[1] US EPA Office of Research and Development, *Contaminated Sediments Seminar* CERI-91-19, May 1991

[2] *Feasibility Study for the United Heckathorn Site, Richmond, California,* prepared by Levine Fricke - Emeryville, California, January 11, 1991

[3] *Feasibility Study for the United Heckathorn Superfund Site, Richmond, California,* prepared by Batelle/Marine Sciences Laboratory, Sequim, Washington, July 1994

[4] US EPA Office of Water, *Selecting Remediation Techniques for Contaminated Sediment* EPA-823-B93-001, June 1993

[5] Draft Report - Long-Term Management Strategy, *Analysis of Remediation Technologies for Contaminated Dredged Material,* prepared by Gahagan & Bryant Associates, Inc., Novato California in association with ENTRIX, Inc. Walnut Creek, California, October 25, 1993 (includes review and analysis of other documents:

[a] Texas A & M *Proceedings of 25th Annual Dredging Seminar* ;

[b] *Sediment Treatment Technologies Database (SEDTEC),* 2nd edition; Site Remediation Division, Wastewater Technology Centre, operated by Rockcliffe Research Management, Inc.) - submitted by technology developers and vendors from around the world;

[6] Long-Term Management Strategy Dredging Costs Survey for San Francisco Bay, Tom Gandesbery, RWQCB Region 2, personal communication June 1994

[7] US EPA Office of Research and Development, Handbook/Remediation of Contaminated Sediments, EPA/625/6-91/028, April 1991.

TABLE 21: COSTS FOR SYSTEMS 1-4

	Primary (1)	Low-dose Chemical Primary (2a)	High-Dose Chemical Primary (2b)	Biological (3)	Low-Dose Chemical Primary + Biological (4)
Capital Cost ($/gpd)	0.9-1.1	1.1-1.4	1.2-1.8	2.4-2.6	2.6-2.9
Capital Cost ($/MG)	245-310	320-400	400	610-720	750-870
O & M Cost ($/MG)	205-240	230-280	250-350	320-410	350-450
Total Cost ($/MG)	450-550	550-680	650-750	930-1,130	1.050-1,150

Adapted from NRC. 1993. Managing wastewater in coastal urban areas. Committee on Wastewater Management for Coastal Urban Areas, Water Science and Technology Board. Commission on Engineering and Technical Systems, National Research Council. National Academy Press, Washington, D.C.

TABLE 22: COSTS FOR SYSTEMS 5-10

	Nutrient Removal (5)	Nutrient Removal + Filtration (6)	Nutrient Removal + High Lime + /filtration (7)	Nutrient Removal + Filtration + GAC (8)	Nutrient Removal + High Lime + Filtration + GAC (9)	Nutrient Removal + High lime + Filtration + GAC + Reverse Osmosis (10)
Capital Cost ($/gpd)	2.9-3.3	3.5-3.9	5.2-5.6	4.5-4.9	6.1-6.7	6.5-9.5
Capital Cost ($/MG)	750-870	890-1,140	1,300-1,700	1,150-1,450	1,500-1,800	7,000-2,500
O & M Cost ($/MG)	500-580	560-660	1,100-1,300	850-950	1,350-1,650	2,500-3,000
Total Cost ($/MG)	1,250-1,450	1,450-1,800	2,400-3,000	2,000-2,400	2,900-3,500	4,500-5,500

Adapted from NRC. 1993. Managing wastewater in coastal urban areas. Committee on Wastewater Management for Coastal Urban Areas, Water Science and Technology Board, Commission on Engineering and Technical Systems, National Research Council. National Academy Press, Washington, D.C.

TABLE 23. BENEFICIAL EFFECTS OF REMEDIATION

Beneficial effect	Values quantifying these beneficial effects	Beneficial use* affected
Lower toxicity in planktonic and benthic organisms	Greater survival of organisms in toxicity tests.	MAR, EST
Undegraded benthic community	Species diversity and abundance characteristic of undegraded conditions.	MAR, EST
Lower concentrations of pollutants in water	Water column chemical concentration that will not contribute to possible human health impacts.	MIGR, SPWN, EST, MAR, REC 1, REC 2
Lower concentrations of pollutants in fish and shellfish tissue	Lower tissue concentrations of chemicals that could contribute to possible human health and ecological impacts.	MAR, EST, REC 1, COMM
Area can be used for sport and commercial fishing	Anglers catch more fish. Impact on catches and net revenues of fishing operations increase.	REC 1, COMM
Area can be used for shellfish harvesting or aquaculture	Jobs and production generated by these activities increase. Net revenues from these activities are enhanced.	SHELL, AQUA
Improved conditions for seabirds and other predators	Increase in populations. Value to public of more abundant wildlife.	WILD, MIGR, RARE
More abundant fish populations	Increase in populations. Value to public of more abundant wildlife.	MAR, EST
Commercial catches increase	Impact on catches and net revenues of fishing operations.	COMM
Recreational catches increase, more opportunities for angling	Increased catches and recreational visitor-days.	REC 1
Improved ecosystem conditions	Species diversity and abundance characteristic of undegraded conditions.	EST, MAR
Improved aesthetics	Value to public of improved aesthetics. In some cases, estimates of the value to the public of improved conditions may be available from surveys.	REC 2
More abundant wildlife, more opportunities for wildlife viewing	Impact on wildlife populations. Impact on recreational visitor-days.	MAR, WILD, RARE, REC 2

*Memorandum from Walt Pettit to the RWQCB Executive Officers. 1993. Revised beneficial use definitions. SWRCB, Sacramento, CA.

Issue 6: ***Toxic Hot Spot Prevention Strategies***

Present Policy: None.

Issue Description: Various factors influence the ability to implement prevention measures in identified toxic hot spots in bays and estuaries. The most important factors among others are: land use practices, type of pollutant affecting the site, areal extent of the site, and whether responsible party or parties are willing or able to implement the necessary control measures to prevent a THS or its recurrence.

There are three possible types of prevention tools that can be used in preventing and/or remediate toxic hot spots. These consist of (1) Voluntary tools which include actions that can be taken at the community level, (2) Interactive Cooperative Programs involving funds to entice private and public agencies to do prevention projects and activities, and (3) Regulatory Actions, taken in compliance with various existing regulatory programs currently in force throughout the State.

These implementation tools can be put to use in two ways: (1) The point source pollution control management strategy which achieves pollution control through the imposition of waste discharge permits, prohibitions and/or enforcement actions, and (2) Watershed Management Planning strategy which uses a multi-disciplinary, multi-regulatory integrated approach to achieve effective protection while allowing the flexibility to address specific problems within the context of a watershed. The question is to determine which process provides the possibility of achieving the best solutions to address point and nonpoint source of pollution in the receiving waters and sediment of bays and estuaries.

Alternatives: 1. Point Source Pollution Control Strategy Only

Historically, this is the way point source pollution control has been carried out, by applying a permitting process, imposing effluent limits on wastewater discharges, establishing prohibitions, and taking enforcement actions whenever it has been necessary. Other water quality protection strategies have been available through the State and RWQCB system and in other federal and state agencies

but they tend to be applied in an independent fashion. Unfortunately, each potential prevention tool, has been conceived independently adopted through different legislation, forming distinct portions of different programs. Many potentially useful prevention Strategies reside in different agencies with different authorities. Each has been designed to address specific problems and/or sources of pollution, all are usually funded differently and therefore applied independently.

Toxic hot spot prevention requires not only control of point sources of pollution but even more importantly control over nonpoint sources as well. This requires a broader more coordinated approach. Proper prevention control requires the use of flexible and integrated strategies in order to effectively remediate and prevent the reoccurrence of polluted sites in bays and estuaries. The present way of implementing water quality controls confines activities to agencies, programs or geographical jurisdictions and does not promote the application of a coordinated water quality protection approach.

This option, in effect, does not require endorsement of any different approach. Toxic hot spot prevention is achieved through the application of existing control strategies.

2. Watershed Management Planning

Watershed management is a comprehensive strategy that can make possible the implementation of cost effective integrated control actions that can effectively achieve the protection necessary to maintain and restore beneficial uses of watershed as a whole.

For a given watershed, not only all hydrologic resources are considered (streams, lakes, groundwater basins, bays and estuaries) but also all land use practices being applied in the watershed as well. Interdisciplinary work groups that are able to cross over geographical and political boundaries to identify water quality problems prioritized them, and develop effective solutions. Solutions developed can be applied from the whole watershed perspective, that is, problem solutions are applied where they will do the most good from the watershed perspective.

This process also allows for dischargers, landowners, business owners, environmental groups, non-profit groups, and other members of an affected community to discuss the watershed issues and get involved in seeking practical, cost effective solutions to the watershed identified THSs. Such meetings help in the exchange of information, ideas, and expertise among different representations resulting in effective and more easily implementable management practices. Solutions developed could be unique to the watershed or they could be composed of a specific combination or modification of existing practices.

Effective prevention of sediment and water quality degradation in bays and estuaries requires a broad approach where all point and non-point sources of pollution from various land use activities are taken into consideration. A watershed management planning approach allows for the development of management practices that can address specific problems within a watershed area overcoming the barriers imposed by geography and different political jurisdictions. This promotes interaction and cooperation among all concerned parties which can result in a more comprehensive and effective solutions to solve water quality problems within a hydrologically defined watershed basin.

To address toxic hot spots, watershed management should involve implementation of voluntary, cooperative agreements and regulatory programs to address identified problems. Several existing State and Federal programs should be considered in developing prevention strategies as follows.

Voluntary Programs

Voluntary actions ideally represent the preferred approach for addressing toxic hot spots mitigation and prevention upon bays and estuary environments. Community based planning efforts, such as the Coordinated Resources Management Planning (CRMP) groups and Watershed Advisory Groups (WAGs), offer a forum through which information about a particular bay or estuary may be distributed and obtained.

Interactive Cooperative Programs

Interactive Cooperative Programs can be effective in developing comprehensive pollution prevention strategies among private and public agencies by providing ways that will encourage involvement, promote interagency cooperation and aid in the development of coordinated approaches to take pollution prevention steps. There are three types of Interactive Cooperative Programs. These can be categorized as follows; Interagency Agreements, Funding Programs and Federal Programs.

Interagency Agreements

Interagency Agreements, in the form of Management Agency Agreements (MAAs), and Memorandum of Understanding (MOUs) can provide effective cooperation and regulatory coordination among regulatory or planning agencies with different statutory jurisdiction. Such Interagency Agreements are useful in defining each agency's authority, responsibility and level of coordination in implementing mitigating and preventive water quality control measures.

Management Agency Agreement (MAA) with the Department of Pesticide Regulation (DPR) and the Pesticide Management Plan (PMP)

The SWRCB and DPR entered into a MAA in March 1997 to eliminate duplication of effort and inconsistency of action dealing with pesticide use and water quality. The PMP describes how DPR and the County Agriculture Commissioners will work in cooperation with the SWRCB and the RWQCBs to protect water quality from the use of pesticides. The PMP contains, among other things, provisions for outreach, compliance with water quality objectives, ground and surface water protection, self-regulatory and regulatory compliance.

Funding Programs

There are several federal and state funding programs currently in place that can be useful in encouraging the development of pollution prevention actions. These include the following:

Nonpoint Source Grants Clean Water Act(CWA) Section 319

The Clean Water Act (CWA), Section 319(h), provides grant funds for projects directed at the management of nonpoint source pollution. High priority projects are considered those which implement specified nonpoint source management practices under Section 319 requirements, and projects which address nonpoint source waters listed pursuant to CWA section 303(d), water quality limited segments (see TMDL discussion, below).

Water Quality Planning (CWA §205(j))

Section 205(j) of the Clean Water Act (CWA) allows each state to provide funding for water quality management and planning projects. In addition, Congress has provided funding under Section 604(b), State Revolving Fund Set-Aside. Any regional or local public agency may apply directly to the State Board for 205(j) project funding. The State Board, Division of Water Quality, Water Quality Planning Unit and Regional Board Planning staff, administer this grant program.

Wetlands Grants

Section 104(b) of the Clean Water Act provides funds for wetland restoration. The focus of these grants is wetland protection, but wetland restoration can be included when it is part of an overall wetland protection program. Priorities for funding include watershed projects to address watershed protection which have a substantial wetlands component in a holistic, integrated manner, and development of an assessment and monitoring.

State Revolving Funds (SRF) Loan Program

The State Revolving Funds (SRF) Loan Program provides funding for the construction of publicly-owned treatment works (POTWs), for nonpoint source correction programs and projects, and for the development and implementation of estuary conservation and management programs. The loan interest rate is set at one-half the rate of the most recent sale of a State general obligation bond.

Agricultural Drainage Management Loan Program

The State Agricultural Drainage Management Loan Program funds are available for feasibility studies and the design and construction of agricultural drainage water

management projects. The project must remove, reduce, or mitigate pollution resulting from agricultural drainage.

CALFED

The CALFED Bay-Delta Program was initiated in 1995 to address environmental and water management problems associated with the Bay-Delta system, an intricate web of waterways created at the junction of the San Francisco Bay and the Sacramento and San Joaquin rivers and the watershed that feeds them. The CALFED Bay-Delta Program is carrying out a process to achieve broad agreement on comprehensive solutions for problems in the Bay-Delta System.

Federal Programs

Nonpoint Source Best Management Practices

As defined in 40 CFR 103.2 (M). BMPs are; "Methods, measures or practices selected by an agency to meet its nonpoint source control needs. BMPs include, but are not limited to structural and nonstructural controls, and operation and maintenance procedures. BMPs can be applied before, during and after pollution producing activities to reduce or eliminate the introduction of pollutants into receiving waters."

BMPs fall into two general categories: Source Controls which prevent a discharge or threatened discharge. Recycling, fertilizer management, erosion control and physical barriers to prevent livestock impacts are considered source control measures. Treatment Controls measures remove pollutants from the nonpoint source before it reaches the waterbody of concern. Examples include, created wetlands, sedimentation basins and oil/water separators.

Total Maximum Daily Loads (TMDLs)

Section 303(d) of the Clean Water Act requires States to identify water bodies that do not meet water quality standards after technology based control has been implemented. These water bodies may be impacted by conventional or toxic pollutants from either point or nonpoint sources and are designated Water Quality Limited Segments. Once these water bodies are identified, states are required to develop Total Maximum Daily Loads

(TMDLs) and a Waste Load Allocation or Load Allocation as a strategy for reducing the contaminant load. The Waste Load Allocation and Load Allocation refer to the quantity of pollutant that can be added to waterbody and still maintain the beneficial use. The TMDL allocates a portion of the load to point sources (Waste Load Allocation), nonpoint sources (Load Allocation) with a margin of safety.

National Estuary Program

As specified in the Clean Water Act, Section 320, significant coastal estuaries and water bodies may be nominated by the Governor and accepted into the National Estuary Program by the Environmental Protection Agency. It must be demonstrated that the waterbody is of national significance from both an ecological and a public health standpoint.

The purpose of the program is to establish a mechanism for coastal protection. Acceptance into the National Estuary program provides a formal structure for developing water quality protection mechanisms, and may be an effective tool for initiating pollution prevention programs. Water bodies in the National Estuary Program are targeted for the development of comprehensive conservation and management plans that recommend priority corrective actions and compliance schedules addressing point and nonpoint source pollution. These plans must also propose methods to restore the chemical, physical and biological integrity of the estuary, as well as assure that beneficial uses are protected.

Regulatory

The following State and federal regulatory activities are carried out by the State and Regional Boards. These programs contain water quality protection enforcement provisions that must be complied with before operations are allowed to proceed. These programs, either require WDRs (or permits) containing specific provisions or require the strict adherence to specific operating procedures in order to provide appropriate water quality protection to a target receiving water. They have been identified and described on the basis of (1) information provided by each program that can be useful in the prevention of toxic hot spots and their recurrence, and (2) how these regulatory activities can

be useful in providing component tools (mechanisms and process) to help prevent toxic hot spots.

Waste Discharge Requirements and the National Pollutant Discharge Elimination System (NPDES) Program

The Regional Water Boards issue waste discharge requirements orders which incorporate Federal Clean Water Act (CWA) provisions (NPDES Permits) and Porter-Cologne Act regulatory provisions to regulate point source discharges to navigable waters of the U.S. (streams, rivers, lakes, or coastal waters) and ground waters of the state. The permits are implemented in California through a cooperative program with the U.S. EPA and the state and RWQCBs. As a result, the issuance of waste discharge permits satisfies both State and Federal law. The regulatory provisions of the permits include the authority to issue the permits for a fixed term not to exceed five years. The regulation provides authority for inspection and monitoring. It also provides for a pretreatment program which authorizes the state to impose pretreatment standards on industrial users of POTWs.

During the issuance process, the RWQCB staff analyzes the discharge and prepares waste discharge requirements for Board adoption. The requirements must implement the water quality control plans and policies to protect beneficial uses of the receiving waters. Monitoring data provided by the permit program can provide information about possible toxic hot spots. Stricter effluent limits can help remediate and prevent recurrence of toxic hot spots in some cases. The imposition of appropriate effluent standards may help to prevent toxic hot spots.

Coastal Zone Act/Coastal Zone Act Reauthorization Amendments (CZARA)

In passing into law the CZARA, Congress identified nonpoint source pollution as a significant factor in coastal water degradation. This acknowledgment links coastal water quality with land use activities along the shore. Section 6217 now requires that states with approved coastal zone management programs develop a coastal nonpoint source pollution control program as well. The management measures are being evaluated and ultimately the program developed will: (1) identify those land uses that individually or cumulatively may cause or contribute

significantly to a degradation of a coastal water, (2) identify critical geographical areas adjacent to coastal waters and (3) implement measures to achieve and maintain water quality standards.

Clean Water Act Section 404 and 401

Section 404 of the Clean Water Act prohibits the discharge of dredge or fill materials into navigable waters of the U.S. unless a permit is obtained from the U.S. Army Corps of Engineers. The U.S. EPA has oversight and veto authority over the Corps determination to issue the permit if it finds that the proposed project will have adverse effects on the receiving waters. Section 401 of the CWA requires that any federally permitted activity issued under CWA Section 404 complies with the States adopted water quality objectives and effluent limitations. Under this section the State, through the SWRCB must issue the water quality certification. The water quality certification declares that the proposed activity will be conducted using prescribed technology and that it will not result in any violation of any effluent limitations or water quality objectives. Until such a certification is issued, denied or waived by the SWRCB the proposed project can not proceed.

Storm Water Program

The 1987 amendments to the Clean water Act added Section 402(p) to the already existing NPDES program. The new section established a framework to regulate municipal and industrial storm water discharges to surface waters or through municipal separate storm sewers. The SWRCB currently issues general permits to regulate all storm water discharges.

Owners or operators of industrial storm water discharge system must obtain authorization for the use or continued use of storm water discharge systems by submitting a "Notice of Intent", which signifies that the discharger intends to comply with the provisions of the general permit. The general permit authorizes the discharge of industrial storm water from industrial facilities, prohibits illicit connections and discharges containing hazardous substances in storm water in excess of reportable quantities prescribed by federal regulation.

The actual permit process could help prevent toxic hot spots from these permitted activities.

Staff Recommendation: Adopt Alternative 2.

Toxic Hot Spot Cleanup Plans should be written such that actions taken either to remediate or prevent toxic hot spots use an integrated and coordinated management protection approach. A watershed strategy should encompasses all waters surface, ground, inland and coastal and address point and nonpoint sources of pollution.

The Cleanup Plans should also be written to take into account and accommodate the water quality control priorities identified by already established local watershed plans. Wherever watershed plans are established, toxic hot spots cleanup plans should serve as a supplementary documents recommending different approaches to prevent toxic hot spots in the bays and estuaries of a particular watershed. In cases where a watershed plan is not in place the toxic hot spot cleanup plans should serve to provide guidance in implementing appropriate controls to prevent toxic hot spots.

Please refer to Pages "xlvii" through "xlviii" of this document for the provisions related to toxic hot spot prevention.

ENVIRONMENTAL EFFECTS OF THE PROPOSED POLICY

This section provides an analysis of potential adverse environmental effects of SWRCB adoption of the Water Quality Control Policy on guidance for development of the BPTCP cleanup plans. The SWRCB and the RWQCBs will use a three phase process for adoption of the Regional and Statewide Toxic Hot Spot Cleanup Plans. The three phases are:

1. The SWRCB will adopt a policy outlining the toxic hot spot definition, ranking criteria and other factors needed for the consistent development of the BPTCP cleanup plans (as presented in this program FED).

2. The RWQCBs will adopt the regional toxic hot spot cleanup plans.

3. The SWRCB will compile and adopt the consolidated toxic hot spot cleanup plan. The SWRCB will develop a FED to facilitate CEQA and APA compliance. The SWRCB will use the same procedures used for adoption of the Policy in Phase 1 for adoption of the Statewide consolidated toxic hot spot cleanup plan. Any environmental impacts identified in the development of the Regional toxic hot spot cleanup plans will be evaluated when the consolidated toxic hot spot cleanup plan is considered by the SWRCB.

The analysis that follows identifies differences between existing RWQCB practices under current Water Code provisions and the proposed Policy, and the potential environmental effects of these differences. Also, this analysis examines whether adoption of the proposed Policy would change anything and, if so, does the change have the potential for significant adverse effects.

After evaluating the potential adverse effects of each of the issues in the proposed Policy, no issues were found to have the potential for significant adverse environmental effects.

Baseline

The baseline is the existing physical conditions under current RWQCB practices for addressing polluted water and sediments. The baseline is what is now occurring in the absence of the proposed Policy.

At present, the SWRCB and the RWQCBs have a variety of options for addressing polluted water and sediments in the absence of the BPTCP and the requirements for toxic hot spot cleanup plans. The various bases for regulation of toxic pollutants and their implementation procedures are discussed below.

The SWRCB and the RWQCBs implement State (Porter-Cologne Act) and Federal law (Clean Water Act) for the protection of water quality. The RWQCBs regulate point discharges through Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permits. Because the SWRCB and the RWQCBs operate the NPDES permit program in California, one permit is usually issued to point dischargers to comply with State and Federal statute. For nonpoint dischargers, the RWQCBs can issue WDRs to protect beneficial uses. The current functions of the SWRCB and the RWQCBs are described below.

Planning

The RWQCBs have Water Quality Control Plans for their Regions (Basin Plans). The plans contain inventories of beneficial uses of the waters in the regions and water quality objectives to ensure reasonable protection of the beneficial uses. The plans also contain an implementation program to achieve the water quality objectives. This program can include the actions necessary to achieve water quality objectives, a time schedule for the actions, and descriptions of the monitoring necessary to determine compliance with objectives.

The SWRCB can adopt State policies for water quality control or statewide water quality control plans. Policies contain water quality principles and guidelines for long range resource planning, including surface water management. Policies may also contain water quality objectives. RWQCB basin plans must conform to all SWRCB Policies.

Plans and Policies are implemented through the issuance of WDRs, NPDES permits, cleanup and abatement orders, and other enforcement actions.

WDRs and NPDES Permits

All dischargers of waste to the waters of the State must apply for and receive from a RWQCB a WDR. This document lists what can and can not be discharged to the waters of the State. WDRs implement water quality control plans and are intended to protect the beneficial uses of receiving water. WDRs are adopted by RWQCBs after interested parties and the discharger has had an opportunity to comment on the provisions of the WDR.

The issuance of WDRs satisfies the requirements of both State and Federal law. Consequently, for a point discharger WDRs are considered to be a NPDES permit. Under the Water Code (Chapter 5.5) the RWQCBs have the authority to issue NPDES permits for a fixed term not to exceed five years. Other authorities include inspection and monitoring, notice to the public, notice to the U.S. EPA, notice to any other affected state, protection of navigation, enforcement, a pretreatment program, and necessary enforcement authorities.

The RWQCBs regulate nonpoint source discharges of pollutants to surface waters primarily through application of the SWRCB's Nonpoint Source Management Plan (NPS Plan). The NPS Plan provides a policy for addressing all types of nonpoint source discharges (such as agricultural return flows). The NPS Plan gives the RWQCBs the discretion to determine which of three options, individually or in combination, should be used to address a nonpoint source pollution problem. The options are: (1) voluntary implementation by dischargers of best management practices (BMPs); (2) regulatory actions by RWQCBs to encourage dischargers to implement BMPs; and (3) RWQCB issuance of effluent limitations in WDRs.

Enforcement

RWQCBs have a variety of enforcement actions that they can use to ensure that WDRs and NPDES permits are met. The actions can be administrative (actions taken by the

RWQCB) or judicial (considered in the courts after referral to the State Attorney General). The enforcement actions listed below are at the discretion of each RWQCB, and, as a result, there may not be strict uniformity as to method or level of enforcement from Region to Region.

Administrative Civil Liability

The process of imposing administrative civil liability orders begins when the RWQCB staff issues a complaint to an alleged violator for discharging waste, for failure to furnish or furnishing false technical or monitoring reports, for various cleanup and abatement violations, and other issues. These orders are based on the violation of a WDR, a NPDES permit, or a prohibition in a water quality control plan.

Cease and Desist Orders

These orders are based on the violation of a WDR, a NPDES permit, or a prohibition in a water quality control plan. The violation can be actual or threatened. The order itself must be adopted by the RWQCB.

Cleanup and Abatement Orders

This type of order directs a discharger to do or not do something. The cleanup and abatement order can be based upon a violation of existing regional board orders (e.g., WDRs) or where someone has discharged waste or threatens to discharge waste. The effect of the order is to cleanup the waste discharged or abate the effects of the waste, or in the case of threatened pollution or nuisance, to take other remedial action.

Potentially Significant Adverse Environmental Effects

The proposed Policy was evaluated in terms of the baseline described above. The analysis of each issue is formatted consistently as described below.

1. Existing RWQCB Practices.

   This section provides a brief description of how RWQCBs currently address this issue.

2. Proposed Policy.

   This section provides a brief description of how the Policy addresses the issue and a brief description of why the Policy was developed this way.

3. Differences Between the Policy and Existing Practices.

   Differences between (1) and (2).

4. Potential Adverse Environmental Effects.

   What are the potential effects of the differences between the proposed Policy and the existing RWQCB practices?

5. Potentially Significant Adverse Environmental Effects.

   Are any anticipated potential adverse environmental effects in (4) significant?

Issue 1: **Authority and Reference for Guidance on Developing Toxic Hot Spot Cleanup Plans**

1. Existing RWQCB Practices.

   Currently, the Water Code requires the RWQCBs to develop Regional toxic hot spot cleanup plans. The plans are required to contain the following information: (1) ranked list of all toxic hot spots, (2) estimate of areal extent of each toxic hot spot, (3) estimate of likely sources of pollution at the toxic hot spot, (4) summary of actions initiated by the RWQCB at the site, (5) preliminary list of actions to remedy the toxic hot spot, (6) estimate of costs to implement actions, (7) estimate of costs recoverable from dischargers, and (8) expenditure schedule. The provisions of the Water Code are not very specific with respect to these factors.

2. Proposed Policy.

   The proposed Policy would limit flexibility in interpretation of the Water Code and would ensure

consistent development of the toxic hot spot cleanup plans on a Statewide basis. The proposed Policy allows for site-specific variances similar to the exception processes in Statewide Plans and regulations. Variance provisions are needed in site-specific circumstances where the Policy cannot be implemented by the RWQCBs.

This approach was selected because it provided Statewide consistency in the development of the regional toxic hot spot cleanup plans and will facilitate the development of the consolidated cleanup plan.

3. Differences Between the Policy and Existing Practices.

The proposed Policy establishes mandatory requirements for the contents of cleanup plans and requires the use of specific ranking criteria and THS definition. The RWQCBs will have less discretion in defining and ranking toxic hot spots. The RWQCBs will also be required to include information in the cleanup plan that they might not have included otherwise (e.g., ranking based on weight-of-evidence or natural remediation potential).

4. Potential Adverse Environmental Effects.

The development of a Water Quality Control Policy will have no significant effect on the environment. The proposed Policy will ensure the consistent development of regional toxic hot spot cleanup plans. Standardizing the cleanup plans and establishing a consistent toxic hot spot definition and ranking criteria will increase the likelihood of the consolidated plan being completed by the June 30, 1999 deadline.

5. Potentially Significant Adverse Environmental Effects.

None.

Issue 2: **Toxic Hot Spot Definition**

1. Existing RWQCB Practices.

   The Water Code establishes a general definition. The statutory definition of a toxic hot spot gives the RWQCBs significant latitude in considering which locations in the State are considered toxic hot spots.

   It is very unclear how many toxic hot spots would be identified using the statutory definition. Conceivably, every water body that has been previously sampled could be designated as a toxic hot spot.

2. Proposed Policy.

   The proposed Policy would establish a specific definition of a toxic hot spot. The specific definition of a toxic hot spot combines consideration of the statutory definition of a toxic hot spot, sediment quality assessment criteria from the SWRCB 1991 workshop, several programmatic and regulatory criteria, SPARC review, and tools currently available to identify toxic hot spots.

   The specific definition is separated into two parts: candidate and known, based on whether the RWQCBs and SWRCB have adopted cleanup plans identifying the site as a known toxic hot spot. Under the proposed definition, a site shall be considered a candidate toxic hot spot if it exhibits significant toxicity, high levels of bioaccumulation, impairment of resident organisms, degradation of biological resources, or if water or sediment quality objectives are exceeded. Once the consolidated cleanup plan is adopted by the SWRCB then candidate sites will become known toxic hot spots.

   Sites that are not well characterized (i.e., insufficient data to designate as a candidate toxic hot spot) shall be characterized as areas of concern. Any site designated as an area of concern will be considered for further monitoring to confirm preliminary indications of the site impairments.

This alternative was selected because it provided the RWQCBs and the SWRCB a specific definition of a toxic hot spot that would allow the worst sites to be distinguished consistently from other sites.

3. Differences Between the Policy and Existing Practices.

Existing RWQCB practice is to broadly interpret the Water Code definition for use in planning for the cleanup or remediation of toxic hot spots. This approach is problematic because it would be difficult to focus efforts where regulatory response is needed most. Using the statutory definition would give the same "toxic hot spot" designation to sites with little information available as sites that are well studied. The RWQCBs would then be required to develop a cleanup plan that planned for the remediation or further prevention of toxic pollutants at these sites.

The statutory definition of a toxic hot spot is quite general, and could be subject to an interpretation that would allow large portions (if not all) of California's coastline, including enclosed bays and estuaries, to be designated as a toxic hot spot. Once they are identified the parties responsible for the sites could be liable for the cleanup of the site or further prevention of the discharges or activities that caused the toxic hot spot.

The proposed Policy establishes a specific definition that limits the discretion of the RWQCBs but allows them to include Region-specific factors (e.g., use of appropriate species for monitoring, interpretation of toxicity data). The specific definition also requires that a site should be considered a candidate toxic hot spot until the SWRCB has formally adopted the consolidated cleanup plan. After this plan is adopted the site will become a known toxic hot spot. This is necessary because the RWQCBs are required to initiate review of WDRs upon listing of toxic hot spots. Delaying the designation until the consolidated cleanup plan is completed allows the SWRCB to complete the CEQA analysis before any plan implementation.

4. Potential Adverse Environmental Effects.

The specific definition of a toxic hot spot in the proposed Policy is not expected to result in adverse impacts to the environment. The specific definition will allow for a more clear identification of toxic hot spots throughout the State. The definition will clearly identify the worst sites. This would allow the RWQCBs to better focus on these problem areas. Sites with little or contradictory information will not be identified as toxic hot spots. Sites that are of concern to the RWQCBs but do not meet the criteria of the definition are to be listed separately in the Regional cleanup plan. As these sites are better characterized they may become candidate toxic hot spots.

The RWQCBs recently completed proposed toxic hot spot cleanup plans using the specific definition presented in this FED. For all Regions, a total of 37 sites were identified as candidate toxic hot spots and 63 sites identified as areas of concern (RWQCB, 1997a; 1997b; 1997c; 1997d; 1997e; 1997f; 1997g).

5. Potentially Significant Adverse Environmental Effects.

None.

Issue 3: Criteria to Rank Toxic Hot Spots in Enclosed Bays and Estuaries of California

1. Existing RWQCB Practices.

The RWQCBs currently use the SWRCB's Watershed Management Initiative to establish priorities for funding and addressing problems.

The California Water Code, Section 13393.5, requires the State Water Board to develop and adopt criteria for the priority ranking of toxic hot spots in enclosed bays and estuaries. The criteria are to "take into account pertinent factors relating to public health and environmental quality, including but not limited to potential hazards to public health, toxic hazards to fish, shellfish, and wildlife, and the extent to which the

deferral of a remedial action will result or is likely to result in a significant increase in environmental damage, health risks or cleanup costs."

Each RWQCB is free to rank sites depending on their Regional priorities and needs.

2. Proposed Policy.

The ranking system presented in the proposed Policy has been designed to (1) provide a general criteria for ranking sites, (2) address specific requirements of the Water Code (Water Code Section 13393.5), and (3) establish a categorical ranking of toxic hot spots. The RWQCBs would be given discretion to rank sites based on the information available.

The ranking criteria provides the RWQCBs with five general criteria (plus a summary criterion) that can be used by each Region consistently but still allow for Region-specific interpretation and assessment of the final ranked order of sites.

This alternative was selected because it provides the best combination of Statewide consistency with RWQCB flexibility for ranking sites. The ranking criteria allow for Regional differences in the data used to rank sites, allows RWQCB discretion in establishing the final site ranks and is not so specific to require numerical ranking.

3. Differences Between the Policy and Existing Practices.

The major differences between existing practices and the proposed policy is that the ranking criteria address the mandated requirements of the Water Code, is more specific and applies to enclosed bays, estuaries and the ocean. The proposed Policy sets out a consistent method for ranking sites. Existing practices are region-specific.

4. Potential Adverse Environmental Effects.

The ranking criteria will have no significant impact on the environment. The role of the ranking criteria is to

provide a priority list of sites based on the severity of the identified problem. The Water Code calls for waste discharge requirements to be reevaluated in the ranked order. Water Code Section 13395 states, in part, that the RWQCBs shall "initiate a reevaluation of waste discharge requirements for dischargers who, based on the determination of the Regional Board, have discharged all or part of the pollutants which have caused the toxic hot spot. These reevaluations shall be for the purpose of ensuring compliance with water quality control plans and water quality control plan amendments. These reevaluations shall be initiated according to the priority ranking established pursuant to subdivision (a) of Section 13394 and shall be initiated within 120 days from, and the last shall be initiated within one year from, the ranking of toxic hot spots."

The priority ranking for each site is to be included in a Regional toxic hot spot cleanup plan which describes a number of factors including identification of likely sources of the pollutants that are causing the toxic characteristics and actions to be taken to remediate each site. The regional list of ranked hot spots will be consolidated into a statewide prioritized list of toxic hot spots, and included in the consolidated toxic hot spot cleanup plan.

Within specified periods of time, waste discharge requirements for each source identified as contributing to a toxic hot spot are to be reviewed and revised (with certain exceptions) to prevent further pollution of existing toxic hot spots or the formation of new hot spots. The reevaluation of permits is to be conducted in the order established by the priority ranking of hot spots.

The focus on point and nonpoint sources of pollution at highly ranked sites will most likely improve water and sediment quality.

Using the categorical ranking criteria, the RWQCBs identified 17 sites Statewide as "high" priority (RWQCB, 1997a; 1997b; 1997c; 1997d; 1997e; 1997f; 1997g).

5. Potentially Significant Adverse Environmental Effects.

None.

Issue 4: Mandatory Requirements for Regional and Statewide Toxic Hot Spot Cleanup Plans

1. Existing RWQCB Practices.

The SWRCB and RWQCBs are required by the Water Code (Section 13394) to address a variety of topics including the following information:

A. A priority ranking of all THS, including recommendations for remedial actions;

B. A description of each THS including a characterization of the pollutants present at the site;

C. An estimate of the total cost to implement the cleanup plan;

D. An assessment of the most likely sources of pollutants; (potential dischargers)

E. An estimate of recoverable costs from responsible parties;

F. Preliminary Assessment of Actions required to remedy or restore a THS;

G. A two-year expenditure schedule identifying state funds to implement the plans;

H. A summary of actions that have been initiated by the regional boards to reduce the accumulation of pollutants at existing THSs and to prevent the creation of new THSs

I. Findings and recommendations concerning the need for a toxic hot spot cleanup program.

No Specific guidance is given on what information should be included in each of these sections.

2. Proposed Policy.

The proposed Policy would establish specific requirements for what is required to adequately and consistently develop the Regional and Statewide Cleanup Plans. This additional guidance does not limit the RWQCBs to the quantity of information presented but rather should establish the basic amount of information necessary to complete the requirements of the Water Code. This alternative was selected because it will facilitate completion of the Statewide toxic hot spot cleanup plan. A section was also added that lists issues that will be considered in the Statewide consolidated plan.

3. Differences Between the Policy and Existing Practices.

Existing policy provides the SWRCB and the RWQCBs a great deal of flexibility is determining the contents of the cleanup plans. Beyond basic guidance of the topics to be covered there is no specific guidance on the contents of the plans. The proposed Policy differs for the existing practices by requiring the RWQCBs to provide a minimum amount of information in the regional toxic hot spot cleanup plans. The SWRCB will address issues raised by commenters on the draft FED (e.g., delisting sites, guidance on revision of WDRs, etc.).

4. Potential Adverse Environmental Effects.

The mandatory requirements for the contents of the toxic hot spot cleanup plans will have no significant effect on the environment. The proposed Policy will result in more consistently developed regional toxic hot spot cleanup plans. In most cases, the mandatory requirements will make the RWQCB cleanup plans more specific than would have otherwise been required. Therefore, the proposed Policy will better protect California enclosed bays and estuaries.

5. Potentially Significant Adverse Environmental Effects.

None.

Issue 5: Remediation Actions and Costs

1. Existing RWQCB Practices.

   The RWQCBs develop responses to cleanup actions on a case-by-case basis. Typically, the process the RWQCBs go through is (1) identify the potential problem, (2) identify any potentially responsible parties, and then (3) the existing enforcement authority to address the problem. RWQCBs cannot specify what means a discharger must use to solve the identified problem (Water Code Section 13360).

2. Proposed Policy.

   The proposed Policy presents guidance on a variety of remediation technologies and approaches that are available. The guidance requires the RWQCBs to consider a variety of remediation methods and requires the RWQCBs to estimate the costs of the cleanup, if possible. When cost estimates are not available to address a toxic hot spot the RWQCBs will develop a watershed management effort that brings together dischargers so that realistic, problem-specific cost estimates can be made. This alternative was chosen because it provides the RWQCBs with consistent guidance on estimating the actions necessary to address a sediment pollution problem and the costs associated with the alternatives and because it provides a mechanism to address the problem when cost estimates cannot be made. The proposed Policy does not require that the estimates be used when the discharger voluntarily or through an enforcement action addresses the toxic hot spot.

3. Differences Between the Policy and Existing Practices.

   Existing practices are to allow each RWQCB to develop cleanup actions based on the experience of individual staff and the identified dischargers. The proposed Policy requires the RWQCBs to consider a

variety of alternatives and to plan actions necessary to address polluted sites before any enforcement or other actions are implemented. This alternative was selected because it will require the RWQCBs to complete preliminary plans for addressing toxic hot spots before enforcement or other actions are begun.

4. Potential Adverse Environmental Effects.

The remediation and costs guidance will have no significant effect on the environment. The proposed Policy will result in more consistently developed regional toxic hot spot cleanup plans and will result in the RWQCBs completing preliminary planning for addressing the identified toxic hot spot. The proposed Policy will better protect bays, estuaries and the ocean because the RWQCBs will complete much of the planning necessary to address the toxic hot spot. In addition, since these approaches do not limit the RWQCBs once the cleanup plans are implemented (using existing authorities), the effect on dischargers for specifying the methods should be minimal.

5. Potentially Significant Adverse Environmental Effects.

None.

Issue 6: Toxic Hot Spot Prevention Strategies and Costs

1. Existing RWQCB Practices.

The RWQCBs develop responses to address toxic hot spots that can include modifying and issuing WDRs or implementing the NPS Management Plan. In fact, the Water Code requires that the RWQCBs initiate an evaluation of WDRs that may influence a listed toxic hot spot. Typically, the process the RWQCBs go through is (1) identify the potential problem, (2) identify any potentially responsible parties, and then (3) the existing enforcement authority to address the problem. There are a variety of programs that can be used to address toxic hot spots identified in the cleanup plans (Please refer to Issue 6 in the Issue Analysis section above). Depending on the experience of RWQCB staff reviewing the WDRs, some or all of

these programs will be considered in revising WDRs to prevent or cleanup a toxic hot spot.

2. Proposed Policy.

The proposed Policy presents guidance on a variety of prevention programs available to the RWQCBs. The proposed Policy requires the RWQCBs to integrate efforts to address polluted sites by addressing pollution prevention of point and nonpoint sources in a watershed management approach. The guidance restates the NPS Plan requirements for addressing NPS problems and encourages the RWQCBs to involve all interested parties in the development of prevention strategies. The proposed Policy specifies that the RWQCBs work within existing watershed management efforts to protect water quality. The proposed Policy recommends several types of analyses that should be considered as part of these efforts.

3. Differences Between the Policy and Existing Practices.

The proposed Policy does not represent a substantive change from existing practices but is designed to provide greater Statewide consistency.

4. Potential Adverse Environmental Effects.

The proposed Policy, as well as the various existing RWQCB practices, protects water quality by providing additional guidance to the RWQCBs on using a watershed management approach when evaluating point and nonpoint sources of pollution. The proposed Policy does not represent a significant change from existing practices, and, therefore, would not have significant effects on water quality, human health, or aquatic life, or place significant additional requirements on dischargers.

5. Potentially Significant Adverse Environmental Effects.

None.

Growth-Inducing Impacts

CEQA defines the expected discussion of growth-inducing impacts and indirect impacts associated with growth in Section 15126(g) of the CEQA guidelines. That section states:

> "...Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increase in the population may further tax existing community service facilities so consideration must be given to this impact. Also discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."

The proposed Policy provides consistent Statewide guidance on the development of Regional cleanup plans and the consolidated toxic hot spot cleanup plans as required by the Water Code (Section 13390 et seq.). The analysis of environmental impacts concludes that each part of the proposed Policy will not have a significant effect on the environment. The proposed Policy is not expected to foster or inhibit economic or human population growth, or the construction of additional housing.

Cumulative and Long-Term Impacts

CEQA guidelines Section 15355 provides the following description of cumulative impacts:

> "'Cumulative impacts' refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.

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

One means of complying with CEQA's requirement to consider cumulative impacts is to provide a list of past, present and reasonably foreseeable future projects which are related to the proposed action. There is one project which meets this definition: the development of the consolidated Statewide toxic hot spot cleanup plan.

The development of the consolidated toxic hot spot cleanup plan will involve compiling the Regional toxic hot spot cleanup plans and incorporating them into the consolidated cleanup plan. When the SWRCB considers the consolidated plan, it will consider any unaddressed potential effects of the actions identified in the Regional toxic hot spot cleanup plans. However, we do not know now what actions will be necessary because the Regional cleanup plans have yet to be completed in final form or adopted. Once the Regional toxic hot spot cleanup plans are adopted and incorporated into a proposed consolidated plan, the SWRCB will conduct a CEQA review and consider unaddressed potential environmental impacts (both direct and indirect) of adoption of the proposed consolidated plan.

When the program FED is prepared for the Statewide toxic hot spot cleanup plan, the SWRCB will provide the opportunity for public review. The analysis that will take place in the program FED for the Statewide toxic hot spot cleanup plan will focus on specific issues identified at specific toxic hot spots (i.e., the analysis will most likely be tiered as described in CEQA Guidelines Section 15385).

ENVIRONMENTAL CHECKLIST

A. Background

1. Name of Proponent: State Water Resources Control Board

2. Address and Phone Number of Proponent: Division of Water Quality
P.O. Box 944213, Sacramento, CA 94244-2130 (916) 657-0671

3. Date Checklist Submitted: March 5, 1998

4. Agency Requiring Checklist: Resources Agency

5. Name of Proposal, if Applicable: Water Quality Control Policy For Guidance on the Development of Regional Toxic Hot Spot Cleanup Plans

B. Environmental Impacts
(Explanations are included on attached sheets).

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
I.	LAND USE AND PLANNING.				
	Would the proposal:				
a.	Conflict with general plan designation or zoning?	[ ]	[ ]	[ ]	[X]
b.	Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project?	[ ]	[ ]	[ ]	[X]
c.	Be incompatible with existing land use in the vicinity?	[ ]	[ ]	[ ]	[X]
d.	Affect agriculture resources or operations (e.g. impacts to soils or farmlands or impacts from incompatible land uses)?	[ ]	[ ]	[ ]	[X]
e.	Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)?	[ ]	[ ]	[ ]	[X]
II.	POPULATION AND HOUSING.				
	Would the proposal:				
a.	Cumulatively exceed official regional or local population projections?	[ ]	[ ]	[ ]	[X]
b.	Induce substantial growth in an area either directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	[ ]	[ ]	[ ]	[X]
c.	Displace existing housing especially affordable housing?	[ ]	[ ]	[ ]	[X]

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
III.	GEOLOGIC PROBLEMS				
	Would the proposal result in or expose people to potential impacts involving:	[ ]	[ ]	[ ]	[X]
a.	Fault rupture?				
b.	Seismic ground shaking?	[ ]	[ ]	[ ]	[X]
c.	Seismic ground failure, including liquefaction?	[ ]	[ ]	[ ]	[X]
d.	Seiche, tsunami, or volcanic hazard?	[ ]	[ ]	[ ]	[X]
e.	Landslides or mudflows?	[ ]	[ ]	[ ]	[X]
f.	Erosion, changes in topography or unstable soil conditions from excavation, grading or fill?	[ ]	[ ]	[ ]	[X]
g.	Subsidence of the land?	[ ]	[ ]	[ ]	[X]
h.	Expansive soils?	[ ]	[ ]	[ ]	[X]
i.	Unique geologic or physical features?	[ ]	[ ]	[ ]	[X]
IV.	WATER				
	Would the proposal result in:				
a.	Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	[ ]	[ ]	[ ]	[X]
b.	Exposure of people or property to water related hazards such as flooding?	[ ]	[ ]	[ ]	[X]
c.	Discharge into surface water or other alteration of surface water quality (e.g. temperature, dissolved oxygen or turbidity)?	[ ]	[ ]	[ ]	[X]
d.	Changes in the amount of surface water in any water body?	[ ]	[ ]	[ ]	[X]
e.	Changes in currents or the course or direction of surface water movements?	[ ]	[ ]	[ ]	[X]
f.	Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of ground water recharge capability?	[ ]	[ ]	[ ]	[X]
g.	Altered direction or rate of flow of ground water?	[ ]	[ ]	[ ]	[X]
h.	Impacts to ground water quality?	[ ]	[ ]	[ ]	[X]
i.	Substantial reduction in the amount of ground water otherwise available for public water supplies?	[ ]	[ ]	[ ]	[X]

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
V.	AIR QUALITY				
	Would the proposal:				
a.	Violate any air quality standard or contribute to an existing or projected air quality violation?	[ ]	[ ]	[ ]	[X]
b.	Expose sensitive receptors to pollutants?	[ ]	[ ]	[ ]	[X]
c.	Alter air movement, moisture, or temperature, or cause any change in climate?	[ ]	[ ]	[ ]	[X]
d.	Create objectionable odors?	[ ]	[ ]	[ ]	[X]
VI.	TRANSPORTATION/CIRCULATION				
	Would the proposal result in:				
a.	Increased vehicle trips or traffic congestion?	[ ]	[ ]	[ ]	[X]
b.	Hazards to safety from design features (e.g. farm equipment)?	[ ]	[ ]	[ ]	[X]
c.	Inadequate emergency access or access to nearby uses?	[ ]	[ ]	[ ]	[X]
d.	Insufficient parking capacity on- site or off-site?	[ ]	[ ]	[ ]	[X]
e.	Hazards or barriers for pedestrians or bicyclists?	[ ]	[ ]	[ ]	[X]
f.	Rail, waterborne or air traffic impacts?	[ ]	[ ]	[ ]	[X]
g.	Conflicts with adopted policies supporting transportation (e.g., bus turnouts, bicyclists racks)?	[ ]	[ ]	[ ]	[X]
VII.	BIOLOGICAL RESOURCES				
	Would the proposal result in impacts to:				
a.	Endangered, threatened or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds)?	[ ]	[ ]	[ ]	[X]
b.	Locally designated species?	[ ]	[ ]	[ ]	[X]
c.	Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)?	[ ]	[ ]	[ ]	[X]
d.	Wetland habitat (e.g. marsh, riparian and vernal pool)?	[ ]	[ ]	[ ]	[X]
e.	Wildlife dispersal or migration corridors?	[ ]	[ ]	[ ]	[X]
VIII.	ENERGY AND MINERAL RESOURCES				
	Would the proposal:				
a.	Conflict with adopted energy conservation plans?	[ ]	[ ]	[ ]	[X]

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
b.	Use non- renewable resources in a wasteful and inefficient manner?	[ ]	[ ]	[ ]	[X]
c.	Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	[ ]	[ ]	[ ]	[X]
IX.	HAZARDS				
Would the proposal involve:					
a.	A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation)?	[ ]	[ ]	[ ]	[X]
b.	Possible interference with an emergency response plan or emergency evacuation plan?	[ ]	[ ]	[ ]	[X]
c.	The creation of any health hazard or potential health hazard?	[ ]	[ ]	[ ]	[X]
d.	Exposure of people to existing sources of potential health hazards?	[ ]	[ ]	[ ]	[X]
e.	Increased fire hazard in areas with flammable brush, grass, or trees?	[ ]	[ ]	[ ]	[X]
X.	NOISE				
Would the proposal result in:					
a.	Increases in existing noise levels?	[ ]	[ ]	[ ]	[X]
b.	Exposure of people to severe noise levels?	[ ]	[ ]	[ ]	[X]
XI.	PUBLIC SERVICES				
Would the proposal have an effect upon or result in a need for new or altered government services in any of the following areas:					
a.	Fire protection?	[ ]	[ ]	[ ]	[X]
b.	Police protection?	[ ]	[ ]	[ ]	[X]
c.	Schools?	[ ]	[ ]	[ ]	[X]
d.	Maintenance of public facilities, including roads?	[ ]	[ ]	[ ]	[X]
e.	Other governmental services?	[ ]	[ ]	[ ]	[X]
XII.	UTILITIES AND SERVICE SYSTEMS				
Would the proposal result in a need for new systems or supplies or substantial alterations to the following utilities:					
a.	Power or natural gas?	[ ]	[ ]	[ ]	[X]
b.	Communications systems?	[ ]	[ ]	[ ]	[X]

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
c.	Local or regional water treatment or distribution facilities?	[ ]	[ ]	[ ]	[X]
d.	Sewer or septic tanks?	[ ]	[ ]	[ ]	[X]
e.	Storm water drainage?	[ ]	[ ]	[ ]	[X]
f.	Solid waste disposal?	[ ]	[ ]	[ ]	[X]
g.	Local or regional water supplies?	[ ]	[ ]	[ ]	[X]
XIII.	AESTHETICS				
	Would the proposal:				
a.	Affect a scenic vista or scenic highway?	[ ]	[ ]	[ ]	[X]
b.	Have a demonstrable negative aesthetic effect?	[ ]	[ ]	[ ]	[X]
c.	Create light or glare?	[ ]	[ ]	[ ]	[X]
XIV.	CULTURAL RESOURCES				
	Would the proposal:				
a.	Disturb paleontological resources?	[ ]	[ ]	[ ]	[X]
b.	Disturb archaeological resources?	[ ]	[ ]	[ ]	[X]
c.	Affect historical resources?	[ ]	[ ]	[ ]	[X]
d.	Have the potential to cause a physical change which would affect unique ethnic cultural values?	[ ]	[ ]	[ ]	[X]
e.	Restrict existing religious or sacred uses within the potential impact area?	[ ]	[ ]	[ ]	[X]
XV.	RECREATION				
	Would the proposal:				
a.	Increase the demand for neighborhood or regional parks or other recreational facilities?	[ ]	[ ]	[ ]	[X]
b.	Affect existing recreational opportunities?	[ ]	[ ]	[ ]	[X]
XVI.	MANDATORY FINDINGS OF SIGNIFICANCE				
a.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self- sustaining levels, threaten to eliminate a plant or animal community, Reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	[ ]	[ ]	[ ]	[X]

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
b.	Does the project have the potential to achieve short- term, to the disadvantage or long- term, environmental goals?	[ ]	[ ]	[ ]	[X]
c.	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).	[ ]	[ ]	[ ]	[X]
d.	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	[ ]	[ ]	[ ]	[X]

C. DETERMINATION

Based on the evaluation in FED (Environmental Effects Section), I find that the proposed Policy which provides guidance for the development of toxic hot spot cleanup plans will not have a significant adverse effect on the environment.

March 2, 1998
Date

Jesse M. Diaz, Chief
Division of Water Quality
State Water Resources Control Board

ENVIRONMENTAL CHECKLIST -- Phase 1 (Policy)

I.a.,b.,c.,e. Land use and planning (e.g., general plans and zoning) delineate those areas that will be developed, and the type and density of development to be allowed. There is nothing in the proposed Policy that requires property to be used in any way or prohibits property uses.

I.d. The regulation of nonpoint source toxic substances to address identified toxic hot spots that may be caused by pesticides could impact farming operations. However, the SWRCB is not changing its approach to nonpoint source regulation, outlined in its Nonpoint Source Management Plan (NPS Plan). The SWRCB and RWQCBs will continue to work with nonpoint source dischargers under the existing NPS Plan.

II.a.,b.,c.;XV.a. See the Growth-Inducing Impacts Section of the FED.

III.a.,b.,d. These geologic actions are not caused by water pollution. However, people could potentially be exposed to such impacts during the construction or operation of new facilities to treat water pollution to address identified toxic hot spots. If such actions are necessary to address toxic hot spots, the potential environmental effects will be addressed in the program FED on the consolidated toxic hot spot cleanup plan.

III.c. Liquefaction occurs in the subsurface when the mechanical behavior of a granular material is transformed from a solid state to a liquid state due to loss of grain-to-grain contact during earthquake shaking. It occurs most often in areas underlain by saturated, unconsolidated sediments. Seismic ground failure is not caused or affected by water pollution.

III.a.,b.,d.,e.,f.,g.,i.;V.d.;VI.a.,b.,c.,d.,e.,f.,g.;VIII.a.,b.,IX.a.,b.,e.;X.a.,b.;XI.a.,b.,c.,d.,e.;XII.a.,b.,f.; XIII.a.,b.,c.;XIV.a.,b.,c.,d.,e. Exposure of people to geologic actions, landslides, erosion, impacts to transportation systems, energy impacts, odors, impacts to public services and utilities, impacts to wildlife areas, and impacts to aesthetics or cultural resources could occur during the construction or operation of new facilities to treat water pollution. If such actions are necessary to address toxic hot spots, the potential environmental effects will be addressed in the program FED on the consolidated toxic hot spot cleanup plan.

III.h. Expansion of soils is influenced by amount of moisture change and the type of soil (the amount of clay in the soil, and the type of minerals in the clay). Shrink-swell is measured by the volume change in the soil. Water pollutants do not significantly affect the shrink-swell capacity of soils.

IV.a.,b.,d.,e.,f.,g.,i. Levels of toxic substances do not affect absorption rates, drainage patterns, surface runoff, flooding, quantity of surface or ground water, surface water currents, or ground water flow or supply.

IV.c. The proposed Policy is expected to provide procedures that would enable the RWQCBs to better regulate water and sediment quality and to generally improve water and sediment quality.

IV.h.;V.a.,b. The proposed Policy is not expected to adversely affect ground water or air quality.

V.c. There is no evidence that toxic water or sediment pollutants significantly affect temperature, humidity, precipitation, winds, cloudiness, or other atmospheric conditions.

VII.a.,b.,c.,d.,e.;XVI.a. The proposed Policy is not expected to cause any significant adverse effects to plants and animals, including rare, threatened, or endangered species. The provisions of the proposed Policy are expected to encourage better regulation of polluted sediments and water. Therefore, the proposed Policy will encourage development of and protect rare and endangered species as well as fish and

wildlife habitats generally. If there are potential impacts to these resources identified in the development of the Regional toxic hot spot cleanup plans then the potential environmental effects will be addressed in the program FED on the consolidated toxic hot spot cleanup plan.

VIII.c. The proposed Policy does not involve or affect the mining of mineral resources.

IX.c.,d.;XVI.d. The proposed Policy is not expected to cause adverse effects to human health.

XII.c.,d.,e.,g. Effects on wastewater or water utility and service systems could potentially occur if the proposed Policy would cause dischargers to have to take compliance actions that involved construction or substantial alterations to treatment facilities. However, the Policy is not expected to require dischargers to take such compliance actions. If there are potential impacts to these resources identified in the development of the Regional toxic hot spot cleanup plans then the potential environmental effects will be addressed in the program FED on the consolidated toxic hot spot cleanup plan.

XV.b. Toxic pollutants in water and sediment can affect recreational opportunities such as swimming if water quality criteria/objectives are not achieved in a water body.

XVI.a.,c. See the section of the FED regarding cumulative and long-term impacts.

COMMENTS AND RESPONSES

On March 5, 1998, a public notice for the two public hearings was circulated to the public and a draft FED (DWQ/SWRCB, 1998) was made available for public review. The hearing notice was also published in several newspapers with circulation in coastal areas. The list of persons who submitted written comments or oral testimony are listed below. A key for reading the comment and response table follows the list of commenters. Finally, a table is presented with a summary of all comments submitted and the SWRCB response to each comment.

List of Commenters

Individuals or organizations who submitted written comments on the proposed Water Quality Control Policy before the close of the hearing record (May 15, 1998) or who gave testimony at the May 5 or May 11, 1998 hearings are listed below. Each of the commenters are referred to by number when referenced in the various issues. All comments presented at the hearing were addressed.

1. Edward R. Long
   U.S. Department of Commerce
   National Oceanic and
   Atmospheric Administration
   National Ocean Service
   ORCA/Coastal Monitoring &
   Bioeffects Assessment Division
   7600 Sand Point Way NE
   Seattle, WA 98115

2. Scott Folwarkow
   c/o BPTCP Advisory Committee
   P.O. Box 944213
   Sacramento, CA 94244-2130

3. Geraldine Knatz, Ph.D.
   The Port of Long Beach
   P.O. Box 570
   Long Beach, CA 90801-0570

4. Leona O. Coles
   14041 San Pablo Ave.
   San Pablo, CA 94306

5. Jaque Forrest
   Heal the Bay
   2701 Ocean Park Blvd., Suite 150
   Santa Monica, CA 90405

6. Nicole Capretz
Campaign Associate
Clean Bay Campaign
Environmental Health Coalition
1717 Kettner Blvd., Suite 100
San Diego, CA 92101

7. David R. Williams
East Bay Municipal Utility District
P.O. Box 24055
Oakland, CA 94623-1055

8. Scott Ogle, Ph.D.
Pacific Eco-Risk Laboratories
827 Arnold Dr., Suite 100
Martinez, CA 94553

9. Morris L. Allen
Director of Municipal Utilities
Department of Municipal Utilities
2500 Navy Drive
Stockton, Ca 95206-1191

10. Keith Nakatani
Program Director
Save San Francisco Bay
Association
1736 Franklin Street, Fourth Floor
Oakland, CA 94612

11. Donald W. Rice
Director of Environmental
Management
The Port of Los Angeles
P.O. Box 151
San Pedro, CA 90733-015

12. Steve Ritchie
System Planning and
Regulatory Compliance
Public Utilities Commission
City and County of San Francisco
1212 Market St., Suite 310
San Francisco, CA 94102

13. G. Fred Lee, Ph.D, DEE
G. Fred Lee and Associates
27298 E. El Macero Dr.
El Macero, CA 95618-1005

14. Agricultural Council of California
California Association of
Nurserymen
California Farm Bureau Federation
California Forestry Association
California Forest Resource Council
California Grape and Treefruit
League
California League of Food
Processors
Western Growers Association

15. Erick L. Armstrong
Dept. of the Navy
Commander Naval Base
937 No. Harbor Drive
San Diego, CA 92132-6100

16. Dave Brent
California Stormwater
Quality Task Force
5770 Freeport Blvd., Suite 100
Sacramento, CA 95822

17. California Manufacturers
Association
California Chamber of Commerce
Western States Petroleum
Association
Industrial Environmental
Association
American Forest and Paper
Association
Forest Resources Council
Western Crop Protection
Association
Surface Technology Association
Printed Circuit Alliance
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Presenters at the May 5, 1998 Public Hearing

46. Steve Fleischli
    Heal the Bay

47. Bob Kanter
    The Port of Long Beach

48. Pete Michael
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49. Ruth Kolb
    Port of San Diego

50. Nicole Capretz
    Environmental Health Coalition

Presenters at the May 11, 1998 Public Hearing

51. Ellen Johnck
    Bay Planning Coalition

52. Darlene Ruiz
    Hunter/Ruiz

53. M'K Veloz
    Northern California Marine
    Association

54. Marshall Lee
    California Department of Pesticide
    Regulation

55. Brian Stuart
    Dow AgroSciences

56. Eric Newman
    Western States Petroleum
    Association

57. Keith Nakatani
    Save San Francisco Bay
    Association

58. Melissa Thorme
    Tri-TAC

59. Sharon Green
    County Sanitation Districts of
    Los Angeles County

60. Patti Tenbrook
    East Bay Municipal Utility
    District

61. Alvin Greenberg
    Planning and Conservation League

62. G. Fred Lee
    G. Fred Lee and Associates

Dr. James Hunt (Commenter 21) and Dr. Alex Horne (Commenter 45) peer reviewed the draft FED pursuant to Section 57004 of the Health and Safety Code.

Key for Reading the Comments and Responses Table

Column 1	**Comment Number:** Each comment has been assigned a comment number consisting of two parts which are separated by a period. Starting from the left, the comment number begins with a number representing the interested party that submitted the comment. The list of commenters, with their assigned codes, is provided in the previous sub-section. Following the comment number is a number that represents the individual comment presented in the submittal or testimony. During the development of the response to comments it became necessary to further split comments so they could be responded to better. In these cases individual comments that were split received a letter of the alphabet in addition to the numeric code (e.g., 35.1a (Commenter 35, Comment 1, part a)).
Column 2	**Summary of Comment:** The column provides a summary of each individual comment the SWRCB received on the March 1998 draft Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup Plans.
Column 3	**Response:** The column contains the SWRCB response to each comment.
Column 4	**Revision:** This column states whether the proposed Policy was revised based on the comment.
Column 5	**Section/Area:** This column provides the section of the draft FED (DWQ/SWRCB, 1998) that the commenter was addressing. If the comment was not focused on any specific section or area, no section is listed.

Summary of Comments and Responses

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
1.1	FED correctly describes and applies the sediment quality guidelines produced by E. Long and D. MacDonald	Comment acknowledged.	No	FED Issue 2. THS definition, alternative 2
2.1	BPTCP Advisory Committee list of issues discussed on March 31, 1998. Many issues were brought up in the meeting without reaching consensus. Comments enclosed in letter.	Comments acknowledged.	No	FED, various issues
3.1	It is erroneous to label a site or water body a candidate THS automatically when fish tissue levels are found to exceed FDA or NAS levels, or a health advisory against the consumption of edible non-migratory fish has been issued by OEHHA or DHS.	The statutory definition of a THS (Water Code Section 13395.5(e) includes locations where, ...hazardous substances have accumulated in water or sediment to levels which (1) may pose a substantial present or potential hazard to aquatic life, wildlife fisheries or human health.... in developing the specific definition of a THS we were required to include a condition that would address the intent of the law. The focus of the criterion to address human health concerns centers around the issuance of consumption advisories. Clearly the beneficial use is lost if an advisory is issued. No viable alternative has been proposed to address human health other than not using the advisories. The SWRCB cannot use the measures of the sediment quality triad because these measures do not address human health concerns. The SWRCB would be remiss if they did not address human health in the BPTCP. Please refer to the response for Comment 13.29 related to our use of the FDA and NAS levels.	No	Policy, pages xviii-xx
3.2	The prioritization of a site for cleanup based on the identification of "pollutant source" is not appropriate for determining cleanup rank.	Accept. Pollutant source information is valuable information to assess which sources are understood and is best used in the planning section of the	Yes	Policy, page xxii

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		cleanup plans (as described in Water Code Section 13394). The pollutant source criterion has been deleted from the proposed Policy and Ranking Criteria, Alternative 4 in the FED.		
3.3	Many of the National Academy of Science (NAS) cleanup strategies have not been demonstrated to be viable in the real world and none of the strategies consider the economics of application.	The remediation actions listed in the FED and Policy are meant to give the RWQCBs considerable latitude in determining which action would be most appropriate for a specific site. The lists of alternatives presented by the NRC are inclusive and set up as examples of methods that could conceivably be used. The list may include methods that are currently experimental or have not been used extensively, but it gives the RWQCBs a wide range of cleanup options that should be considered when the RWQCBs are faced with planning for the site cleanup.	No	Draft Policy Sediment Cleanup Methods page xxiv
3.4	Table 13 is likely to provide inaccurate guidance on remedial options since there are a number of variables which influence cleanup cost	Clean up costs presented are estimates that will be significantly influenced by site-specific considerations. The table on page 83 recognizes the cost will depend on many factors. The estimates of costs of the various remedial technologies will be used by the RWQCBs as a starting point, to obtain new project-specific estimates of cleanup costs when the cleanup plans are implemented.	No	Draft Policy. Table 13 Sediment Cleanup Costs page xli
3.5	Since government funding is limited it is important to minimize or eliminate redundant efforts and expense. The prevention of THS section lacks any definitive statements of what programs exist and how they will be coordinated with the BPTCP.	Part of the intent of developing regional cleanup plans is to provide a proactive planning tool for the RWQCBs to use in addressing sites in waters of the State where the beneficial uses are impacted or threatened. There are many existing State and Federal programs that are presently capable of addressing the prevention of THS. Some of these programs may have the resources and mandates to implement prevention. It may be that some THS can only be addressed through a multi-disciplinary, integrated effort and the RWQCBs will only be part of that coordinated effort to achieve improvement in	No	Draft policy. Prevention of THS page xliii

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		water and sediment quality. The FED identified a number of existing programs that may or may not be usable when the time comes to implement prevention efforts. In the final analysis, it will be up to the RWQCBs to determine how to best achieve effective remediation of toxic hot spots, be it as part of a multi-disciplinary approach (watershed management) or as the lead agency in implementing the mandates of the Porter-Cologne Water Quality Control Act. The prevention section of the FED provides general guidance with great flexibility afforded to the RWQCBs for addressing their region-specific needs.		
3.6	The draft policy does not provide a mechanism for de-listing THS that have been either remediated or addressed under another State or Federal program.	Partially accept. It is not necessary for the regional plans to have a mechanism for delisting sites because these plans are not considered final or implementable until they have been approved and included in the consolidated toxic hot spot cleanup plan. The SWRCB's consolidated plan needs a mechanism for delisting sites. A new section has been added to the Policy addressing issues that will be addressed by the SWRCB in adopting the Statewide Cleanup Plan. One of the issues that must be addressed in this new section is the mechanism to be used by the State and Regional Board for delisting a THS.	Yes	
4.1	Looking forward to the development of responsible Cleanup Plans and giving immediate attention to the cleanup and future avoidance of toxic materials pollution in California	Comment acknowledged.	No	
4.2	Please adopt, commit, start to do and continue the cleanup.	Comment acknowledged.	No	
5.1	There may be more THS in a region than currently identified because each region uses a different standard to determine THS. The proposed Policy should include language implementing consistent and equitable standards to determine THS in all regions.	The specific definition of a THS addresses the mandates of the Water Code (Section 13391.5(e)) and gives guidance on the various conditions that need to be met to designate a candidate THS. The specific definition both addresses water and sediment problems as well as aquatic life and human health	No	Policy, definition

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		protection. This definition strikes a balance between consistency in approach for identifying toxic hot spots and the need for flexibility to allow for Regional differences in environmental conditions and policy. The approach taken allows the RWQCBs to determine the conditions met in each site to designate it as a candidate THS. The determination will not only be influenced by the RWQCBs assessment of the impacts on the beneficial uses but also by the social, political, and economic factors associated with the designation of sites within the Region.		
5.2	The proposed Policy should include a complete description of the sediment quality triad.	The specific definition contains all the measures of the sediment quality triad. The description of the definition is oriented toward the Water Code definition of toxic hot spots (Section 13391.5(e)) and as such presents approaches for assessing aquatic life impacts and human heath impacts. The sediment quality triad approach only addresses measurements of aquatic life impacts and a complete description may turn attention away from the Water Code mandates. The measures considered in the sediment quality triad approach are sediment chemistry, toxicity and benthic community analysis. The THS definition encompasses other factors including effects on human health, effects of tissue residues in aquatic organisms, and exceedances of water quality objectives or criteria. These effects are not measured with the sediment quality triad approach.	No	Policy, definition
5.3	Each region should be required to describe the monitoring approach including how the sediment quality triad was applied to the candidate sites and a catalogue of any historical data that was used to develop the monitoring approach.	The contents of the Regional Toxic Hot Spot Cleanup Plans (page, xiv. Item No. 4) requires the RWQCBs to include a section on the monitoring approach used in each Regional Cleanup Plan. In the case were a RWQCB has used a region specific approach the modifications shall be described.	No	Policy, page xiv

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
5.4	A more specific criterion be included in the Policy in defining "Insufficient information" when listing "Areas of Concern."	The Specific definition specifies the factors that must be met by a site in order to quality as a candidate THS. Those sites that meet one of the conditions necessary should be identified as a candidate THS. Those sites that do not meet the definition, or where there is not enough information to make the designation the RWQCB may opt to list the site as an "Area of Concern".	No	Priority ranking page xiv
5.5	It is recommended that the Regional THS Cleanup Plans include a rationale for determining the areal extent of a THS.	The information to determine areal extent will generally not be available when the cleanup plans are developed. But that does not mean the plan development should be delayed. One of the first steps in implementing the plans has to be better characterization of the sites. The proposed Policy states this. The proposed Policy requires that the RWQCB in characterizing THS estimate the boundary, size and/or volume of the site. In doing so, the RWQCB should consider the historical aspects of the site, the current status and the mix of chemicals present. The RWQCBs will determine the amount of pertinent information needed to characterize a THS in the Regional Cleanup Plan.	No	Policy, page Xvi
5.6	The assessment of areal extent described on Page xvi is inconsistent with the assessment of areal extent in the ranking criteria on page xxii. Areal extent assessment by volume is not addressed in the ranking criteria section of the proposed Policy.	The ranking criterion for areal extent is an estimate of the size of the toxic hot spot. RWQCBs have experience estimating the size of impaired locations in water bodies from the Water Quality Assessment process. Area and volume are critical in the development of the planning portion of the document (Page xvi) but would not assist in the ranking process. Modifying the ranking criterion to include volume considerations to be consistent with the item no. 6A of the contents of the Regional Cleanup Plans section of the proposed Policy would not add any additional information to the ranking process.	No	Policy, page xxii

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
5.7	For the assessment of pollutant sources, the Regional THS Cleanup Plans should include a description of the process used to determine that the pollutant source cannot be identified.	Please refer to response for Comment 3.2.	Yes	
5.8	It is recommended that the introductory paragraph of the Specific definition of a THS be re-written to reflect that the mechanisms described to identify and distinguish between candidate and known THS are criteria and not a mechanism.	The word "mechanism" can be defined as the means by which an effect is produced or a purpose is accomplished. The specific definition helps establish the means to distinguish between a candidate THS and a known THS. The word "criteria" on the other hand, caries regulatory meanings that do not apply to this definition. "Mechanism" conveys the meaning that was intended and is the appropriate word to use in this context.	No	Policy, page xviii
5.9	The Policy should specify the sediment quality objectives to be used to determine THS candidacy. Are the sediment objectives ERLs and ERMs?	Currently there are no sediment quality objectives in place specifically for enclosed bays and estuaries (beyond the narrative objectives for protection of estuarine beneficial uses and, for ocean waters, water quality objectives that apply to sediments in the Ocean Plan). ERLs and ERMs are not sediment quality objectives. They are sediment quality guidelines used as tools to evaluate the quality of marine and estuarine sediments for chemicals of concern. The specific definition of THS requires a focus on the effects of toxic pollutants. For a site to be designated as a THS, an association must be made between the observed biological effects and sediment chemistry. Because of the varied environmental and pollution-related conditions throughout the State, the Specific Definition recommends four approaches as a way to compile the information needed (weight-of-evidence) to indicate the effects produced by specific pollutants. The use of sediment quality guidelines (such as ERMs and PELs) is used only to support the observed impacts on beneficial uses and to determine	No	Policy, page xviii

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		if chemical measures can contribute to the observed effects.		
5.10	Toxicity determinations using recurrent measurements is (1) very costly ; (2) if multiple sites exhibit toxicity why is this necessary; and (3) second measurements must use some sampling locations and methods, and analytical methods as the first sample.	Repeated toxicity measurements are costly but necessary to establish that beneficial uses are impacted. Even though repeated toxicity is not needed to say a site is toxic (SPARC, 1997), the SWRCB is using this requirement to make sure that RWQCBs identify the worst of the worst sites. Indicator tests should be used independently and, therefore, the definition does not prevent RWQCBs from using separate tests to assess repeated toxicity. The BPTCP sampling design is based on a directed point sampling approach in order to identify specific THS. Directed point sampling, as implemented, requires a two step process where areas of interest are selected for sampling. At this initial stage (the screening phase) a broad assessment of toxicity is carried out throughout the study area. Stations exhibiting toxicity during the screening phase are then selected for a second round of sampling (confirmation phase). In this confirmation phase sampling is replicated and chemical analysis of samples is more extensive. In addition benthic community analysis is performed. Evidence from this two step process is used to identify THS with a higher level of certainty.	No	Policy, page xviii-xix
5.11	The application of the ranking criteria is based on the judgment of the regional board staff. The policy should include very specific guidelines for using the ranking criteria in order to promote consistency and ensure some degree of thoroughness in reviewing the information available for a given site.	The ranking criteria addresses the mandates of the Water Code (Section 13393.5) and gives general guidance on the various conditions that need to be met to rank candidate toxic hot spots. The ranking criteria addresses aquatic life and human health protection, whether water quality objectives are exceeded, remediation potential and areal extent. These criteria strike a balance between consistency in approach for ranking THS and the need for flexibility	No	Policy, page xxi-xxii

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		to allow for Regional differences in environmental conditions and policy. The approach taken allows the RWQCB to determine the conditions met in each site to rank its importance. The determination will not only be influenced by the RWQCBs assessment of the impacts on the beneficial uses but also by the social, political, and economic factors associated with the designation of sites within the Region.		
5.12	The proposed policy should reiterate the information presented in page xix No.3 (Human Health Impacts) in the ranking criteria as well as other non-federal and state published fish tissue contamination studies for the affected area.	The relevant information is presented in the specific definition of a toxic hot spot. It would be confusing to repeat the information in the ranking criteria section. Nothing appears to be gained by duplicating the information.	No	Policy, page xxi-xxii
5.13	The ranking criteria for aquatic life impacts should include an age limit on the data used and some specificity regarding the type of analyses performed.	Aquatic life impact determinations are based on an analysis of the preponderance of information available. The data used to gather evidence was, for the most part, generated from the sampling sites during the BPTCP (i.e., over the last six years). We have no technical reason to exclude biological data that could be used to support a RWQCBs designation of a toxic hot spot.	No	Policy, page xxi
5.14	The water quality objective criteria for ranking is too broad. The term "appropriate analytical methods" must be defined.	This is a region-specific consideration that should be addressed by the RWQCBs. While this term could be described clearly for each chemical, the SWRCB by doing so, may prevent the RWQCBs from using information that are of good quality but inadvertently excluded from the assessment. For data collected as part of the BPTCP, the analytical methods and the quality assurance have been established and endorsed by SPARC.	No	Policy, page xxii
5.15	Water quality objectives or water quality criteria exceedance categories; regularly, occasionally, and infrequently should be defined.	This judgment should be left to the RWQCBs because the information available will have to be evaluated on a case-by-case basis. The SWRCB could define this criterion more specifically (as in Alternative 3) but this may make it difficult or	No	Policy, page xxii

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		impossible for RWQCBs to fit the data to these more specific categories.		
5.16	A catalogue of the reviewed monitoring data used be presented and made available to the public for each sites classified.	In characterizing toxic hot spots, the RWQCB are required in the Policy to provide a list of all references supporting the designation of a THS. All the BPTCP final quality assured data have been made available to the public on the SWRCB web page.	No	Policy, page xv
5.17	The criteria for assigning the rank for aerial extent should reflect both acreage and volume.	Please refer to the response for Comment 5.6.	No	Policy, page xxii
5.18	The source of pollution information should be part of the information included in the description of a candidate THS. However, pollutant source should not be used as a ranking criteria.	Agree. Please refer to the response for Comment 3.2.	Yes	Policy, page xxii
5.19	The natural remediation potential ranking criteria is objectionable because it does not require the regional boards staff to substantiate any determination made in this ranking and the State does not provide any criteria to determine how to apply the ranks.	This criterion requires the RWQCBs to make estimates of the potential for natural remediation. It is necessary for the RWQCBs to use their best judgment of what is known about the possibility for natural remediation at the site. No specific guidance can be given because it relies on the RWQCB staff experience with the site or water body.	No	Policy, page xxii
5.20	The first paragraph of the Sediment Cleanup Methods refers to Known THS. If the proposed policy is intended for the development of Regional Cleanup plans, there will be no "known" THS until the regional plans are approved by their respective regional boards.	Agree. The first sentence of the Sediment Cleanup Methods has been changed to delete the term "known and."	Yes	Policy, page xxiv
5.21	The "Treatment of the site sediments only" section does not address the problem of mixed pollutants in - situ or ex-situ.	This remediation alternative is pollutant specific and will be dependent on the chemical characteristics of the pollutant as well as the physical and chemical characteristics of the sediment at the impacted site. At this point we do not have the information to address this condition fully.	No	Policy, page xxiv
5.22	Selection of the dredging methods to be used should depend on the concentration of the pollutant in the sediment and the amount of re-suspension caused by the dredging operations. The second sentence of the	Agree. The sentence will be changed as indicated.	Yes	Policy, page xxiv+

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
	Dredging section, page. xxv should be revised to read, " Selection of the method depends upon the concentration of pollutants and the amount of .....".			
5.23	The no remediation alternative must be strongly substantiated by the regional board staff and should not involve cost considerations as a priority issue.	Water Code Section 13394(c) requires an estimate of the total cost to implement the cleanup plan be made. As presented in the proposed Policy cost is one of the considerations but by no means the only consideration.	No	Policy, page xxxv
5.24	Add the following language to Prevention of THS' Section: "When issuing WDRs, do not allow the discharge of an identified pollutant that contributes to a candidate/known THS, or further contributes to the degradation of an existing THS."	The proposed language creates a prohibition of pollutant discharge. Prohibitions are certainly one way to stop or remove discharge of pollutants. If needed, the RWQCBs should be allowed to use prohibitions and to use any other reasonable approach to prevent or control the pollutant discharge. A general prohibition for all pollutant discharges that contribute to toxic hot spots is not appropriate.	No	Policy, page xliii
6.1	There is the need for consistent and objective implementation of the policy among the regional boards, including a baseline level of protection for all state bays and estuaries.	Please refer to the response for Comments 5.1 and 5.11.	No	Policy, ranking criteria
6.2	There is a need for mandatory prevention strategies to ensure the cycle of pollution stops and THSs are no longer created.	The Porter-Cologne Water Quality Act and the Clean Water Act creates a mandatory set of rules to prevent and control pollution discharge. The prevention strategies section is intended to go one step beyond and encourage the watershed management when appropriate.	No	Policy, prevention
6.3	The policy allows the regional boards too much discretion in the application of the Specific Definition of a THS to determine candidate sites. There are great discrepancies in how toxic hot spots are identified for toxicity.	The RWQCBs are allowed flexibility in establishing the "p" values to be used in the reference envelope. The factors that should be considered by the RWQCBs are presented in the FED. The SWRCB could pick a specific "p" value but that would not allow RWQCBs to incorporate their region-specific considerations into the assessment. While RWQCBs may pick different values, these values are and should be based on regional needs.	No	Policy, definition

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
6.4	The ranking criteria is too broad and allows the regional boards staff too much discretion on assigning values and establishing the priority of a site.	Please refer to the response for Comment 5.11.	No	Policy, ranking criteria
6.5	The ranking criteria should not be given equal weight, as they do not have equal importance or significance for protection of human health and the environment (Specifically, areal extent, pollutant source or natural remedial potential).	Numerical scores could be given to the various ranking criteria as in Alternative 3. The categorical criteria are general in nature and can only be given different weights if the RWQCB judgment puts more weight on an individual criterion. RWQCB were given this flexibility because of huge differences in environmental conditions throughout the State. There is no straightforward way to give weightings unless numerical scores are given.	No	Policy, ranking criteria
6.6	Divide ranking criteria into two separate sets of ranking. Use "double scores."	This proposal would divide the ranking criteria into six categories. The option would provide greater discrimination of sites. However, such greater discrimination is not needed. RWQCBs can identify high priority sites using the proposed ranking criteria. No benefit of this alternative is apparent.	No	Policy, page xxi-xxii
6.7	A ranking criterion should not be given a "no action" when information on that ranking criteria does not exist. The ranking criteria should be given a default score of "Moderate" until the information needed is obtained.	It does not make sense to assign a site with no information available a moderate priority. If no data or reason exists to set the rank, the site should not be ranked for the specific criterion.	No	Policy, page xxii
6.7a	Sites missing information should be integrated into future work plans.	These sites can be, at the option of the RWQCBs, identified as Areas of Concern. These sites may be better characterized to determine their hot spot status.	No	Policy, page xiv
6.8	Watershed management planning is supported but request that all identified pollutant sources at known THS be required to conduct a pollution prevention audit to provide a menu of options and to make recommendations for action.	This is a site- and problem-specific decision that should be made by each RWQCB as circumstances dictate. It is impossible to give specific guidance on this point because circumstances will vary from region to region.	No	Policy, prevention
6.8a	For THS without known pollutant source, sources should be identified and pollution prevention audits should be carried out.	Please refer to the response for Comment 6.8.	No	Policy, prevention

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
7.1	The specific definition of THS should not include any reference to sites that exceed sediment quality objectives since sediment quality objectives do not exist.	Water Code Section 13391.5 (e) includes sediment impacts in the definition of a toxic hot spot. Please refer to the response for Comment 5.9.	No	Policy, page xviii
7.2	The policy should include the same discussion of the sediment assessment approaches as outlined in the FED.	The discussion in the FED presents the reasons for the approaches taken. The proposed Policy would not benefit from the expanded discussion.	No	Policy, page xviii-xxi
7.3	It is inappropriate to consider pollutant source as a ranking criteria.	Please refer to the response for Comment 3.2.	Yes	Policy, page xxi
7.4	The policy section Sediment Cleanup Methods should be entitled "Toxic Hot Spot Remediation Methods" and should contain detailed information regarding how to address THS that are the result of water quality objective exceedances or fish consumption advisories.	Partially agree. The title will be changed. For the remainder of the comment, please refer to the response for Comment 30.10.	Yes	Policy, page xxiv
7.5	Cleanup costs are not adequately addressed in the proposed policy. Many THS will have to be addressed through broad integrated watershed management programs whose costs have to be projected and included in the cost assumptions for the policy implementation.	Watershed management programs are pollutant- and problem-specific. It is impossible to give specific guidance on the typical watershed management program. RWQCBs need to make their best judgment on the costs of these efforts.	No	Policy, page xliii
7.5a	If the cleanup plans ultimately result in revised discharge requirements, the cost of new treatment systems must be estimated and included.	Please refer to the response for Comment 30.10.	Yes	Policy, cleanup cost
7.5b	The policy must contain an economic assessment providing the projected mitigation costs and the value of the expected environmental benefit associated with the proposed cleanup and prevention actions.	Partially agree. The benefits should be presented but for many of these benefits cost estimates are not available or applicable. The benefits of remediation should be presented but the costs cannot be because they are generally not available. Also, please refer to the response for Comment 12.3 for additional discussion.	Yes	Policy, cleanup and prevention
7.6	Replace existing language in the opening statement of the Prevention of THS section with language referring to preventing THS in lieu of "clean up".	Partially agree. The term "remediate" would be the clearest choice because it includes "cleanup" and "prevent".	Yes	Policy, page xliii
7.7	Revise last sentence of introductory paragraph of The Prevention of THS section, "In revising Waste	Agree. Please refer to the response for Comment 28.1.	Yes	Policy, page xliii

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	Discharge Requirements...".since the discussion that follows describes multi-faceted approaches to prevent THS. Replace sentence with, In the process of developing strategies to prevent toxic hot spots, the RWQCB shall..."			
7.8	Delete last sentence of WDR and NPDES program section referring to "Stricter effluent limits ..." since the statement is not true.	Partially agree. Add phrase at end of sentence: "... in some cases."	Yes	FED, page 99
7.9	The proposed Policy is not clear as to whether BPTCP is a sediment or a water quality program.	The THS definition Water Code Section 13391.5(e) stipulates "hazardous substances accumulated in water or sediment". The proposed Policy states that it applies to all surface waters of enclosed bays, estuaries and coastal waters.	No	
7.10	The Clean Water Strategy should be incorporated into the proposed Policy as a means to address non-localized, non-sediment THS.	Comment acknowledged.	No	Policy, ranking criteria
7.11	Many of the sites listed in the proposed THS Cleanup Plans can and should be addressed through existing regulatory programs.	The policy will act as a planning tool to be used by the RWQCBs to marshal existing regulatory programs. The comment is consistent with the intent of the proposed Policy.	No	Policy, page xliii
7.12	The proposed Policy should require RWQCBs to identify more than just the actions taken at the site, but also include the regulatory program under which the site is being or will be addressed. These sites should be moved to the bottom of the list or exempted from the program.	Sites should not be removed from the cleanup plans if they meet the definition of a toxic hot spot. Please refer to the response for Comment 30.3.	No	Policy, page xliii
7.12a	Sites that will be addressed under existing programs should require no additional action under the BPTCP. These sites should be moved to the bottom of the list of ranked sites or be exempt from ranking and placed on a separate list of sites being remediated through other programs.	Please refer to the response for Comment 7.11.	No	Policy, page xliii
7.13	The proposed Policy does not contain a definition of "unpolluted condition" nor a recommendation for follow-up monitoring that should be used to make the assessment. Cleanup Plans should explicitly state	Please refer to the response for Comment 30.23.	Yes	Policy, page xvii

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	to what level a site should be remediated to allow de-listing from the THS list.			
7.14	Re-evaluate the FED, Environmental Checklist note XII.c., d., e., and g. on the effects on water utility and service systems...The checklist indicates that no impact will result from the proposal, but the Water Code Section 13395 and the Policy focus initial remediation and prevention actions on revision of WDRs.	At this point in the adoption of the cleanup plans no WDRs have been revised as a result of the cleanup planning efforts. In fact the RWQCBs have yet to complete their final regional cleanup plans. It is impossible to consider these impacts now. These potential impacts will be considered in the consolidated plan, if appropriate.	No	FED, page 127
8.1	We agree with the recommendation of the SWRCB staff in the draft FED that the SWRCB adopt guidance for the development of BPTCP cleanup plans that will allow for consistent interpretation and application of the Guidance Policy provisions.	No response is necessary.	No	FED, Issue 1
8.2	Explicit language should be incorporated into the final Guidance Policy that all relevant BPTCP data must be made available for public review in a timely fashion, to allow for evaluation and comment on the data prior to a site being designated as a "known" THS.	Data are being reported by DFG and will be available before the consolidated cleanup plan is adopted. There is no reason to give guidance on this point.	No	
8.3	The guidance document should provide explicit mechanisms for identified responsible parties to comment on and participate in key decisions, such as in evaluation of the efficiency and cost of remedial alternatives.	Responsible parties will be included in the implementation of the plans. They will most likely be responsible for developing detailed assessment of cost-effective ways to remediate the impacted areas.	No	Policy, prevention
8.4	The Regional Boards should conform to the provisions outlined in the Guidance Policy, however, if they deviate there should be an opportunity for public comment.	Please refer to the Response for Comment 13.8.	No	
8.5	The words "associated with" in the FED should be replaced with words "caused by" in identification of a THS.	Please refer to the Response for Comment 13.2, 13.7 and 13.13.	No	Policy, definition
8.6	The Guidance Policy should require evaluation of test results relative to an appropriate reference envelope data set as part of determining whether or not significant toxicity is present.	The proposed Policy does this but allows for an alternate evaluation if reference envelope information is not available.	No	Policy, definition

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8.7	The Guidance Policy should require evaluation of alternatives for technical feasibility, cost-effectiveness, and the need for remedial action based on current impacts and future risks.	It seems that this comment is related to balancing costs with benefits. Please refer to the Response for Comment 12.3.	No	Policy, cleanup and prevention
8.8	The Guidance Policy should include a mechanism for "de-listing".	Please refer to the Response for Comment 3.6.	Yes	
8.9	The Guidance Policy needs to distinguish and define "discharger" and "source", as these terms are used loosely and confusingly throughout the draft document. A need to reflect the fact that a discharger may not be a source, and a source may have no causal connection with particular dischargers	The identification of point sources and nonpoint sources is a task that should be completed by the RWQCBs. It should be left up to them whether parties can be assigned to the likely sources.	No	Policy, prevention
8.10	The Guidance Policy should provide that such 'source identification' not be limited strictly to current geographical proximity or effluent discharges.	This is a region- and problem-specific consideration that should be decided by the RWQCBs. The SWRCB should not provide any specific guidance on this topic.	No	Policy, prevention and cleanup
8.11	The data being used to support the designation of a site as a THS must meet some level of QA/QC compliance.	Much of the data being used to identify toxic hot spots was developed by the BPTCP using the BPTCP Quality Assurance Project Plan (Stephenson et al., 1994). Additional data should be assessed by the RWQCBs for inclusion in the lists.	No	Policy, page xviii-xxi
8.12	A causal relationship between apparent contamination and adverse biological effects (not merely "associated with") should be demonstrated.	Please refer to the Response for Comment 13.2, 13.7 and 13.13.	No	Policy, page xviii-xxi
8.13	The site should be fully characterized. More work should be done before a site is called a known toxic hot spot.	Sites will only be called toxic hot spots if the data from the sites meet the definition requirements. No additional data would be needed to satisfy the definition. Probably the first step in any remediation activity will be to better characterize the site. If more are needed it would delay the development of the consolidated plan and the June 30, 1999 deadline would definitely not be met.	No	Policy, page xviii-xxi
8.14	The concentration of sediment contaminants actually available to aquatic organisms should be determined.	Please refer to the Response for Comment 13.10.	No	Policy, page xviii-xxi

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8.15	The ecological relevance of test species should be evaluated.	The tests used in the BPTCP are the best available measure of organism response and, coupled with benthic community analysis, give very good indications of possible impact. These test methods have been discussed with SPARC and no concerns were raised about their "ecological relevance."	No	Policy, page xviii-xxi
8.16	Artifactual toxicity in the toxicity tests must be ruled out.	Please refer to the response for Comment 12.18.	No	Policy, page xviii-xxi
8.17	Explicit provisions for the performance and interpretation of sediment bioaccumulation tests, which should be subject to public comment, should be incorporated into the Guidance Policy.	"Standard" methods have not been proposed in the Policy because of the need for region- and problem-specific flexibility in performing these studies. The results of bioaccumulation tests can be compared to values suggested in Item 3 of the specific definition of a toxic hot spot.	No	Policy, page xviii-xxi
8.18	In prioritization of sites, again the causal relationships between the contaminants present and the toxicity observed, as well as the potential for contaminant migration and the vitality of the ecosystem that has been established at the site must be considered.	Please refer to the Response for Comment 8.5.	No	Policy, page xxi-xxii
8.19	Any treatment options not on the treatment list in the Guidance Document should be considered if proved to be a viable alternative.	This is true and the proposed Policy allows the RWQCBs to consider other options and alternatives.	No	Policy, page xxiv-xlii
8.20	The Guidance Policy language should be changed to allow for the consideration of the "no action alternative" to be made in parallel with the others.	The proposed Policy puts more weight on the "action" alternatives rather than the "no action" alternative. The intent of the Policy is to come up with ways to address problems not explain why they should not be addressed.	No	Policy, page xxiv-xlii
8.21	Responsible parties for identified sites should have the opportunity to comment on the costs listed.	This is true and the proposed Policy allows for this to happen as part of development of the regional cleanup plans and implementation of the plans.	No	Policy, page xxiv-xlii
9.1	Strongly protest that the notice of public hearing was not provided through the mail.	The notice was made public 60 days in advance of the first public hearing.	No	FED, Ranking

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		This included printing a copy of the notice in several newspapers throughout the coastal areas of the State.		Criteria, Alternatives 3 and 4
9.2	Each criterion in the categorical ranking criteria "high", "moderate", and "low" is too subjective and gives too much flexibility to the regional boards in establishing the priority of a site. Each criterion should be given a numerical value.	Assignment of numerical values is presented in Alternative 3. Comment acknowledged.	No	FED, Alternatives 3 and 4
9.3	Without numeric ranking the human health impacts are exaggerated. It is assumed that the human health advisory is an indication of severely contaminated aquatic habitat.	Human health impacts are not exaggerated using the categorical criteria. The assumption stated is not correct. If there are impacts on human health beneficial uses it is not assumed that aquatic life habitat or beneficial uses are impacted.	No	FED, Alternatives 3 and 4
9.4	Aquatic life impacts appear to use the preponderance of available information (weight-of-evidence) to determine ranking. However, a quantitative statistical analysis of studies performed on aquatic life would further support the significance of the assumption.	No response is necessary.	No	FED, Alternatives 3 and 4
9.5	The water quality objective criterion is not clearly specified. The terms "regularly", "occasionally", and "infrequently" are not measurable in terms of objectives.	Please refer to the response for Comment 5.15.	No	FED, Alternatives 3 and 4
9.6	The interpretation of the areal extent of a site is left to the discretion of the RWQCB staff. No qualitative measures are therefore required.	No response is necessary.	No	FED, Alternatives 3 and 4
9.7	Alternative No. 4 of the FED (page 62) regarding areal extent of a THS does not clearly support the statement of goals in that uniformity and practicality would be considered in the determination areal extent. "If areal extent cannot be estimated this criterion should be assigned a value of no action".	This alternative addresses the mandates of the Water Code for general criteria and has components that addresses each necessary consideration. In this respect, the proposed ranking criteria meet the SWRCB's goals for the program.	No	FED, Alternatives 3 and 4
9.8	Pollutant source and remediation potential alternatives rely on the judgment and experience of the State and Regional staff. FED alternative No. 3 offers a scoring feature which enables staff to apply	Both alternatives allow the RWQCBs to use their judgment in establishing the values for ranking based on natural remediation potential and areal extent. Please refer to the responses for Comments 5.1 and	No	FED, Alternatives 3 and 4

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	the remediation potential criterion to the site's remediation potential.	5.11.		
9.9	SWRCB should consider the adoption of alternative No.3 of the ranking criteria alternatives described in the FED.	Comment acknowledged.	No	FED, Alternatives 3 and 4
10.1	There is a lack of consistency in THS ranking criteria from region to region.	Please refer to the response for Comment 5.11.	No	Policy, page xxi-xxii
10.2	The section on Assessment of areal extent, page xvi; 6A is unclear.	The statement in Item 6A clearly states the SWRCB's intent.	No	Policy, page xvi, 6.A
10.3	Assessment of the most likely sources of pollutants. For sites without sources of pollutants identified, an explanation should be provided as to how this was determined.	The RWQCBs will describe what they do know about sources of pollutants. This may be difficult to describe when information is lacking.	No	Policy, page xvi; 6B
10.4	The statutory requirement that cleanup plans include findings and recommendations concerning the need for establishing a THS cleanup program is missing from the section on the specific definition, of a THS.	This is a SWRCB requirement and the RWQCBs are not mandated to make this finding. It will be included in the consolidated cleanup plan. A section is being added to the guidance on the factors that the SWRCB will consider in the consolidated plan.	Yes.	Policy, page xviii
10.5	It unclear how sites will be ranked using the proposed criteria. Do not use the last three criteria.	Some of these criteria are needed to satisfy the Water Code requirements for the ranking criteria. Please refer to the response for Comment 3.2 for the exception.	Yes (related to "pollutant source") and No for the remainder of comment.	Policy, page xxi
10.6	More specific guidance is needed to ensure that "weight of evidence" criteria are consistent from region to region. The minimum guidance for toxicity should be a P of 10% statewide.	Please refer to the response for Comment 6.3.	No	Policy, page xvii-xviv
10.7	More specificity is needed in defining appropriate analytical methods, and the terms "regularly", "occasionally", and infrequently" in regards to exceedances of the criteria. (Water Quality Objectives).	Please refer to the response for Comment 5.15.	No	Policy, page xxii

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10.8	The criterion for areal extent of a hot spot should be eliminated.	Please refer to the response for Comment 10.5.	No	Policy, page xxii
10.9	The criterion for pollutant source should be eliminated.	Agree. Please refer to the response for Comment 3.2.	Yes.	Policy, page xxii
10.10	The criterion for natural remediation potential should be eliminated.	Please refer to the response for Comment 10.5.	No	Policy, Page xxii
10.11	Tables 2-12 of the proposed policy should include a description of the cleanup methods.	The text and the associated tables adequately described the cleanup methods for the purposes of the proposed Policy.	No	
10.12	The no remediation alternative of the Sediment Cleanup Methods of the proposed policy should be eliminated.	This alternative is needed if cleanup is not feasible. To be complete the SWRCB and the RWQCBs should always consider a "no action" alternative.	No	Policy, page xxv
10.13	The proposed policy is inadequate in the prevention of THS section because it does not require any specific actions, rather it uses language such as "consider", "promote", "encourage", which will result in little or no action.	Please refer to the response for Comment 3.5.	No	Policy, page xliii
10.13	Prevention section items for consideration No. 1 should be modified to say "require use of..." Prevention section items for consideration No. 2 should be changed to say "develop and implement..." Prevention section items for consideration No. 3 should be made more specific as to what actions should be undertaken.	These sections could be made very specific and control-oriented. They are not written in that manner because the RWQCBs need considerable flexibility in applying these conditions to the problems they identify. For example, implementing all of the NPS management strategy may not be what is needed to address the problems identified. Implementation of watershed management approaches are region- and problem-specific. It is impossible for the SWRCB to give the RWQCB specific guidance that will apply to all situations.	No	Policy, page xliii
10.14	A new section should be added saying that the issuance of WDRs should be based on the discharger not contributing an identified pollutant to an existing THS or which may result in the formation of a new THS and regular pollution prevention audits will be conducted and a pollution prevention hierarchy will be instituted.	Please refer to the response for Comment 10.13 and 5.24.	No	

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11.1	We commend you and your staff on the work done to prepare this policy. We are in support of a single, statewide policy establishing consistent and objective planning statewide for each of the RWQCBs.	Comment acknowledged.	No	FED, Issue 1
11.2	A stronger link between the BPTCP and other State and Regional monitoring and enforcement programs would be advocated to promote a more efficient program operation and eliminate unnecessary duplication of efforts.	The links to existing State programs exists (please refer the Issue 6 and the Environmental Impacts section of the FED).	No	FED, prevention, Environ-mental impacts
11.3	Would like a mechanism in place to periodically reevaluate the THS list.	Please refer to the response for Comment 3.6 for our plans to address some issues in the consolidated plan.	Yes	
11.4	We do not feel that the presence of a health advisory should result in an automatic classification of a site or a water body as a candidate THS	Please refer to the response for Comment 3.1.	No	Policy, page xviv
11.5	Ranking should be based on the level of impact of the THS. Identification of a pollutant source does not reflect the toxicity of the THS and should not be taken into account when ranking a THS.	Agree. Please refer to the response for Comment 3.2.	Yes.	Policy, page xxii
11.6	Many of the methods described in the Sediment Cleanup Methods were taken from a single report (National Academy of Science Report). Many of these methods have never been tried on dredge sediments or beyond bench or pilot scale tests or are purely theoretical. This section should focus on true and tried methods which would result in guidance grounded in reality. Addition of a provision to periodically update the list of methods would allow inclusion of more advanced technologies as they become available.	Please refer to the response for Comment 3.3 and 3.4.	No	Policy, page xxiv+
12.1	We support the goals of the BPTCP and appreciate the efforts in preparing the policy and supporting documents.	Comment acknowledged.	No	
12.2	Incorporate a reasonably thorough sediment toxicity survey to ensure the BPTCP is addressing the major sites.	The BPTCP has performed extensive monitoring throughout the State's enclosed bays and estuaries. Measurements have been made on a variety of parameters including toxicity testing, benthic	No	

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		community analysis and chemical measurements. Please refer to Stephenson et al. (1994) and SPARC (1997) for further discussion of the monitoring efforts.		
12.3	Incorporate cost/benefit assessment into the decision making process.	This comment raises a question of whether it is reasonable to cleanup or remediate a site or water body if the benefit received does not roughly equal or exceed the cost. While specific guidance would be difficult, it is possible to provide general qualitative guidance to the RWQCBs on providing not only costs of cleanup but also presenting generally the benefits expected. Even though it is not required by the Water Code, an assessment of the benefits would provide a better characterization of what to expect if the cleanup plans are implemented.	Yes	Policy, Cleanup Costs
12.4	The FED should include a description of how it will be implemented using reference to typical sites and proposed actions.	The RWQCBs developed proposed regional toxic hot spot cleanup plans in December 1997. These proposed plans lay out how the RWQCB will implement the proposed Policy (please note: the proposed Policy was issued as suggested guidance for development of the proposed cleanup plans). The RWQCBs proposed which sites are candidate toxic hot spots, ranked the sites, and planned for the cleanup of high priority sites. The Environmental Impacts section discusses how many sites were identified and their ranks.	No	FED
12.5	It is unclear how the policy will control toxics currently outside the regulatory framework (e.g., diazinon).	In the section of the proposed Policy related to prevention of toxic hot spots it is recommended that the RWQCB consider using a watershed management approach to bring in parties who may cause or contribute to the identified toxic hot spot. The Region 5 cleanup plan provides their preliminary approach to addressing pesticide-related toxic hot spots.	No	Policy, prevention

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12.6	The policy should present separate and independent approaches for sediment and water. Each should have different classification methods and cleanup approaches.	The Water Code integrates water and sediment under the definition of toxic hot spots and make provisions for revising WDRs and addressing water quality certifications related to dredging activities. While it would be possible to separate the two aspects, water and sediment are not separated in the environment. The cleanup planning efforts provide better integration of the water quality functions and the potential exists to address problems more comprehensively in the BPTCP. A section has been added to the Policy and FED on water remediation methods and costs.	No	Policy, definition, prevention, cleanup
12.7	The toxic hot spot definition ignores the mandate that pollution and contamination affects the "interests of the state". The program should take a problem-based approach and should not rely on criteria-based approaches.	The BPTCP has taken a problem-based approach (please refer to the response for comment 12.2). Water Code Section 13391.5(e) requires that a toxic hot spot be identified if water or sediment quality objectives are exceeded. The specific definition addresses "the interests of the state."	No	Policy, definition
12.8	The Policy sets up proxies for water quality objectives. Therefore the SWRCB should follow the procedures for adoption of water quality objectives in water quality control plans.	The proposed Policy establishes guidelines and principles for implementing the requirements of Water Code Section 13390 et seq. Section 13391.5(e) provides a definition of toxic hot spots but does not establish any procedures for adoption of a more specific definition of a toxic hot spot as is proposed for the Policy. There are significant differences between water quality objectives and toxic hot spots. Water quality objectives are levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water. Water quality objectives apply to water bodies. Toxic hot spots are locations in bays and estuaries where beneficial uses are impacted and chemicals may pose a threat to human health and aquatic life. Water bodies or portions of water bodies can be designated as toxic hot spots. In addition, water	No	Policy, definition

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		quality objectives are one of the factors used to designate a toxic hot spot.		
12.9	The policy and FED do not explain the expected and typical results of the implementation of the Policy in specific waterways of the State.	Please refer to the response for comment 12.4.	No	FED
12.10	The alternatives discussed in the FED are not discussed in adequate detail and do not show the effects of using the differing approaches.	To the extent possible, the FED discussed many of the expected effects of the alternatives presented in the FED. Please refer to the Environmental Impact section. We are only required to show the effects of the selected alternative.	No	FED, Environ-mental Effects of the Proposed Policy
12.11	The Policy and FED should describe a procedure for delisting a site after remediation.	Please refer to the response for Comment 3.6.	Yes	
12.12	Mandatory requirements of cleanup plans are missing implementation plan (Water Code Section 13050(j)) and cost/benefit analysis.	Water Code Section 13394 establishes several requirements for the plan to address the problems identified at toxic hot spots. Since cleanup plans are not Water Quality Control Plans as described in the Water Code (Section 13050) they do not need to contain a program of implementation as described in Section 13050(j). Please refer to Comment 12.3 for response on the cost/benefit analysis.	No	Policy, page xiii-xviii
12.13	The policy should require that all sites be included in the cleanup plans (e.g., former military bases).	If the conditions for a toxic hot spot are satisfied at former military bases or any other site, they should be included in the regional toxic hot spot cleanup plan. Nothing in the guidance says these sites should be excluded.	No	Policy, definition
12.14	Chemical characteristics should not be used alone to identify toxic hot spots. The toxic hot spot definition should be made more precise and limit the identification of water column toxic hot spots to locations where anthropogenic sources cause chemical concentrations to become elevated above criteria or water quality objectives.	Chemical measures can only be used alone if the RWQCB determines it has the data necessary to compare to water quality objectives or, if available, sediment quality objectives (Water Code Section 13391.5(e)(3)). In other portions of the definition of a toxic hot spot, chemical measurements are subordinate to measures of beneficial use impacts such as benthic community impacts or toxicity (i.e., chemical measurements are used to show that the	No	Policy, definition

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		pollutant could have contributed or caused the observed effects).		
12.15	The Policy must specify the criteria for determining an appropriate reference site for evaluation of toxicity data.	This is a Region-specific determination that should be based on information collected in the Region and the policy of the RWQCB. The proposed policy sets up a consistent approach for establishing reference sites and conditions but allows the RWQCBs flexibility in establishing the precise critical values for toxicity.	No	Policy, page xviii
12.16	Very minor sites with pollution that does not affect the interests of the State should be classified as de minimus sites.	The State's bays and estuaries are so variable and are affected by so many different circumstances it is difficult to develop a condition that would be considered a toxic hot spot but be so small that it should not be addressed by a RWQCB. The closest the proposed Policy comes to making these kinds of determinations is in ranking sites based on estimated areal extent of the toxic hot spot. The RWQCBs will make determinations on what is appropriate for addressing very small sites.	No	Policy, mandatory requirement
12.17	Identify how to address situations when chemical contamination comes from multiple sources.	This comment is impossible to address as part of the definition of a toxic hot spot. This issue is addressed when RWQCBs begin the process of identifying sources (possibly through watershed management) as discussed in the prevention section of the proposed Policy.	No	Policy, page xix, candidate toxic hot spot, 3
12.18	The FED needs to explain how the impacts of ammonia, sulfides, metals, "simple" organics and refractory organics will be separated.	The definition of a toxic hot spot is based primarily on impacts on beneficial uses (either aquatic life or human health). Chemical measurements are used to satisfy the Water Code definition that requires the SWRCB and RWQCBs to assess if hazardous substances may pose a threat to beneficial uses. Generally, high ammonia or sulfides will rule out a site being a toxic hot spot unless these parameters are discharged from an anthropogenic source.	No	Policy, page xx, candidate toxic hot spot, 4

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		RWQCBs are given flexibility is determining whether pollutants are contributing or could contribute to the impact on beneficial uses.		
12.19	A site should not be considered a candidate toxic hot spot until a significant end-point impact has been developed. Exceeding a numerical water quality objective should not be cause to identify a candidate toxic hot spot.	Please refer to Comment 12.14.	No	Policy, page xxi, candidate toxic hot spot, 1
12.20	Actual examples of the application of the ranking criteria should be provided as required by Water Code Section 13241(b).	The ranking criteria are not water quality objectives and therefore the SWRCB is not required to comply with Water Code Section 13241(b) in this circumstance. Each of the RWQCBs have used the ranking criteria in their proposed toxic hot spot cleanup plans. These plans are referred to in the FED to show how the ranking criteria will be used. Final ranking will be made in compliance with the guidance policy.	No	Policy, page xxi, ranking criteria
12.21	The policy needs to distinguish between general water quality problems (widespread impacts) and local sediment problems.	It is unclear why this distinction needs to be made. Some problems are widespread and others localized depending on the circumstances. Overlapping toxic hot spots will most likely be addressed separately by the RWQCBs. If there is a widespread problem then the RWQCB will very likely use different management approaches than on a small localized site. These circumstances should be addressed by the RWQCBs in the context of all the toxic hot spots identified in the Region.	No	Policy, page xxi, Human Health Impacts
12.22	The intended and appropriate use of Table 1 should be clarified. The relationship between NAS and EPA human health values should be clarified.	Table 1 has two uses: (1) to be used by RWQCBs to address bioaccumulation of pollutants in fish and shellfish, and (2) to assist in the ranking of sites after the toxic hot spots are identified. NAS values are for aquatic life and human health protection and the EPA values are focused on human health protection.	No	Policy, page xxi, Human Health Impacts
12.23	When using the measures of the sediment quality triad, the biological impact measures should have more importance than chemistry. There is a	Hits in all three of the triad measures is considered higher priority than hits in any two (specifically toxicity or benthic community plus chemistry). The	No	Policy, page xxi, Aquatic

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	confusing reference to ranking when only chemistry data is available.	low classification for chemistry alone would be for sites or water bodies that are toxic hot spots that made the candidate list because the site exceeded water quality objectives or for human health reasons. In most cases, biological impact measures are more important.		Life Impacts
12.24	The text refers to "water quality criterion"; presumably this is referring to EPA's 304(a) criteria. Stormwater regularly exceeds EPA criteria.	This is not referring to EPA 304(a) criteria. The reference is referring to the water quality criterion in Federal regulation that is equivalent to water quality objectives described in the Water Code.	No	Policy, page xxii, Water Quality Objectives
12.25	Including chemistry threshold numbers in the ranking criteria inappropriately turns them into regulatory criteria.	This statement is not correct. The ranking criteria are designed to be used only to set priorities on toxic hot spots as described in Water Code Section 13394.	No	Policy, definition
12.26	Sediment quality objectives should be included in the ranking criteria so they can be used when they are eventually developed.	While this could be done it would have no effect on the ranking criteria because there are no numerical sediment quality objectives currently available. Sediment quality objectives should only be mentioned if is required by law (as in the toxic hot spot definition). Please refer to the response for Comment 5.9.	No	Policy, ranking criteria
12.27	RWQCB staff should be allowed to use chemistry data older than 10 years if data are judged to be of high quality.	This is true but it does not seem appropriate to require dischargers to modify WDRs if they have already addressed a past practice (that caused a problem 10 or more years ago). The data used should relate closely to current practices and discharges. The methods used should also be acceptable.	No	Policy, ranking criteria
12.28	Include a "de minimus" value.	Please refer to the response for Comment 12.16.	No	Policy, Page xxii, areal extent of hot spot
12.29	The acreage groupings are too small. Scale up the ranks by two orders of magnitude.	This proposal would provide more discrimination in the use of this criterion. The RWQCB staff suggested this split because the information on areal extent is generally not available.	No	Policy, Page xxii, areal extent

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12.30	Group sediment sites and water sites separately.	Please refer to the response to Comment 12.6.	No	Policy, page xxii, areal extent.
12.31	Guidance on the size and volume of the toxic hot spot should be provided.	This type of information and guidance is not appropriate for the ranking of toxic hot spots.	No	Policy, page xxii, areal extent
12.32	The pollutant source should not be a ranking criterion. The FED should describe more clearly when stormwater systems receive inputs from many contributing sources.	Please refer to the response for Comment 3.2.	Yes	Policy, page xxii, pollutant Source
12.33	It appears that the proposed policy is silent on implementation of the cleanups based on the rankings.	Implementation of the regional cleanup plans will be addressed in the Statewide consolidated toxic hot spot cleanup plan. The regional plans will not be considered final until they are included in the consolidated plan, the SWRCB has made its findings on implementation and all CEQA and APA requirements are completed. A section will be added to the proposed Policy to discuss issues that may be addressed in the consolidated plan.	Yes	Policy, page xxiv, assigning priorities for cleanup
12.34	The policy functions as a water quality control plan and therefore must contain a "program of implementation for achieving water quality objectives" (Water Code 13050(j)).	Please refer to the response to Comment 12.12.	No	
12.35	Both cost effectiveness and cost/benefit should be evaluated.	Please refer to the response for Comment 12.3.	Yes	Policy, cleanup
12.36	The tables should clearly indicate whether they are referring to soils or marine sediments.	The text has been modified to clarify this point.	Yes	Policy, page xxiv, Sediment Cleanup Methods
12.37	Define the source of this classification.	The source of this information is NRC (1997).	No	Policy, page xxvii, Table 3, soil washing

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12.38	Explain how this option differs from "contained aquatic disposal" or from "landfills".	The methods are separate in the NRC document and we have maintained the separation so as not to misinterpret the report findings. Confined disposal involves the placement of dredged material within diked near-shore or land-based facilities. Contained aquatic disposal is a form of sub-aqueous capping. Landfill disposal and the containment of polluted sediments are similar but sediments typically need to be dewatered before disposal in landfills. A description of these cleanup methods are more fully discussed and contrasted in NRC (1997).	No	Policy, page xxxi, Table 8, confined disposal facility
12.39	The FED and policy should assess realistic alternatives only. In-bay or ocean disposal is not likely.	The largest possible array of alternatives are suggested to the RWQCBs. There may be circumstances in the State's enclosed bays, estuaries, or ocean where each of the approaches may be useful. The SWRCB has no reason to exclude any approach in the proposed Policy.	No	Policy, page xxxii, Item 2.D., disposal of dredged material
12.40	This option is not feasible given non-RCRA wastes or special wastes.	If alternatives are not feasible they will not be used by RWQCBs.	No	Policy, page xxxiii, Table 9, contained aquatic disposal facility
12.41	A cost/benefit requirement should be included in evaluation of the "no remediation" alternative.	Please refer to the response to Comment 12.3.	Yes	page xxxv, to xxxvii, no remediation alternative
12.42	The findings required for this alternative will mean that very few sites will meet the requirements. Cost/benefit or secondary impacts may make this the preferred alternative.	The "no remediation" alternative was intentionally made difficult to attain without significant findings in order to prevent no action being taken where remediation is necessary. Natural recovery is of limited effectiveness in preventing pollutants release into the environment because the approach depends on natural processes to bury pollutants (NRC, 1997).	No	page xxxvii, no remediation alternative

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		Please refer to response to Comment 12.3 related to cost/benefit.		
12.43	Selection of the alternative for sediment cleanup is critical and not explained in the proposed policy.	The RWQCBs are permitted to select any or all of the alternatives. This is an important point because the RWQCBs are required to list preliminary actions that could take place (Water Code Section 13394) but are not permitted to select which alternative will be selected and implemented by dischargers (Water Code Section 13360). Selection of the alternative that will be implemented will have to be made in concert with responsible parties.	No	Policy, page xxxvii, alternative discussion
12.44	The costs presented in the table do not reflect the actual costs of disposing sediments. Comparisons should be made to other program costs for waste disposal.	These values are estimates of the costs and do not (and cannot) reflect precise actual costs in each and every case. It is impossible to develop costs for each specific case without actually costing of the specific project. These costs are therefore estimates that will be used by the RWQCBs to plan for cleanup. In all cases the RWQCBs can only suggest how sites should be addressed; it is up to responsible parties to find the most cost effective way to address the identified problems (refer to Water Code Section 13360). For orphan sites, the SWRCB will address this class of site in the consolidated cleanup plan.	No	page xli, Table 13, Sediment Cleanup Costs
12.45	"Interim controls" are not discussed in the proposed Policy.	In the NRC report (1997), two types of controls are discussed: (1) Interim controls and (2) long-term controls. Interim controls are temporary measures that can be implemented quickly before a long-term solution to the problems is selected. The text has been revised to clarify this point.	Yes	page xlii, Table 14
12.46	This section appears to focus exclusively on water column hot spots. No guidance is given on how to address problems with no water quality objectives (e.g., diazinon, chlorpyrifos) .	The section will be modified to clearly state that it applies to sediments as well. Watershed management could be used at the discretion of the RWQCBs to address sites where water quality objectives are not available.	Yes	page xliii, Prevention of toxic hot spots
12.47	The plans should contain a section on the application of the regional plans.	This cannot be included until the consolidated cleanup plan in completed. A section will be	Yes	page xlv, Template

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		included in the proposed Policy that recommends issues to consider in the consolidated cleanup plan.		for Regional Plans
12.48	Reevaluation of WDRs. The policy should present how these Water Code-mandated reevaluations will take place and the SWRCB's expectations on the WDR modifications.	This is an implementation issue that will be addressed in the consolidated toxic hot spot cleanup plan. It is premature to address this issue now. A new section will be added to the Policy on issues that could be addressed in the consolidated plan.	Yes	Policy, prevention
12.49	Focus the discussion on sediment toxic hot spots and rely on existing programs to address water-related toxic hot spots.	Please refer to the response for Comment 12.21.	No	FED, prevention
12.50	Indicate current status of development of sediment quality objectives.	This work has been delayed because funding is not adequate to complete the development of sediment quality objectives as described in the sediment quality objectives workplan adopted by the SWRCB in 1991.	No	FED, page 7
12.51	Include more information on sediment quality and known impairment in California waterways.	This information is contained in the RWQCB's proposed toxic hot spot cleanup plans and status reports of the BPTCP. A reference is made to these reports and the information they contain. A sentence will be added to each description to make it more clear that the information is contained in the proposed cleanup plans.	Yes	FED, page 17
12.52	Enclosed Bays and Estuaries Plans and 303(d)/TMDL efforts provide much or all of the regulatory framework for addressing toxic hot spots in water.	Comment acknowledged.	No	FED, page 25
12.53	Include cost benefits when considering the interests of the State.	The cost/benefit seems to be best considered in assessing the actions that may be needed at a site or water body and not in identifying toxic hot spots. Please refer to the response for Comment 12.3.	Yes	FED, page 29
12.54	Explain the difference between loss of beneficial use, impact on beneficial use and impacts on "interests of the State".	Beneficial use impacts include toxicity and benthic community alteration. Beneficial use loss means generally that the use is so impacted that it is not recommended that it be used (e.g., health advisory on a site or water body) or aquatic life communities are	No	FED, page 29

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		not existing at a site. If beneficial uses are impacted the "interests of the State" are impacted.		
12.55	Explain relationship of human health advisory issued for the water column to sediment site.	The advisory usually applies to a water body or a portion of the water body. The definition of a toxic hot spot says "When a health advisory against the consumption of edible resident non-migratory organisms has been issued ... on a site or water body is automatically classified a 'candidate' toxic hot spot if the chemical contaminant is associated with sediment or water at the site or water body." (emphasis added). If there are water quality or sediment quality data that show that the site could contribute to the health advisory then the site is a candidate toxic hot spot.	No	FED, page 31, human health
12.56	There may be "de minimus" discharges that exceed water quality objectives that do not affect the interests of the State.	Please refer to the response for Comment 12.16.	No	FED, page 38, Chemical measures
12.57	The proposed Policy needs a more thorough discussion of the use and application of the sediment values. There may be many site-specific considerations for use of the values.	The proposed Policy provides the RWQCBs with significant latitude in considering sediment values because of the greatly differing conditions in the State's enclosed bays and estuaries. It is appropriate for these issues to be fully discussed when the RWQCBs develop their final regional toxic hot spot cleanup plans.	No	FED, page 39, chemical measures
12.58	The FED should assess approaches for addressing pollutants, such as PCBs, which are ubiquitous and from diffuse sources.	Watershed management is an ideal approach for addressing pollutants like PCBs. The FED contains proposals for general guidance on watershed management.	No	FED, page 39, chemical measures
12.59	The FED should address inorganic chemicals that are within the concentrations found in nature.	Please refer to the response for Comment 12.57.	No	FED, Page 39, chemical measures
12.60	Clarify the FED and Policy on which EPA criteria are to be used.	In Alternative 3 for the ranking criteria it is suggested that the Clean Water Act Section 304(a) criteria be used in ranking toxic hot spots. This alternative is	No	FED, page 55, EPA 304(a)

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		not the preferred alternative for ranking criteria. No where in the proposed Policy is it suggested or required that Section 304(a) criteria be used for any purpose.		criteria
12.61	Explain why the State of Washington sediment standards were not used.	State of Washington sediment standards were not used because they were developed using only State of Washington data and did not encompass the conditions encountered in California. Conceivably we could calculate similar values (i.e., Apparent Effects Thresholds) using the California data set developed by the BPTCP. The SPARC advised us to use all available approaches such as ERMs, PELs and summary quotients.	No	FED, page 57, Table 3
12.62	Support the use of the general ranking approach. Using pollutant source is not particularly relevant.	Please refer to the response for Comment 3.2.	Yes	FED, page 58, general ranking approach
12.63	Limit discussion to dredging and land disposal, capping, and no action alternative. Other methods are not realistic for California.	Please refer to the response for Comment 12.39 and 12.40.	No	FED, page 66, remed-iation actions and costs
12.64	Given that proposed regional cleanup plans are available, the FED should discuss character, costs and quantity ranges of total sediment needing disposal.	It is likely that the cleanup plans will change as the proposed Policy is finalized and if new information become available to the RWQCBs and are included in the plans. It is appropriate for this kind of assessment to be completed during the development and adoption of the consolidated cleanup plan.	No	FED, page 83, sediment cleanup costs
12.65	The discussion is too general. Discuss specific examples.	The discussion on watershed management is general and was intended to be that way to provide the RWQCBs with flexibility to develop their plans considering their regional needs. It is not necessary to provide detailed guidance on watershed management because each case will be different and	No	FED, Page 93, Watershed manage-ment planning

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		there does not appear to be any reason to limit the RWQCBs in this respect.		
12.66	This program has land use planning powers that should be used as part of the regulatory component of the watershed management alternative.	CZARA should be included in the watershed efforts to the extent it is needed and required. This decision should be made by the RWQCBs as circumstances dictate.	No	FED, page 99, CZARA
12.67	More discussion is needed on how this is a realistic approach for toxic hot spot prevention.	Stormwater management should be included in the watershed efforts to the extent it is needed and required. This decision should be made by the RWQCBs as circumstances dictate.	No	FED, page 100, stormwater program
12.68	The statewide cumulative impacts are not addressed. The SWRCB should consider the impacts of sediment disposal, secondary impacts of dredging, disposal, etc.	When the final regional toxic hot spot cleanup plans are submitted and compiled into the consolidated plans the SWRCB will be able to assess the cumulative impacts of sediment disposal and other impacts that may exist. It is premature to make this assessment now. These types of issues will be contained in the regional cleanup plans. The proposed Policy has been modified to require this information be addressed by the RWQCBs to the extent possible.	Yes	FED, page 102, Environ-mental effects
12.69	Some categories (e.g., IV.c., VI.a., XII.f, XVI.a., and XVI.c.) should be judged to be "less than significant" rather than no impact.	As compared to baseline conditions (the existing process for identifying problems, setting priorities and planning for remediation), we cannot identify any discernible impacts.	No	FED, page 120, environ-mental checklist
13.1	The proposed Policy could readily cause misdesignation and ranking of toxic hot spots and unnecessary economic burden to California.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	Policy, definition and ranking criteria
13.2	The SWRCB needs to adopt a policy that focuses on assessing "real significant" water quality use impairments caused by chemicals that lead to aquatic life toxicity or excessive bioaccumulation of chemicals that represent public health threats.	The BPTCP has used an effects-based approach for identifying toxic hot spots. The approach involves identifying impacts on beneficial uses using measures on the sediment quality triad (benthic community, toxicity and measures of chemical concentrations) for aquatic life assessment and bioaccumulation of contaminants in organism tissues.	No	Policy, definition

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		In designing the BPTCP monitoring efforts we have incorporated the requirements of Water Code Section 13390 et seq. The BPTCP monitoring efforts have focused on measurable endpoints that are considered relevant ecologically and from a human health perspective. This approach measures impairments and meets the requirements of the statutory definition of a toxic hot spot.		
13.3	The Policy can result in increased costs to public and private wastewater and stormwater permit holders and will have little or no impact on the designated beneficial uses. There is a need for a toxic hot spot management program, but the policy falls short.	The proposed Policy will result is a clearer way to set priorities on polluted locations (toxic hot spots) and will result in more consistent planning to address these problems. If there are impacts on permit holders they will be identified when the regional cleanup plans are developed in final form and when the SWRCB develops the consolidated toxic hot spot cleanup plan.	No	Policy, ranking criteria
13.4	There is an inadequate, unreliable database upon which to properly designate and rank toxic hot spots.	The database that has been developed to support the identification of toxic hot spots can be used to meet the requirements of the BPTCP. The data collected are focused on toxic hot spot assessment, have been collected using scientifically defensible procedures, and have passed rigorous quality assurance and quality control. The approaches used have been reviewed by scientists familiar with sediment and water assessments (SPARC, 1997).	No	Policy, definition
13.5	The SWRCB should conduct a detailed economic analysis on the use of the unreliable approaches used by the BPTCP.	There is no requirement for a detailed economic analysis on the BPTCP approaches. The cost of remediation of the sites identified as toxic hot spots will be included in each regional toxic hot spot cleanup plan (Water Code Section 13394) to the extent possible.	No	
13.6	The SWRCB should adopt a Policy that will enable the appointment of an independent expert panel that will develop toxic hot spot designation and ranking criteria.	If the SWRCB took this approach it would not be able to meet the June 30, 1999 deadline for submittal of the consolidated toxic hot spot cleanup plan. It is conceivable that such a panel would take one or more years to redevelop or revise the existing approaches.	No	

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		The suggested approach would make it much more difficult to complete the plans. Also it seems that this proposal would delegate development of the proposal to an expert panel but it is unclear how policy considerations would be included in the effort.		
13.7	The co-occurrence-based approaches for incorporating chemical information in assessing the water quality significance of chemicals as they may impact beneficial uses are technically invalid.	The use of "co-occurrence-based approaches" is only used when there is a need to show that pollutants or hazardous substances are caused by or contributing to the observed impact on beneficial uses. The Water Code definition of a toxic hot spot requires the focus on assessing beneficial use impact and requires that there be a showing that pollution or contamination are related to the impacted use. Section 13391.5(e) does not require a cause-and-effect relationship to be available to determine if a site is a toxic hot spot. The definition states, in part: "Toxic hot spots means locations ...where hazardous substances have accumulated in water or sediment to levels which (1) may pose a substantial present or potential hazard to aquatic life..., or (2) may adversely affect beneficial uses...." The BPTCP has met the requirements of law, focused on beneficial use impairment and used sediment chemical guidelines correctly (SPARC, 1997; Long et al., 1998). The approaches used to show the significance of chemical concentration have been published in the peer reviewed literature and have been reviewed by the SPARC.	No	Policy, definition
13.8	The public should have the opportunity to critically review any proposed change in the Policy before adoption by the SWRCB Executive Director.	This variance provision is provided so the RWQCBs can use an alternate approach not listed in the Policy. The variance does not allow the RWQCBs or the Executive Director to change the Policy. Any provision that is granted a variance will be presented to the RWQCB in a public forum and also to the	No	Page xiii, Introduction

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		SWRCB during the consolidated cleanup plan approval process.		
13.9	The database falls short of providing adequate and reliable information for designating and ranking toxic hot spots.	Please refer to the response to Comment 13.4.	No	page xiv, Monitoring approach
13.10	There has not been a proper incorporation of the toxic-available forms of chemical constituents. This can only be done through sediment toxicity investigation evaluation.	The BPTCP is using the best available information to assess the significance of chemicals. It is clear that sediment-associated pollutants are entering and affecting biological systems. However, the processes responsible for the transfer of pollutants from sediments to animals and the chemical/physical processes and environmental factors modifying these factors remain ill-defined (cf. Landrum and Robbins, 1990). The understanding of the bioavailability of pollutants to organisms is improving however. Ideally, only the bioavailable forms of chemicals would be used; unfortunately, most studies completed to date use total concentration of chemicals. At present it is not possible to use only the bioavailable fraction because these studies are generally not available.	No	page xiv, monitoring approach
13.11	The NOAA sediment values are less reliable than flipping a coin in predicting whether sediments are toxic.	This is not true. Please refer to Long et al. (1998) for an assessment of the predictability of the sediment values. When multiple ERMs or PELs are observed the chance for highly toxic sediments are higher than 50 percent.	No	
13.12	The RWQCBs should discuss the deficiencies in the monitoring approach for properly designating or ranking toxic hot spots.	There is no reason to discuss the deficiencies because the monitoring approach was designed to specifically address toxic hot spot identification and site ranking. Also, the RWQCBs are allowed flexibility in selecting indicators and adjustments to the approach to meet their Region-specific needs.	No	page xiv, Monitoring approach, second paragraph
13.13	The RWQCBs do not have the information to properly characterize a Porter-Cologne pollutant. The BPTCP has not performed the kinds of studies	The first sentence is not correct. Pollution means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects ... the	No	page xiv, Section 5, first

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	needed to couple true pollutants with impairment of beneficial uses.	following: (A) the waters for beneficial uses.... "Quality of water" refers to chemical, physical, biological, bacteriological, radiological and other properties and characteristics of water which affect its use. As discussed in the response to Comment 13.7, the BPTCP monitoring approaches provides the information to identify toxic hot spots and also provides the information to identify pollutants. The kind of studies envisioned in the second sentence of the comment are not required but are not prevented from being completed or used in toxic hot spot evaluations.		paragraph
13.14	The definition of a toxic hot spot will lead to technically invalid and inappropriate designation.	Please refer to the response to Comments 13.2, 13.7, 13.10 and 13.13.	No	page xiv, Section 5, second paragraph
13.15	Additionally the RWQCBs should be required to present a discussion of the technical validity of the listing based on what is known about the chemical impacts on beneficial uses.	This is not necessary because once the proposed Policy is in place it will serve as the basis for establishing their toxic hot spot lists and ranking. There is no need to repeat discussions that have already occurred during the SWRCB proceedings on the proposed Policy.	No	page xv, item D, Reason for listing.
13.16	The term "pollutant" is used synonymously with "chemical constituent". The Porter-Cologne definition of "pollutant" has been ignored.	Please refer to the response for Comment 13.13.	No	page xv, pollutants present at the site
13.17	The assessment of areal extent should be based on toxicity and organisms assemblage alteration. It should not be based on chemical concentrations.	The assessment should be based on all the information available. Information on toxicity and benthic community composition (if available) should be used in addition to measures of chemicals. The section will be modified accordingly.	Yes	page xvi, areal extent
13.18	RWQCBs will only be able to designate that chemicals are elevated. Extensive studies are needed to determine the pollutants responsible for the toxicity.	This section is a preliminary assessment of likely dischargers. Extensive study of the sources is desirable but it is not necessary or required for the RWQCBs to make these findings.	No	page xvi, item B, sources of pollutants
13.19	The RWQCBs do not have the information to say if a	Please refer to the responses for Comments 13.7 and	No	page xvi,

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	pollutant is impacting beneficial uses.	13.13.		item C, summary of actions
13.20	The NAS review falls far short of providing the information needed to develop a credible assessment of the required actions.	The NAS review of sediment methods is the best available information on cleanup methods and cost estimates. Please refer to the responses to Comments 12.43 and 12.44.	No	page xvii, item D, preliminary assessment of actions
13.21	The cost estimates are of little or no value in defining true costs of remediation.	Please refer to the response to Comment 12.44.	No	page xiv, item E, cost estimates
13.22	The proposed Policy creates an "aquafund" where responsible parties can take these matters to the courts and show that the designation and ranking have little or no technical merit.	"Aquafund" is an undefined term; it has no definition in law or Policy to our knowledge. Therefore, it is not possible to respond to whether the proposed Policy creates an "aquafund". Responsible parties can always file lawsuits. The implication is that the proposed Policy is somehow illegal, portions are illegal, or that the scientific portions are not substantiated in the record. In developing the proposed Policy the SWRCB has satisfied legal requirements and provided information in support of the technical approaches used.	No	page xvii, item F, Recoverable costs
13.23	The SWRCB "aquafund" will have even greater problems than EPA's Superfund. Consider putting the Policy into the Basin Plan requirements.	Please refer to the response for Comment 13.22. The Policy is intended to provide a measure of Statewide consistency in development of the regional toxic hot spot cleanup plans. If the provisions of the Policy were placed in the Basin Plans each region would tailor the requirements to their individual needs and it may be impossible to consolidate the regional plans into a comprehensible statewide cleanup plan.	No	page xvii, items D through G
13.24	The SWRCB needs to start over on designation and ranking of toxic hot spots where peer review is used to develop consensus among all stakeholders to avoid unnecessary expenditures for chemical constituent control.	Please refer to the response for Comment 13.6. Additionally, it is unclear how peer review (which is a review by scientists) will be used to develop consensus among stakeholders (which can be scientists and non-scientists).	No	

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13.25	The exceedance (sic) of water or sediment quality objectives for toxic pollutants is not an appropriate criterion for designating a toxic hot spot.	The Water Code requires that if water or sediment quality objectives are exceeded the location should be considered a toxic hot spot (Section 13391.5(e)).	No	page xviii, water and sediment quality objectives
13.26	There is no requirement for aquatic chemistry-toxicology information be developed through TIEs.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	page xviii, item 1, second paragraph
13.27	The chemical association/co-occurrence approach is not a valid approach for assessing whether a chemical constituent is the cause of toxicity at a particular location.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	age xviii, item 2
13.28	If the SWRCB allows the use of a co-occurrence approach (toxicity/benthic community and chemical measurements) there will be "justified litigation" and the approach, "if it receives appropriate judicial review", will "be determined to be inappropriate." Instead use toxic-available chemical forms that impact beneficial uses of a water body.	Please refer to the responses for Comments 13.2, 13.7, 13.13 and 13.22.	No	page xix, first paragraph
13.29	The FDA values are not protective of human health. EPA values are protective. The NAS values are not valid for these kind of assessments.	It is our assessment that the FDA and EPA values are protective of human health. The NAS values are useful for interpreting possible impacts on aquatic life from bioaccumulation of pollutants. To our knowledge the NAS values have not been withdrawn or superseded by other vales and are therefore appropriate to use for this purpose.	No	page xix, item 3
13.30	The only reliable values available for excessive concentrations of chemicals that bioaccumulate are the edible tissue values.	Please refer to the response for Comment 13.29.	No	page xix, section 3, second paragraph
13.31	Use OEHHA guidance for determining the number of replicates.	OEHHA has reviewed the definition of a toxic hot spot during the development of BPTCP. They have not expressed disagreement with these provisions of the specific definition.	No	page xx
13.32	Chemical constituents cannot be associated with	Please refer to the responses for Comments 13.2,	No	page xx,

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	toxic pollutants found in resident individuals with water quality impacts.	13.7 and 13.13.		item 4
13.33	Chemical constituents measured in sediment or water at an elevated level cannot be assumed to be responsible for the demise of aquatic organisms. Co-occurrence approaches cannot be used in a regulatory program.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	Policy, definition
13.34	Do not use human health advisory for ranking purposes because of the politics involved. Use DHS, OEHHA or EPA guidance values.	Human health advisories can and should be used for identifying toxic hot spots and for ranking sites. Health advisories are an acknowledgment that beneficial uses are impacted or lost. To our knowledge, there are no other viable alternatives available to assess human health impacts.	No	page xxi, mid-page, first paragraph
13.35	"Sediment chemistry" is confused with "sediment chemical composition".	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	page xxi, last paragraph
13.36	There is no relationship between chemical concentration of total constituents as measured that determines impacts.	Please refer to the responses for Comments 13.2, 13.7, 13.11 and 13.13.	No	page xxii, first paragraph
13.37	Data should be reviewed with respect to the collection and analysis approaches. Thirty-year-old data can be much more reliable than much of the data that are being collected today.	Please refer to the response for Comment 12.27.	No	page xxii, water quality objectives
13.38	Do not use areal extent criterion. Use real water quality use impairment.	Comment acknowledged. Beneficial use impairment is being used for ranking.	No	page xxii, areal extent
13.39	Do not use pollutant source for ranking purposes.	Please refer to the response for Comment 3.2.	Yes	page xxii, pollutant source
13.40	Do not use the natural remediation potential criterion. The information to make this assessment is not available to the RWQCBs.	Comment acknowledged. This criterion is an estimate based on the experience with and knowledge of the sites being ranked.	No	page xxii, natural remed-iation potential
13.41	This is a superficial treatment of a complex topic.	Please refer to the responses for Comments 12.43 and 12.44.	No	page xxiv, xl;sediment Cleanup

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				methods, costs
13.42	Define sources using TIEs. For new sources, use site-specific risk assessments to identify sources that are likely to be responsible for identifying toxic hot spots.	For sites where sources are unknown these types of analyses seem appropriate. The proposed Policy should not be modified because the RWQCB should be allowed significant flexibility in determining the sources of pollutants. In some circumstances TIEs have been used (Region 5's identification of toxic hot spots).	No	page xlii, prevention of toxic hot spots
13.43	The template falls short of information needed to develop credible toxic hot spot designation, ranking and cleanup plan.	Comment acknowledged.	No	pages xlv and xli, template
13.44	The SWRCB should start over and begin the development of toxic hot spot designation and ranking and provide for full public involvement in implementing the BPTCP.	Please refer to the responses for Comments 13.6 and 13.24.	No	FED, page 1
13.45	Those who advised the Legislature failed to advise them that exceeding a water or sediment quality objective is not a valid basis for defining a toxic hot spot. Directly measure toxicity.	Nonetheless, the Water Code requires that this is one of the specific criteria for identifying toxic hot spots. The BPTCP monitoring approaches measures toxicity directly.	No	FED, page 6
13.46	Reevaluation of waste discharge requirements (as required by Water Code Section 13395) will result in inappropriate changes in WDRs and will place dischargers under a significant financial burden not related to impacts on beneficial uses.	Please refer to the response for Comment 12.48.	No	FED, page 8
13.47	It is readily possible to establish a toxic hot spot definition based on toxicity and organism assemblage information. There is no need to incorporate total concentrations of chemicals to define a toxic hot spot.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 27, first paragraph
13.48	SPARC did not conduct a detailed peer review discussion of issues that would support that the BPTCP monitoring approaches are "scientifically defensible".	This statement is not true. Please refer to the SPARC recommendations (SPARC, 1997). Beyond this review the SWRCB is conducting an additional peer review in compliance with Health and Safety Code Section 57004.	No	FED, page 27, third paragraph

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13.49	The criteria provided for this alternative provide appropriate incorporation of chemistry, not chemical analysis, in the assessment.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 28, Table 2
13.50	The definition of a toxic hot spot should not be tied to the existing monitoring information.	Please refer to the response for Comment 13.4.	No	FED, page 29, Item 3
13.51	Low dissolved oxygen leads to production of chemicals such as ammonia and hydrogen sulfide. These factors may cause the observed effects and should not be ignored.	This is true. No change is necessary in the proposed Policy. Please refer to the response for Comment 12.18.	No	FED, page 29, Item 5
13.52	Indicators (such as biomarkers) that are not related to beneficial use impairment should not be used.	Agree. Biomarkers are not included as a category of indicators. These indicators were remove after the SPARC review (SPARC, 1997). No change in the proposed Policy is necessary.	No	FED, page 29, Item 6
13.53	The SWRCB should use procedures that can be used to determine whether the toxicity is caused by, not associated with chemical measurements.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 38, mid-page, chemical measures
13.54	Equilibrium partitioning assumes that chemical constituents in sediments are in equilibrium.	Agree.	Yes	FED, page 38, last paragraph
13.55	Some component of the equilibrium partitioning is associated with ingestion of sediment particles by some forms of aquatic life.	Agree.	Yes	FED, page 39, top of page
13.56	EPA is abandoning the development of sediment quality criteria.	Agree. EPA appears to be pulling back some of the sediment values they have previously published. EPA recently used the SQC to evaluate chemistry data in the National Sediment Inventory.	Yes	FED, page 39, first paragraph
13.57	The ERM and ERL values are not valid for estimating the effects of chemical constituents on aquatic life.	Please refer to the responses for Comments 13.2, 13.7, 13.11 and 13.13.	No	FED, page 39, Item 2, first paragraph
13.58	Apparent Effects Thresholds do not provide a cause and effect relationship necessary to properly define the cause of toxicity.	Please refer to the responses for Comments 12.61, 13.2, 13.7 and 13.13.	No	FED, page 40, Item 3

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13.59	Do not use correlations between toxicity and chemicals to show relationships.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 41, Item 4
13.60	Multivariate analysis can lead to inappropriate assessment of the cause and effect between chemicals and toxicity.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 41, Item 5
13.61	TIEs are the only procedures that can be used to determine whether chemical constituent causes toxicity. It is better not to have "cookbook-type" procedures that can be used by the unqualified.	Please refer to the responses for Comments 13.2, 13.7 and 13.13. Procedures are developed and should be used as a basis for this type of study.	No	FED, page 41, item 6
13.62	Using a Weight-of-Evidence" is an appropriate approach; but using an approach with a chemical component is not appropriate.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 41, Item 7
13.63	The reports of monitoring information that have been generated have limited reliability in terms of identifying the chemicals responsible in determining the cause of toxicity.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 42, first full paragraph
13.64	There is no way to relate exceeding a water or sediment quality objective to beneficial use impairment.	Please refer to the response for Comment 13.25.	No	FED, page 42, water and sediment quality objectives
13.65	An alternative is not presented that properly incorporates chemistry into the evaluation and an associated economic analysis.	Please refer to the responses for Comments 13.2, 13.7 and 13.13.	No	FED, page 42, staff recommend ation
13.66	The SWRCB never responded to the comments made on the 1993 version of the ranking criteria. Those comments and responses should be included in the administrative record.	Comment acknowledged.	No	FED, page 44, issue description
13.67	The assumption is not appropriate. The SWRCB could identify the toxic hot spot and then perform additional studies to determine its rank.	The approach advocated in this comment would require additional study before sites could be ranked. This approach would delay completion of the regional cleanup plans and would consequently delay	No	FED, page 45, bottom of page

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		the completion of the consolidated cleanup plan. By taking this approach the consolidated plan would not be completed by June 30, 1999.		
13.68	The ranking should be based on impact to beneficial use, not the cost to clean up.	Water Code Section 13393.5 requires the SWRCB, in part, to adopt ranking criteria that take into account "...the extent to which the deferral of a remedial action will result, or is likely to result, in a significant increase in environmental damage, health risks, or cleanup costs." Additional factors (such as areal extent and remediation potential) are needed to satisfy the Water Code requirements.	No	FED, page 45, Item 3, assump-tions
13.69	The BPTCP is an aquatic "Superfund" (aquafund) program. It should be subject to the same degree of rigor as the land-based Superfund program.	Please refer to the responses for Comments 13.22 and 13.23.	No	
13.70	Alternative 3 should be rejected in favor of an alternative where the professional judgment of a panel of experts would advise the RWQCBs on designating and ranking toxic hot spots.	Please refer to the responses for Comments 13.6 and 13.24. Additionally, identifying and ranking toxic hot spots is a Water Code-mandated responsibility. It does not seem feasible to delegate this responsibility to a "panel of experts."	No	FED, page 49, weighted numerical ranking criteria
13.71	Do not use NAS guidelines, whether water quality objectives are exceeded, or ERMs, ERLs, and PELs values.	Please refer to the responses for Comments 13.2, 13.7, 13.11, 13.13 and 13.29.	No	FED, page 51, chemical measures
13.72	Pollutant source, remediation potential, etc. should not be used to rank sites. Ranking should be based on "water quality-use impairment significance".	Please refer to the responses for Comments 3.2, 13.38, 13.39, and 13.40.	Yes (for pollutant source) and No (for the remainder of the comment)	FED, page 52
13.73	Do not use these measures because there is no relationship between the value and water quality problems.	These values have been useful in interpreting bioaccumulation monitoring data and for the purposes and in the context of the weighted ranking criteria (Alternative 3) could assist the RWQCB in establishing priorities.	No	FED, page 53. MTRLs
13.74	Rare, threatened or endangered species should be used only if they are being affected by the toxic hot	Comment acknowledged.	No	FED, page 53,

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	spot.			bottom of page
13.75	If multiple chemicals are present, it is arbitrary to multiply the factor by 2.	This factor is proposed to account for situations when there is more than one pollutant suspected of causing the identified problem. Multiplying by two provides a way of increasing priority based on multiple chemicals.	No	FED, page 54, chemical measures
13.76	Delete reference to NAS values.	Please refer to the response for Comment 13.29.	No	FED, page 54, last paragraph
13.77	The EPA criteria when appropriately used are more reliable than most of the parameters used for ranking toxic hot spots.	Please refer to the response for Comment 13.29.	No	FED, page 55, third paragraph.
13.78	The table should be deleted as it provides unreliable information which will be inappropriately used to assess the significance of chemical constituents in sediments.	Please refer to the responses for Comments 13.2, 13.7, 13.11, 13.13, and 13.29.	No	FED, page 57, Table 3
13.79	This section provides distorted information on incorporating chemical issues into assessing toxic hot spots.	Please refer to the responses for Comments 13.2, 13.7, 13.11 and 13.13.	No	FED, page 56, sediment values
13.80	Areal extent should be based on actual impacts on organisms or as a source of bioavailable forms of chemicals.	Please refer to the responses for Comments 13.2, 13.7, 13.13 and 13.17.	No	FED, page 56, areal extent
13.81	These are not appropriate ranking criteria.	Please refer to the responses for Comments 13.38, 13.39 and 13.40.	No	FED, page 56, pollutant source and remediation potential
13.82	Numeric scores have no meaning and should not be used.	Numeric scores are not calculated for the Categorical Ranking Criteria.	No	FED, page 58 and 59

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13.83	Delete NAS values from the table as none of these are applicable today.	Please refer to the response for Comment 13.29.	No	FED, Table 4.
13.84	The NAS values, various correlation techniques, etc. are not reliable for the purposes of identifying and ranking toxic hot spots.	Please refer to the response for Comment 13.29.	No	FED, Page 61, aquatic life impacts
13.85	Alternative 4 is fundamentally flawed analysis of the parameters to rank toxic hot spots.	Please refer to the responses for Comments 13.38, 13.39 and 13.40.	No	FED, page 63, staff recommen-dation
13.86	Add a third alternative that puts control of the program in the hands of a public advisory panel to direct the development of the cleanup plans.	Please refer to the responses for Comments 13.6, 13.24 and 13.70.	No	FED, page 65
13.87	This section is not an adequate base for developing cleanup plan remediation approaches and costs.	Please refer to the responses for Comments 13.20, 12.43 and 12.44.	No	FED, page 66+
13.88	TMDLs ignore fundamental principles of water chemistry, water quality and toxicity impacts and control. Focus on toxic forms of constituents.	Comment acknowledged.	No	FED, page 97, TMDLs
13.89	Large amounts of public funds could be wasted through misdirected efforts outlined in the proposed Policy.	Comment acknowledged.	No	FED, page 102+
13.90	The SWRCB must address the potential costs and inadequate discussion of economic issues related to designating and ranking toxic hot spots. OAL has grounds to reject the proposed Policy as being inadequately developed.	Please refer to the responses for Comments 13.3 and 13.5. The SWRCB will comply with all the requirements of the Administrative Procedure Act before it is submitted to OAL for their review.	No	FED, page 102+
14.1	The organizations sending the letter have serious concerns with the Board including nonpoint sources in the BPTCP.	In order for toxic hot spots to be prevented all sources of pollutants should be involved in the prevention efforts. NPS should be included in the BPTCP as should point source dischargers.	No	Policy, prevention
14.2	It is inappropriate to include nonpoint sources because the program is a point source program.	This is not a true statement. The BPTCP has never been exclusively a point source program. Water Code Section 13392 states, in part, that: "...the state and regional board shall ... develop appropriate prevention strategies including...development of new	No	Policy, prevention

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		programs to reduce urban and agricultural runoff." The BPTCP should be and is focused on point and nonpoint sources of pollution.		
14.3	The MAA between the State Board and the PMP is the preferred means to address pesticide related water quality impairment.	The MAA provides ways for the SWRCB and DPR to coordinate their responsibilities. To our knowledge nothing prevents the RWQCBs from addressing these water quality impairments in regional cleanup plans.	No	Policy, prevention
14.4	Chemicals found at specific locations in episodic patterns should not be swept into the BPTCP regulatory scheme.	If impacts are occurring in water bodies covered by the BPTCP and the definition of a candidate toxic hot spot is satisfied, then a site should be included and addressed in the cleanup plans.	No	Policy, definition
15.1	The Policy adopted by the SWRCB to establish toxic hot spots must be consistent in all regions. RWQCBs must be given specific criteria to apply with little discretion to modify those criteria.	We agree that the ranking criteria should be consistent in all Regions and that the criteria should not have the discretion to modify the guidance. The guidance should also be general enough to apply in the diverse conditions in the State's enclosed bays and estuaries. Please also refer to the response for Comment 5.1 and 5.11.	No	Policy, ranking criteria
15.2	The legal authority of CERCLA/Superfund vs. the BPTCP needs to be addressed. An agency performing cleanup actions mandated by CERCLA is not liable to lawsuits under the CWA as long as the approved CERCLA cleanup action is followed. Will this immunity apply to BPTCP legal actions?	The BPTCP is independent of other programs and is not bound by the mandates in the Federal Superfund program. Whatever liability or immunity is applied will be in compliance with the Porter-Cologne Water Quality Act and the Clean Water Act to the extent this Federal law applies.	No	
15.3 and 15.4	The final results of the BPTCP do not meet the scientific considerations suggested by SPARC. on p. 27-29 of the FED. The weak correlation between sediment chemistry and sediment toxicity, as well as the qualitative nature of the benthic analysis conflict with the SPARC recommendation that "biological response should be associated with the presence of non-naturally-occurring toxic pollutants."	Please refer to the response for Comment 13.2, 13.7, 13.11, and 13.13. The proposed Policy and the FED are in agreement with the SPARC recommendations with respect to this point. SPARC said that the BPTCP monitoring information is sufficient to identify problems and move to the next level of responsible party investigation.	No	FED page 27-29
15.5	The data from the BPTCP does not support delineation of toxic hot spot boundaries.	This is true. For the most part additional site characterization is needed as part of implementation of any remediation activities. It is recommended in	No	Policy, areal extent

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		the Policy that the first step in implementation is better characterization of sites.		
15.6	Page 156 of the San Diego report states that "...sampling ..to quantify areal extent of an impacted area must be addressed during extensive site characterizations."	Please refer to the response for Comment 15.5.	No	
15.7	Page 155 of the San Diego Bay report states: "...the results also should be confirmed with further studies before any adverse ecological impacts can be conclusively demonstrated."	Please refer to the response for Comment 15.5.	No	
15.8	It is not clear how the study determined the 0, 1, or 2 rankings for the benthic assessment. It appears that there was no comparison of these numbers to reference sites for any of the samples. The proper use of reference sites are very important for benthic community studies.	The explanation for the evaluation of the benthic community data is presented in the San Diego Bay report (Fairey et al., 1996).	No	
15.9	Since the BPTCP data was collected, some areas may have been cleaned up, or otherwise altered. This data should be considered before cleanup plans are imposed or required.	Agreed. The RWQCBs should not require that areas that have already been cleaned up be remediated again. The RWQCBs are compiling the actions already completed at the sites so no duplication of effort occurs.	No	
15.10	Dischargers may be identified as a matter of convenience in areas of long use (historical contamination).	No response is necessary.	No	Policy, page xvi
15.11	As written, the policy calls for determinations after two sampling events, but the time interval has not been specified. At a minimum, at least two sampling events, at least one year apart must be included in the definition.	The determination of when sampling events occur is a situation- and Region-specific decision. No time interval can be specified because some situations require resampling within days or weeks while other situations can be delayed substantially longer.	No	Policy page xviii
15.12	Recommend adoption of weighted numerical ranking criteria to rank toxic hot spots. Human health considerations should have more weight.	Comment acknowledged.	No	Policy page xxi
15.13	If environmental effects of cleanup are more damaging than leaving the sediment in place, the site should not be cleaned up. As written, the site must be cleaned up, causing more damage than leaving the	The other information is needed to adequately analyze this alternative and characterize the site. The proposed Policy does not require that the "no action"	No	Policy, remediation alternatives

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	site undisturbed.	alternative not be considered. The Policy states it should be considered last.		
16.1	The FED states that the Policy is applicable to the "surface waters" of the state in Regions 1, 2, 3, 4, 5, 8 and 9. This is incorrect and inconsistent with Section 13391.5(e) of the Water Code. Fig. 1 could be misinterpreted.	Section 13391.5(e) states that toxic hot spots can only be identified in enclosed bays, estuaries or the ocean. There is no requirement that action be taken to address the problems found at toxic hot spots. In fact, the Water Code (Section 13392) says "the state board and regional boards shall ... identify specific discharges or waste management practices which contribute to the creation of toxic hot spots and shall develop appropriate prevention strategies including ... more stringent waste discharge requirements, onshore remedial actions, adoption of regulations to control source pollutants, and development of new programs to reduce urban and agricultural runoff." Since many of these kinds of actions are on land and upstream from bays and estuaries, the recommended actions should apply to surface waters in the Regions.	No	FED, page 11
16.2	Discounting smaller sites in ranking because they may be difficult or not practical to remediate seems counter-intuitive. Larger sites should be discounted for those reasons.	Please refer to the response for Comment 12.16.	No	FED, page 62
16.3	Extend the watershed management approach to include an "airshed" component to include sources in a larger geographic scale.	If the "airshed" is a source of the pollutants then it should be included in the water shed efforts. However, this assessment should be made on a site- and Region-specific basis because not all watersheds will need an "airshed" component.	No	Policy, prevention
17.1	Extend the deadline for comments by two weeks.	The deadline was extended from May 11, 1998 to May 15, 1998.	No	
18.1	The time schedule identified for assessing areal extent, preliminary cleanup alternatives and estimated cleanup costs seems unrealistic. The process being considered should address this inevitability.	It is acknowledged that full implementation of the plans will take a long time to implement. The cleanup plans are a planning tool to be used by the RWQCBs and the SWRCB to address toxic hot spots. It is probable that the responsible parties will be brought into the process to assist in making the remediation planning more specific.	No	

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18.2	The Policy and FED should describe a procedure for delisting a site based on supporting data, remediation, or sites being addressed under other federal or state programs.	Please refer to the response for comment 3.6.	Yes	
18.3, 18.4, and 18.5	If a dredging program is considered as a cleanup alternative, the dredging project will require CEQA/NEPA compliance. The FED needs to more fully address alternative projects, a "no action alternative", and other issues as they relate to state and Federal regulations.	Please refer to the response for Comment 12.43 and 12.4. The SWRCB and RWQCBs cannot by law (Section 13360 of the Water Code) select the preferred alternative for remediation at a site. That will be done in cooperation with responsible parties. If NEPA or additional CEQA analyses are needed they will be performed when the plans are implemented.	No	Policy, remediation alternatives
18.6	Pollutant source should not be used as a ranking criterion.	Please refer to the response for Comment 3.2.	Yes	Policy, page xxii
18.7	In the Policy, the no action alternative is the last alternative considered, and is only considered if cleanup of the site would be detrimental. The selection of a cleanup method should be that which results in the greatest net environmental benefit for the site.	This is the intent but "net environmental benefit" is very difficult to define (notwithstanding the use of "net environmental benefit" for certain circumstances in Region 2). While the "no action" alternative may be the best alternative for a site, this will not be known unless the other alternatives are analyzed first.	No	Policy, remediation alternatives
18.8	Using FDA or NAS level exceedances or OEHHA health advisories for listing sites automatically as candidate or toxic hot spots does not provide adequate information to develop a detailed remedial action plan. These criterion should only be used for initial screening, use a triad approach for final designation.	Please refer to the response for Comment 3.1 and 13.29. Possible impacts on human health (i.e., health advisories) cannot be confirmed using measures of impacts on aquatic life. Impacts on aquatic life do not necessarily mean there will be impacts on human health, and vice versa.	No	Policy, definition
19.1	Chevron supports the comments of the Western States Petroleum Association (Commenter 18).	Please refer to the responses for Comments 18.1 through 18.8.	No	
20.1	A weight of evidence approach should be used in the definition by requiring that two or more of the criteria be met for designation as a candidate or known toxic hot spot.	Please refer to the response for Comment 30.5.	No	Policy, definition
20.2	Need more than one reference site.	In evaluating toxicity the reference envelope approach considers and uses information from more than one site (cf. Fairey et al., 1996).	No	Policy, definition

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20.3	Recommend that the criterion for areas with fish consumption advisories to automatically be considered toxic hot spots be removed, since there is no way to tell where the fish became contaminated.	Please refer to the response for Comment 3.1.	No	Policy, definition
20.4	Remove pollutant source as a ranking criterion.	Please refer to response to Comment 3.2.	Yes	Policy, ranking criteria
20.5(a)	The requirement to remedy or restore a toxic hot spot to an unpolluted condition is not measurable or practicable.	Please refer to the response for Comment 30.23.	Yes	Policy, mandatory requirement
20.5(b)	Sites identified due to water and/or fish tissue contamination, without associated sediment contamination should be addressed under other existing water quality programs.	Please refer to the response for Comment 30.3, 30.18, 30.22.	No	Policy, prevention
20.6	The section on cleanup alternatives needs to be more extensive. Also, cleanup only refers to sediment cleanup, not water column or fish tissue cleanup. These need to be addressed under other programs.	Please refer to the responses for Comments 12.43 and 12.44.	No	Policy, prevention
20.7	The FED should be modified to include activities of other state and Federal agencies to address toxic hot spots and specify that these sites should not be identified as candidate or known toxic hot spot to assure there is no duplication of effort	Please refer to the response for Comment 7.11, 7.12, and 30.3.	No	Policy, prevention
20.8	Concur with the use of watershed management approach, but recommend use of more specific guidance to the Regional Boards	Partially agree. The proposed Policy should be modified to require that the RWQCBs provide as part of cleanup plan implementation, site-specific and pollutant specific strategies to address the toxic hot spot.	Yes	Policy, page xliii.
20.9	Need more thorough analysis of potential environmental impacts of the proposed policy with respect to cleanup actions.	Please refer to the response for Comment 30.29 and 30.30.	No	FED, environ-mental impacts
21.1	In general, comments are supportive of staff recommendations.	Comment acknowledged.	No	
21.2	Source of sediment samples is unclear. Was sampling surficial, at a certain depth or homogenized	Sediment samples were collected generally in the top 2 cm of surficial sediments (in some circumstances	No	

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	over a wide interval.	the top 5 cm were collected). These samples were then homogenized. All field and laboratory procedures are presented in the BPTCP Quality Assurance Project Plan (Stephenson et al., 1994).		
21.3	Consider the depth distribution of the contaminants. When ranking criteria are evaluated, the depth distribution is important in anticipating potential availability and toxicity.	The concentration of pollutants at depth in the sediment is very important for determining and possibly predicting the potential availability and toxicity once these sediments are dredged. These are the types of factors that should be considered in the implementation of the cleanup plans (i.e., when responsible parties are evaluating remediation options). This type of study is not needed to determine if surficial sediments are impacting beneficial uses. This should be included in the factors necessary to fully characterize a toxic hot spot.	Yes	Policy, page xvi
21.4	The text depends heavily on the 1997 NRC report, and there is very little experience in sediment remediation other than dredging. The endpoint of remediation actions is not indicated in the Policy, and the NRC document provides little guidance. Also, there is little guidance on how the areal and vertical extent of contamination is determined.	The decision on cleanup level should be made on a pollutant- and site-specific basis. We agree that general guidance is appropriate and have changed the proposed Policy to include a general analysis of the benefits that may occur after addressing problem sites. Please refer to the response for Comment 12.3.	Yes	Policy mandatory requirement
22.1	Extend comment period by 14 days.	Comment period was extended from May 11, 1998 to May 15, 1998.	No	
22.2	Coordinate with DPR through the existing MAA.	RWQCBs will implement the MAA with DPR and will coordinate with DPR on the development of cleanup plans for pesticides.	No	Policy, prevention
22.3	The policy for Toxic Hot Spots if vigorously implemented with the current language will have a potential negative impact on key agricultural growing areas in California.	Disagree. No specific information was provided to support this hypothesis.	No	
22.4	How the Environmental Checklist was derived to indicate "no impact" for "affects agriculture resources or operations."	Best professional judgment was used to come up with this determination. The commenter did not provide any data to the contrary determination.	No	FED, environ-mental checklist

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22.5	The process by which CVRWQCB used for the listing of toxic hot spots for non-point source pesticide detections is inappropriate (page 26).	This is not a comment on the proposed Policy. The potential harmful effect of pesticide on aquatic organisms does not depend on whether the toxicant is from point source or nonpoint source.	No	
22.6	The scientific data for currently registered pesticides which are detected clearly shows that they will fit into the lower priority category, as a worst case scenario (page 28).	Disagree. Although the recommended criteria are for sediment quality assessment strategy, the pesticides meet the criteria for some the lower priority as well as some criteria for higher priority.	No	
22.7a	The agencies represented in the MAA should agree on the listings, prior to placing the non-point pesticides on either candidate or known hot spots (page 30).	The MAA is one way to address impacts from pesticides. To our knowledge nothing prevents the RWQCBs from addressing these impairments independently in regional cleanup plans.	No	Policy, definition
22.7b	"Significant toxicity" should not be defined wholly by single species toxicity tests, but should allow for the inclusion of ecological risk assessments, when available.	The RWQCBs are not prevented from using the information from "ecological risk assessments" in identifying toxic hot spots. As long as the information is of high quality and addresses the provisions of the definition, the data can be used. Single species toxicity tests provide essential information for assess aquatic organism response and for assessing impacts on beneficial uses.	No	Policy, definition
22.8	Use multiple species and community level effects in assessing the benthic community structure and function for toxicity testing and interpretation of toxicity data (pages 31-37).	Toxicity testing is one type of measure that gives the SWRCB and RWQCBs an indication of beneficial use impairment. Toxicity tests are well developed, measure meaningful organism response and get at what is causing the animal response (when TIEs are completed). Community level information and toxicity are independent measures of effects on organisms (SPARC, 1997).	No	Policy, definition
22.9	The affected parties be allowed to meet with the SWRCB, appropriate RWQCB, and DPR under the Pesticide Management Plan portion of the MAA to present any additional science that may be available; and no THS be listed until all agencies listed under	The Water Code (Section 13394) states that it is a RWQCB responsibility to identify toxic hot spots. Coordination with DPR as stated in the MAA is necessary and has been done. It is acknowledged that the toxic hot spot listing may impact dischargers	No	FED, page 42

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	the MAA agree. The listing of THS will impact agriculture in affected areas (page 42).	but it is premature to state precisely how.		
22.10	Coordination with other parties under the PMP re: MAA is needed prior to any listings of known or candidate toxic hot spots (page 58).	Please refer to the response to Comment 22.9.	No	FED, page 58
22.11	Modern ecological risk assessment models or studies should be included in "preponderance of information" (page 58). The ability to classify a THS based on two TIEs is too stringent and will lead to many potential listings, which will take funds from the most toxic sites and dilute them over all state. No THS should be assigned a "High" priority unless all agencies operating under the MAA agree.	Please refer to the response to Comment 22.9 and 22.7b.	No	FED, page 58
22.12	"Scientifically defensible ecological risk assessments" should be added to the weight of evidence for aquatic life impacts (page 61).	The approaches used by the BPTCP are scientifically defensible and do not prevent the use of ecological risk assessment information. Please refer to the response to Comment 22.7b.	No	FED, page 61
22.13	"Prevention programs (implemented through permits)" discussed under the section on Pollutant Source and Remediation Potential (page 62) will not work for production agriculture, unless these permits are developed under the MAA and implemented by DPR with the help of the UC Cooperative Extension. A special section is needed to fully describe how these "permits" will be incorporated into agricultural (and some urban) areas. The SWRCB cannot take what is essentially a "point source" program and expect it to work in the nonpoint source arena, without significant outreach.	Comment acknowledged. Ranking sites using remediation potential will work, we are not ranking industry types. WDRs may not be issued to agricultural dischargers but if they contribute to a water quality problem, they should be included in addressing the problem. Please refer to the response to Comment 3.2, 14.2, 22.9, and 28.1.	Yes	FED, page 62
22.14	Disagrees with staff's reasons for recommending alternative 2 (watershed management planning) for THS prevention strategies (pages 92 through 100). Recommends adoption of alternative 1 (point source pollution control strategy only), which will get the most done, per dollar spent. Since several programs are in place for the nonpoint source issues and a THS	There is a great need to address all sources of pollutants that discharge into a water body. Watershed management approaches allows this to happen. Generally, point sources have been well regulated and incremental improvement in these discharges are very expensive. The RWQCBs have a responsibility to address toxic hot spots if the data are	No	FED, pages 92-100

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	designation is not needed.	available to do so. Please refer to the response for Comment 28.1.		
22.15	The MAA should be referenced under 'Regulatory" discussion (page 98). No listing or regulatory actions should take place until all MAA agencies agree.	Agree.	Yes	FED, prevention section
22.16	Add the word 'deny' to the second sentence in fifth paragraph under Proposed Policy (page 108): "Any site designated as an area of concern will be considered for further monitoring to confirm *or deny* preliminary indications of impairment."	This change is not needed because denying a site designation is not possible as more than one sampling event many be completed that may reveal impacts on organisms.	No	FED, page 108
22.17	The paragraph under the discussion of Proposed Policy for issue #6 : Toxic Hot Spot Prevention Strategies and Costs (page 116) should be amended to include all MAA agencies for pesticide issues, CDFA, UC Cooperative Extension.	The guidance restates the NPS Plan requirements for addressing NPS problems and encourages the RWQCBs to involve all interested parties in the development of prevention strategies.	No	FED, page 116
23.1	Commenter supports the fundamental objectives and technical basis for the BPTCP.	Comment acknowledged.	No	
23.2	Promote consistency among Regions with respect to interpretation and implementation strategies.	The proposed Policy does this. Please refer to the response for Comment 5.1 and 5.11.	No	
23.3	Develop a guidance document to promote consistency with input from the public, including industry.	The SWRCB has solicited public input on the proposed Policy.	No	
23.4	The criterion for areal extent, pollutant source and natural remediation are most contentious. Need detailed chemical characterization of all input sources.	Comment acknowledged. Detailed assessments are necessary when RWQCBs begin the process of implementing the cleanup plans and it is appropriate to complete these studies at that time. An absolutely complete assessment of the pollutant sources is not necessary for ranking because the RWQCB are given flexibility to estimate the information. Please refer to Comment 3.2 for the pollutant source.	Yes (for pollutant sources) and No for other portion of comment.	
23.5	Need a sampling approach that defines a three-dimensional volume of contaminated sediments for determining areal extent of a toxic hot spot.	Please refer to the response for Comment 21.3.	Yes	Policy, remediation alternatives
23.6	Potential for natural remediation of contaminated sediments is not well known.	Comment acknowledged.	No	Policy, remediation alternatives

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23.7	Ranking criteria needs work, and the criteria needs to be consistent statewide.	Comment acknowledged. Please refer to the response for comment 5.11	No	Policy, ranking criteria
23.8	Do not use fish tissue contaminant concentrations to determine toxic hot spot, except as part of a weight-of-evidence consideration. Exposure histories of fish cannot be determined.	Please refer to the response for Comment 3.1.	No	Policy, definition
23.9	Sediment threshold effects levels (e.g., ERMs) should be refined, especially for contaminants such as the chlorinated pesticides. Decisions concerning site identification, ranking and cleanup requirements should not be based solely or primarily on effects as thresholds are variable or poorly defined.	The BPTCP definition relies on the use of impacts on beneficial use primarily and then the use of sediment guidelines secondarily to support any impact found on beneficial use. We agree that variable or poorly defined guidelines should be used with caution and that these values should be based on the RWQCB understanding of the conditions in their Regions.	No	Policy, definition
23.10	SWRCB must continue to solicit input from industry in order to achieve an effective watershed management approach to restore beneficial uses to the State's water bodies.	The SWRCB will continue to solicit input from industry; Federal, State and local agencies; environmental groups; and the public in the development of the BPTCP activities.	No	Policy, prevention
24.1	One of the conditions that would classify a site as a toxic hot spot would be the exceedance of sediment quality objectives. The SWRCB has authority and a mandate to develop Sediment Quality objectives for toxic pollutants, yet none exist.	Comment acknowledged. Please refer to response to comment 5.9.	No	Policy, definition
24.2	ERLs and ERMs were never intended to be used as regulatory criteria, and should not be used as such.	These sediment guidelines are not being used as "regulatory criteria" (in the sense of water or sediment quality objectives). The values are being used to support information that directly measures impacts on beneficial uses. Please refer to the response for Comment 5.9.	No	Policy, definition
24.3	Due to fish mobility, it is not appropriate to designate an entire water body a toxic hot spot based on fish tissue contaminant levels alone.	Please refer to the response for Comment 3.1.	No	Policy, definition
24.4	Evidence suggests that low-level, widespread contamination, rather than hot spots, are contributing to bioaccumulation of contaminants in fish. Remediation of the toxic hot spot may not reduce	Using a watershed management approach where point and nonpoint sources of contamination are included, may address these kinds of problems and	No	Policy, definition, prevention

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	bioaccumulation in fish tissues.	may reduce the bioaccumulation of contaminants in fish tissue.		
24.5	Use dissolved metal concentration to measure metals concentrations. Do not use total metal concentrations in marine sediments, since they are not biologically available.	Please refer to the response for Comment 13.2, 13.7 and 13.13.	No	Policy, definition
24.6	The use of benthic community analyses in water bodies such as San Francisco Bay is not relevant.	This may be true. The RWQCB should make this determination based on the information available and the quality of that information.	No	Policy, definition
24.7	The Policy does not analyze the potential presence of hot spots outside areas that have BPTCP data. This may lead to piece-meal remediation with little long-term benefit.	Toxic hot spots cannot be identified unless there is good information to do so. It is not possible to analyze sites that do not have the appropriate types of data.	No	Policy, definition
24.8	Do not use pollutant source as a ranking criterion. Toxic hot spots should be prioritized based on threat to human health or the environment, not on whether a funding source exists.	Please refer to response for Comment 3.2.	Yes	Policy, ranking criteria
24.9	Regional policy in San Francisco Bay and state Policy are inconsistent with regard to in-place capping of sediments. BCDC opposes in-place capping.	Please refer to the response for Comment 12.39.	No	Policy, remediation alternatives
24.10	Upland disposal of dredge material contributes to air quality impacts. This impact must be evaluated under CEQA, even in an FED.	Please refer to the response for Comment 30.29 and 30.30.	No	Policy, Environ-mental impacts
24.11	There needs to be a mechanism for delisting sites.	Please refer to the response for Comment 3.6.	Yes	
24.12	Remediating hot spots is beneficial to improving the health of localized areas, but this does not address the problem of low-level contaminants in the entire ecosystem. Many of the toxic hot spots are historic, naturally capped and are therefore no longer a significant source to the biota.	Comment acknowledged.	No	Policy, definition
25.1	The draft Policy reveals an approach which strikes a balance between the SWRCB and the RWQCB responsibilities. The proposed guidance policy provides the framework for implementation of the	No response is required.	No	

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	BPTCP consistently across California, while allowing each RWQCB flexibility to meet it's unique regional needs.			
25.2	Insert the word "California" before Department of Health Services to distinguish between the state and local agencies.	This clarification is not needed, all State agency names would have to have this designation if this change is made. The change does not appear to add clarification to the proposed Policy.	No	Policy, page xix
25.3	RWQCBs should consider all available data when developing the toxic hot spot list.	The RWQCBs will consider all information that can be used for the purposes of identifying and ranking toxic hot spots.	No	Policy, mandatory requirement
25.4	Once a site is listed as a toxic hot spot, what is the mechanism for re-evaluation? How often? Will the toxic hot spot criteria for listing be changed?	Please refer to the response for Comment 12.48.	Yes	
25.5	If a toxic hot spot is identified as having contaminants from urban runoff, will the county wide municipal NPDES permit be modified for that specific site, water body, specific watershed, or the total county?	These are the types of decisions that will need to be made by the RWQCBs in developing the regional toxic hot spot cleanup plan. Guidance on these issues are not appropriate for statewide guidance.	No	Policy, prevention
25.6	The Port District supports the philosophy of pollution prevention to help protect water quality.	Comment acknowledged.	No	Policy, prevention
25.7	This Policy may not have met CEQA requirements, since growth-inducing impacts were not properly addressed.	Please refer to the response for Comment 30.29 and 30.30.	No	FED, page 117
26.1	We support the need to protect water quality and appreciate the opportunity to comment.	Comment acknowledged.	No	
26.2	The guidance does not include the legislative definition of toxic hot spot. The definition should at least be referenced.	The FED contains several references and quotations of the Water Code definition of a toxic hot spot (Section 13391.5(e)). The definition should not be repeated in the Policy because that would violate the Administrative Procedure Act requirements related to nonduplication.	No	Policy, page xviii
26.3	The guidance and policy place too much emphasis on revising waste discharge requirements or NPDES permits as the strategy for cleaning up toxic hot spots.	Please refer to the response for Comment 28.1.	Yes	Policy, page xliii

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26.4	Only use properly adopted, scientifically-based water quality, fish tissue, wildlife, and sediment quality criteria as a basis for designating toxic hot spots.	This suggestion would not satisfy the definition of a toxic hot spot in the Water Code (Section 13391.5(e)). Water and sediment quality objectives are only one of the considerations. Please refer to the response for Comment 13.2, 13.3, 13.7, and 13.13.	No	Policy, page xviii – xxi
26.5	Restoring toxic hot spots to an unpolluted condition should be removed as this is an impossible and immeasurable standard to meet.	Please refer to the response for Comment 30.23.	Yes	Policy, page xvii
26.6	Pollutant sources should not be used as a ranking criteria.	Please refer to the response for Comment 3.2.	Yes	Policy, page xxii
26.7	One of the alternatives states that US EPA 304(a) criteria be used as aquatic life numbers. These should not be recommended for use in California as water quality objectives must go through the proper Porter-Cologne analysis before being used as an indicator of impairment.	Alternative 3 suggest the use of Section 304(a) criteria to help determine the significance of water column data that may be available to the RWQCBs. These values can be used for this purpose, they are not being used as water quality objectives.	No	FED, Issue 3
26.8	Remove the sentence that states "Stricter effluent limits can help remediate and prevent recurrence of toxic hot spots." This is only if the discharger whose permit is made more stringent is a substantial contributor to a toxic hot spot.	The statement in the FED is true in some cases even if the discharger is a minor contributor to the toxic hot spot. Please refer to the response for Comment 7.8.	Yes	FED, page 99
26.9	The SWRCB should consider the total costs, including remediation costs, and increased costs to permit holders and the environmental benefit that results from incurring these costs.	This will be done when the consolidated toxic hot spot cleanup plan is developed. Please refer to the response for Comment 12.3.	Yes	Policy, cleanup costs
26.10	The statement on effects to water utility and service systems, should be modified to include effects on wastewater treatment systems.	Agree. The statement will be modified.	Yes.	FED, page 127, endnote XII c, d, e, g
26.11	Further comments could be made regarding the potential impact to the commenters wastewater treatment plant budget, however, additional comments will not be included.	Comment acknowledged.	No	
27.1	We have been impressed by the efforts of your staff to develop a solution to the problem of locally	No response is necessary.	No	

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	concentrated toxic pollution which is scientifically sound, practical, and equitable.			
27.2	This document meets CEQA requirements for use as a "program" environmental document, and we suggest no amendments to the proposed language so long as the document is used for this purpose only.	No response is necessary.	No	FED, environ-mental impacts
27.3	Additional, more detailed, environmental review should be performed, on a site specific basis, as part of preparation of the individual cleanup plans for each particular toxic hot spot.	Comment acknowledged.	No	FED, environ-mental impacts
27.4	"Weight of evidence" approach for identifying hot spots is strongly supported by the City.	Comment acknowledged.	No	FED, definition
27.4a	Basing hot spot designations on demonstrated adverse biologic effects to species and not on arbitrary levels of contaminants in sediment or water is also supported by the City.	Comment acknowledged.	No	FED, definition
27.4b	The city supports the requirement that explicit consideration of "natural remediation" be included in the preparation of site specific cleanup plans for designated toxic hot spots.	Comment acknowledged.	No	FED, remediation alternatives
27.5	The city does not support the proposed designation of the entire San Francisco Bay as a toxic hot spot. This seems contrary to the Water Code.	Please refer to the response for Comment 3.1.	No	FED, definition
27.6	Using a health advisory to identify toxic hot spots seems to identify regional water quality problems and not local concentrated contamination that the BPTCP is intended to address. Designation of the whole San Francisco Bay as a toxic hot spot results in a defacto water quality standard.	The BPTCP is intended to identify toxic hot spots. To our knowledge the Water Code does not focus the identification on localized areas. Please refer to the response for Comment 3.1 and 12.8 (related to water quality objectives).	No	FED, definition
28.1	It is unclear how the proposed Policy will accomplish any meaningful enhancement on water quality if the focus continues to be existing discharge permits.	Agree. The prevention section of the proposed Policy should be broadened to include potential sources of pollution that have not been issued WDRs.	Yes	Policy, Page xliii
28.2	Has the SWRCB consulted with relevant government agencies consistent with Water Code Section 13144?	The SWRCB has distributed the proposed Policy widely for comment. We have received comments from Federal, State and local agencies. Additionally, the SWRCB has also consulted with other State	No	

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		agencies through the State Clearinghouse. During the development of many of the proposals in the FED, the SWRCB consulted with OEHHA, DPR, DHS and DFG.		
28.3	How will the SWRCB meet the requirements for peer review?	In compliance with Health and Safety Code Section 57004, the SWRCB has conducted an independent peer review of the FED. Scientists at the University of California have reviewed the FED.	No	
28.4	The proposed Policy could mislead the public into believing that the RWQCBs are able to evaluate years of planning, study, analysis, monitoring, review inherent with technical and policy wisdom not available to other agencies, and provide remediation plans. The proposed Policy should provide for a phased approach to address such issues in a logical manner.	It is possible that the public is confused by the proposed Policy. As long as the proposed Policy sets out flexible approaches and consistent guidelines, the RWQCBs will be able to develop legally and scientifically defensible cleanup plans that can be implemented. The FED does establish a phased approach to developing the cleanup plans.	No	
28.5	What are the relationships between all the cleanup activities in the Regions relative to the BPTCP planning efforts? What justifies omission of some sites? How do other State and Federal program cleanup actions relate?	The cleanup plans are a way for the RWQCBs to organize their efforts to remediate the worst sites in enclosed bays, estuaries and the ocean. The cleanup plans are intended to bring together regional efforts, not serve as a new, independent planning effort. Sites that do not meet the specific definition of a toxic hot spot are omitted.	No	
28.6	Policy, Page xvii, Section D. In developing a list of preliminary actions, are the RWQCBs to rely upon their own experience or upon the development of data equivalent to a Remedial Investigation/ Feasibility Study?	The RWQCBs need to rely on their own experiences and their knowledge and understanding of problem sites. The BPTCP planning efforts are not exactly the same as other State and Federal efforts. Perhaps the RWQCBs will be able to use information from different programs to develop cleanup plans such as those discussed in the comment.	No	Policy, page xvii, Section D
28.7	The FED and proposed Policy make reference to the need for evidence. Are these references to circumstantial evidence, direct evidence, preponderance of the evidence? Should not the proposed Policy give instructions on what the burden of proof requirement will be?	The proposed Policy establishes a definition of a toxic hot spot that can be used consistently throughout enclosed bays and estuaries. The RWQCBs are required to make sure the conditions for a toxic hot spot are present before a site is classified as a candidate toxic hot spot. Where	No	

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		flexibility is provided (e.g., toxicity assessments and chemical concentration interpretation), the RWQCBs are afforded discretion. The proposed Policy provides the SWRCB's views on the burden of proof necessary to identify toxic hot spots.		
28.8	With respect to reevaluation of WDRs, if dischargers are not identified can an already identified discharger take action to include others? How will reevaluations be scheduled? Will reevaluation trigger EPA Region 9 review? Will general permits be examined?	Please refer to the response for Comment 12.48. It is premature to discuss these issues before the RWQCBs have developed their final toxic hot spot cleanup plans. These topics should be discussed at the RWQCB hearings on the proposed cleanup plans and when the SWRCB considers the consolidated plan. A new section has been added the proposed Policy for issues to be considered by the SWRCB in development of the consolidated plan.	Yes	Policy, prevention
28.9	What are the relationships to the National Toxics Rule, Implementation Policy, 303(d)/TMDL efforts, watershed protection planning, 319 and 205(j) planning, and consistency in remediation alternatives and costs?	The National Toxics Rule will (if approved) ultimately provide water quality criteria that could be used in identifying toxic hot spots. The implementation Policy will be an important Policy when the RWQCBs begin the process of implementing Section 13395 (after the consolidated plan is approved) because it will provide guidance on developing WDR limitations. Watershed planning, 319, and 205(j) are important mechanisms to provide funding and planning for addressing nonpoint sources, identifying sources and implementing some forms of corrective actions. Remediation alternatives and costs will necessarily be region- and, in most cases, site-specific. In all cases, it is the intent that the RWQCBs consider a wide range of alternatives for addressing problems.	No	FED, prevention
28.10	A 30 day time extension on the close of the record is requested to allow much of the regulated community to focus on the issues and provide the needed input to improve the proposed Policy.	The hearing record was extended from May 11, 1998 to May 15, 1998.	No	
28.11	Data has been used in a positive way to formulate planning, identification and consideration of other	Comments acknowledged.	No	

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	SWRCB programs has been considered to some extent, creative and effective use of CEQA is proposed in concept, current known technologies for addressing sediment pollution are drawn together effectively, and the FED is logically organized.			
28.12	Listing an entire water body will not solve water quality problems and will assure they will never be solved.	Please refer to the response for Comment 3.1.	No	Policy, definition
28.13	Policy, Page xxi, Ranking Criteria. Is the "value of the water body" the same as described in the Clean Water Strategy or the 303(d) listings?	It is not the same as described in the Clean Water Strategy or in the 303(d) process. The guidance given is meant for the RWQCB to use the ranking criteria provided but if there are additional considerations about special water bodies or portions of water bodies, those considerations should be factored into the decision. It is impossible to incorporate those factors on a Statewide level into the proposed Policy because they are water body-specific.	No	Policy, ranking criteria
28.14	Related to the water quality objectives ranking criterion, it seems that data 10 years old may be too old for purposes of ranking.	Please refer to the response to Comment 12.27.	No	Policy, ranking criteria
28.15	Related to the water quality objectives ranking criterion, the terms "regularly", "occasionally" and "infrequently" should be defined.	This criterion is more clearly defined in Alternative 3; however, this criterion is very dependent on the data available to the RWQCBs. The frequency of the exceeded water quality objective should be left up to the RWQCB so a fair determination with site-specific information can be made. Please refer to the response for Comment 5.15.	No	Policy, ranking criteria
28.16	The rationale for using an areal extent criterion for ranking seems backward.	The RWQCBs are not required to make a "high" or "moderate" determination for the areal extent ranking criterion. The RWQCB may therefore discount smaller sites or increase their priority based on RWQCB priorities. The reason for the criterion is that an estimate of the areal extent of the toxic hot	No	Policy, ranking criterion

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		spot should be included in the ranking process and regional priority should be established by the RWQCBs.		
28.17	"Pollutant source" and "source" should be defined. The definition should include more than dischargers who hold WDRs.	Please refer to the response for Comment 28.1. Pollution source is being dropped as a ranking criterion. "Source" is a discharger of pollutants.	Yes	Policy, ranking criteria
28.18	The proposed ranking criteria should allow for more than a summary description of the ongoing regulatory efforts.	The appropriate place for a description of the ongoing regulatory efforts is in the "summary of actions by the regional board" section required by Water Code Section 13396(h).	No	Policy, ranking criteria
28.19	The ranking criteria should include a value for the interrelationships of existing programs giving priority to sites with the framework for watershed management.	This suffers from the same problems as the pollutant source criterion and therefore should not be used.	No	Policy, ranking criteria
29.1	The use of criterion #3, the issuance of a health advisory against fish consumption, to automatically designate a site as a toxic hot spot, results in a designation that is overly broad and in effect, meaningless.	Please refer to the Response for Comment 3.1.	No	Policy, definition
29.2	The use of "pollutant source" as a criterion in the Ranking Process.	Please refer to the Response for Comment 3.2.	Yes	Policy, ranking criteria
29.3	Both government and private funds are limited and every effort should be made to avoid redundancy and duplication in prevention efforts under the BPTCP.	Comment acknowledged.	No	
30.1	The BPTCP should be developed as part of an integrated watershed management approach.	Comment acknowledged.	No	
30.2	The definition of a candidate toxic hot spot does not embody a weight-of-evidence approach focused on sediment pollution. The definition is overly broad.	The definition of a toxic hot spot addresses the mandates of the Water Code (Section 13391.5(e)) and gives guidance on the various conditions that need to be met to designate a candidate toxic hot spot. The definition addresses both water and sediment problems as well as aquatic life and human health protection (as required by law).	No	Policy, definition
30.3	Address water quality problems under other existing SWRCB programs.	If problems are being addressed by other programs the sites should not be exempted or removed from	No	Policy, prevention

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		the cleanup plans. The Water Code requires that the RWQCBs identify efforts to address the identified problems. The proposed Policy requires RWQCBs to identify actions underway and gives guidance on other factors that are needed in the prevention section of the Policy. Some water quality problems may not be addressed by existing programs, such as pesticides in the Sacramento River/San Joaquin River Delta.		
30.4	Use alternate mechanisms to address fish tissue problems. It is inappropriate to use health advisories and elevated tissue concentrations as indicators of impairment. Focus on sediments and benthic effects.	Please refer to the response for Comment 3.1 and 13.29.	No	Policy, definition
30.5	Redefine the candidate toxic hot spot definition to require that a site meet more than one of the conditions. The definition should also allow for delisting sites.	This alternative would make it more difficult for a site to be included on the candidate toxic hot spot list. It also seems to conflict with the statutory definition of a toxic hot spot because it requires more than one condition to be met to have a hot spot while the Water Code definition does not. Please refer to response for Comment 3.6 with respect to de-listing sites.	No (for change to definition) and Yes (for de-listing).	Policy, definition
30.6	Base the ranking criteria risks to human health and aquatic life and not on factors related to the ease or expense of cleanup.	This proposal would conflict with the direction given in Water Code Section 13393.5.	No	Policy, ranking criteria
30.7	Remove pollutant source from the ranking criteria.	Please refer to the response for Comment 3.2.	Yes	Policy, page xxii
30.8	Streamline ranking criteria by performing ranking in two steps: (1) base first ranking on environmental impacts, and (2) use weighted areal extent and remediation potential ranking criteria subsequently.	This alternative is virtually the same as the toxic hot spot identification and ranking provided in the FED. The apparent difference is that all environmental impacts have different unspecified weights. The advantages of using this approach are unclear and do not seem to streamline the process.	No	Policy, ranking criteria
30.9	Define toxic hot spots using categories like "significantly contaminated sediment sites" based on the number of listing criteria met.	This approach is very similar to the BPTCP Advisory Committee recommendations developed in October 1996. These categories work well if human health is not considered in the ranking. We are unaware of reference sites related to human health concerns. In	No	Policy, definition, ranking criteria

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		accordance with the Water Code, human health must be considered by the SWRCB and RWQCBs in identifying and ranking toxic hot spots.		
30.10	The proposed policy fails to address any non-sediment impairments, the associated cleanup methods and costs for remediation.	Non-sediment impairments are considered in the definition and ranking of sites. Methods and costs are not included in the Policy because water remediation methods are very site-specific and discharge-specific. The proposed Policy has been revised to present some considerations for assessing costs of remediation for water-related toxic hot spots. The FED has been revised to present water treatment technologies, expected effluent quality with different methods and estimated costs.	Yes.	Policy, xxiv+
30.11	Narrow the definition to address sediment pollution only.	The Water Code requires the identification of toxic hot spots in sediment and water (Section 13391.5(e)). The SWRCB would not be able to comply with the Water Code if the definition were focused exclusively on sediment pollution.	No	Policy, definition
30.12	Delete or move tables of methods to an appendix. Acknowledge that more detailed analyses are required to carry out the plans.	The tables seem to be more useful if in the text. The proposed Policy already acknowledges that more detailed assessments and analysis should be performed by responsible parties (please refer to Policy, page xvii, Section E).	No	Policy, remediation alternatives
30.13	The proposed Policy is too narrowly focused on point source dischargers. RWQCBs should be directed to develop site- and pollutant-specific strategies. Acknowledge improvement in POTW discharge quality.	Agreed. Please refer to the response for Comment 28.1.	Yes	Policy, page xliii
30.14	Before WDRs are reevaluated a source assessment should be completed.	This may be a likely outcome of the reevaluation but the decision to complete this study should be made on a region- and problem-specific basis. Please refer to the response for Comment 28.8.	No	Policy, prevention
30.15	Revise the wording of the prevention section to broaden focus to all contributing sources. Use language from October 1997 Guidance Document.	Please refer to the response for Comment 28.1.	Yes.	Policy, page xliii
30.16	Executive Director approval of variances is	This variance provision is provided so the RWQCBs	No	Policy,

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	superfluous. Allow RWQCB Executive Officer to approve variance.	can use an alternate approach not listed in the Policy. This provision is provided so the discussions on alternate approaches begin before the RWQCB hearings and so the approach can be incorporated into the SWRCB consolidated plan. Because the time is so short, it is essential that any changes be rolled into the cleanup plans early so the SWRCB can still meet the June 30, 1999 deadline. It does not make sense to delegate this responsibility to the RWQCB Executive Officer. Please refer to the response for Comment 13.8.		Introduction
30.17	The proposed Policy should be very specific on identifying present and historical loadings, how sources will be identified, and assigning responsibility.	This is a problem- and region-specific effort that should be completely delegated to the RWQCB because they know the conditions and discharges in their Regions the best. Any guidance the SWRCB might give may negatively influence source identification.	No	Policy, mandatory requirement
30.18	Sites being addressed by other agencies or programs should not be characterized as candidate toxic hot spots and should not be part of the regional cleanup plan.	Please refer to the response to Comment 7.11, 7.12, and 30.3.	No	Policy, prevention, mandatory requirement
30.19	Policy, Page xvii. It may be impossible to restore a toxic hot spot to an unpolluted condition.	Please refer to the response to Comment 30.23.	Yes	Policy, page xvii
30.20	A requirement for potential dischargers to prepare a proposal for site remediation is premature and should not be included in the regional cleanup plans.	We disagree. More detailed assessments of the problem, areal extent, and remediation options should be carried out by the responsible parties in order to implement the cleanup plans after the consolidated plan is complete.	No	Policy, remediation alternatives
30.21	Require a source assessment for toxic hot spots to include data supporting identification of potentially responsible parties.	Please refer to the response to Comment 30.17.	No	Policy, remediation alternatives
30.22	Create a separate category for sites being addressed by other agencies or programs. Action by another agency should be grounds for a site not being listed.	This recommendation seems contrary to the Water Code definition of a toxic hot spot (Section 13391.5(e)) and requirements for what should be included in the cleanup plans (Section 13394). If a site meets the requirements for	No	Policy, definition, remediation alternatives

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		the definitions it should be included on the candidate list.		
30.23	Consider alternatives for defining "how clean is clean."	Specific guidance on this issue may make it more difficult to address problem site remediation but general guidance seems appropriate. A section will be added to the proposed Policy to address this issue and "unpolluted condition" comments.	Yes	Policy, page xvii
30.24	Consider alternatives to requiring dischargers to prepare site remediation action proposals. Alternatively, consider amending Basin Plans to include these requirements.	Please refer to the response to Comment 30.20. These requirements could be put in Basin Plans at the discretion of the RWQCBs.	No	Policy, mandatory requirement
30.25	The process for adopting Policies and Cleanup plans are not certified as functionally equivalent to the CEQA process. If these plans are adopted under these provisions they are, in effect, Water Quality Control Plans. The SWRCB must apply for certification for the Cleanup Plan adoption.	We disagree. This process has been used successfully to adopt Policies. Granted the contents of cleanup plans differ from water quality control plans, but there is no reason for the process and considerations for their adoption to be different.	No	FED, policy adoption process
30.26	We strongly object to the RWQCBs adopting the regional cleanup plans without complying with CEQA.	The RWQCB cleanup plans do not require action until they are approved and implementation begins. Implementation may take the form of WDR amendments, cleanup and abatement orders, or other mechanisms which themselves will be the subject of CEQA compliance. To perform CEQA analyses at this time is duplicative and wasteful, since the implementation mechanisms are currently unknown.	No	FED, adoption process
30.27	A full environmental impact report is required for the consolidated cleanup plan because the process for developing cleanup plans has not been certified as being functionally equivalent to the CEQA process.	Please refer to the response to Comment 30.25.	No	FED, adoption process
30.28	More information should be provided on why the preferred alternatives were selected.	The FED provides ample information on why the preferred alternative was selected. Pages 102 through 117 provide a baseline description and for each issue: existing RWQCB practices, the proposed policy, differences between policy and existing practices, potential adverse effects, and potentially	No	FED, environ-mental impacts

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		significant adverse effects.		
30.29	The SWRCB has failed to analyze the potential adverse effects of the proposed Policy. The SWRCB is required to "generally assess the potential environmental impact[s]" of the Policy.	The FED provides ample information on baseline conditions and the affects the proposed Policy will have on those conditions. Pages 102 through 117 provide a baseline description and for each issue: existing RWQCB practices, the proposed policy, differences between policy and existing practices, potential adverse effects, and potentially significant adverse effects. Impacts of the regional plans and the subsequent consolidated cleanup plan will be addressed when they are developed and proposed for adoption.	No	FED, environ-mental impacts
30.30	The environmental checklist are inadequate and must be revised to include the possibly significant economic impacts on dischargers and the public and these considerations must take place at the earliest possible stage (i.e., at the RWQCB level).	Partially agree. The environmental checklist is appropriate for the adoption of the proposed Policy. We agree that the environmental considerations should take place at the earliest possible stage which begins when the final regional cleanup plans are developed. Also, please refer to the response to Comment 30.29.	No	FED, environ-mental checklist
31.1	The Policy, as a whole, represents a consistent and scientifically balanced approach in addressing the issues associated with THS.	Comment acknowledged.	No	Policy
31.2	Support the establishment of the terms "candidate" and "known" in the definition of THS.	No response is necessary.	No	Policy, definition
31.2a	Support the state's approach of assigning a "No Action" value to any criterion which has not supporting data.	No response is necessary.	No	Policy, ranking criteria
31.3	Supports the state's decision to preclude the use of data which is older than 10 years.	No response is necessary.	No	Policy, ranking criteria
31.3a	Supports the state's recognition of the importance in using data for assigning ranking criteria which was the result of "appropriate analytical methods and quality assurance."	No response is necessary.	No	Policy, ranking criteria

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31.4	Supports the state's recognition of the evolving and emerging nature of remediation techniques and technologies by not prescribing an approach in the Policy, but rather allowing the respective RWQCBs and/or responsible dischargers the flexibility to identify and develop the appropriate cleanup plans at the time.	No response is necessary.	No	Policy, remediation
31.4a	Supports the state's recognition that a variance mechanism for developing site-specific alternative cleanup approaches is an important element of the Policy.	No response is necessary.	No	Policy, Introduction
31.5	Supports the state's position that analyses of community composition or population of a site with respect to impacts associated with the presence of toxics can only occur after all other influencing factors are excluded.	No response is necessary.	No	Policy, definition
31.6	Supports the state's position that the various RWQCBs must complete their regional plans for considering what actions are necessary to address THS before initiating any enforcement actions or revising WDRs.	No response is necessary.	No	Policy, adoption process and definition
31.7	Page xiv, Item No. 5 - No overall ranking is given in the toxic hot spot tables. Provide a mechanism for prioritizing the list for an overall ranking of all the THS sites within a region.	Agree. A new column will be added to the list for the overall ranking of a site within the Region.	Yes.	Policy, page xxi and xlvi
31.8	Review the historic to present data from each potential discharger before listing them as a potential source likely to have discharged or deposited the pollutant(s) identified in the THS.	The RWQCBs will use their understanding of the discharges to sites and water bodies in order to make this assessment. The assessment will certainly be made with information available to the RWQCBs. It is not advisable to place specific guidance on what information a RWQCB should use specifically because the amount and kinds of information will vary significantly from site to site.	No	Policy, mandatory requirement
31.8a	The RWQCBs should consider the mobility of the toxicants, the effects of currents and natural events (such as upwelling) in the toxicants distribution, the	Please refer to the response for Comment 31.8.	No	Policy, mandatory requirement

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	presence of the pollutant in the discharge, the concentration, total amount potentially discharged, proximity of the discharger to the THS and likelihood for the discharge to reach the THS.			
31.8b	Liability for site cleanup must be apportioned according to the responsibility for the THS' existence. The state should consider appropriating money from the State General Fund for the purpose of establishing a cleanup fund for those sites where the responsible party(ies) is (are) unknown or cannot fully pay for cleanup.	This comment will be addressed when the SWRCB develops the consolidated toxic hot spot cleanup plan. It is premature to address this issue now as part of the proposed Policy. A new section will be added to the proposed Policy on issues that may be considered in the consolidated cleanup plan.	Yes	
31.9	High Priority needs to be clarified.(Page xv, Item 6)	Please refer to the Response for Comment 31.7.	Yes	Policy, page xv, Item 6
31.10	It is unreasonable and impractical to require a site to be restored to an "unpolluted" condition. (Page xvii, Item 6D)	Please refer to the Response for Comment 30.23.	Yes	Policy page xvii Item 6D
31.11	A candidate THS is being identified as one where any one of a list of conditions is met. This is Inconsistent with the "weight of evidence" philosophy.	Please refer to the Response for Comment 30.5.	No	Policy, definition
31.12	The State must move rapidly forward in the establishment of numeric sediment quality objectives.	No response is necessary.	No	
31.13	If estimates for a criterion are made, the basis for such a judgment must be clearly stated and documented by the RWQCB. (Page xxi, Ranking Criteria)	Agree. The RWQCBs should describe the reasons for ranking.	Yes	Policy, Page xxi
31.14	The terms "regularly", "occasionally", and "infrequently" are too subjective and need to be defined. (Page xxii, Water Quality Objectives)	Please refer to the Response for Comment 5.15.	No	Policy, ranking criteria
31.15	Confirmation of the identity or partial identity of a pollutant source should also be required as part of the ranking criteria. The criteria used in ranking the THS should not only consider the pollutant source but also the nature of the toxin for cleanup purposes.	Please refer to the Response for Comment 3.2.	Yes	Policy, ranking criteria

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	(Page xxii, Pollutant Source)			
31.16	The explanation of scoring in the areas of feasibility and effectiveness seem to be reversed. (Page xlii, Table 14)	These values are not reversed. Cf. NRC, 1997.	No	Policy, page xlii, Table 14
31.17	The wording within the Policy should remain flexible in the selection, use, and future use of alternative technology or alternative approaches which can also meet the goals and objectives of THS prevention. (Page xliii, Prevention of THS)	Agree. No change is necessary.	No	Policy, page xliii
31.18	Alternative approaches to developing a cleanup plan should not have to demonstrate that the approach will provide better protection. (Page xliv, Item No. 4)	This finding is necessary so the "no remediation" is used as a last resort. If it is the best option then beneficial uses will be protected at equal or better levels. This statement will be clarified to add "equal to or" to the statement.	Yes	Policy, Page xxxvii-xxxviii
31.19	The Policy does not provide a mechanism for delisting or reranking a THS. Such a mechanism needs to be incorporated.	Please refer to the Response for Comment 3.6.	Yes	
31.20	The regional THS plans should be required to include a reference section of all material used to support their decisions and a fact sheet which substantiates all their judgments.	Agree. The RWQCBs should provide the stated information. It will not only provide the necessary justifications but provide information of the potential environmental impacts of the proposed actions.	Yes	Policy, mandatory require-ments
32.1	The State Board must not allow the dischargers to determine program policies - especially on issues such as protecting public health. The SWRCB should use water quality objectives and health advisories in the definition of a toxic hot spot.	Please refer to the response for Comment 3.1 and 13.25.	No	Policy, definition
32.2	There is a need for consistency from region to region in toxic hot spot listing and ranking criteria. "P" values used in the determination of toxicity should be consistent from Region to Region.	Please refer to the response for Comment 6.3.	No	Policy, definition
32.3	The use of natural remediation potential, identification of pollutant source and the estimated areal extent of the hot spot should not be used as ranking criteria.	Please refer to the response for Comment 10.5.	No	Policy, ranking criteria

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32.4	The proposed pollution prevention policy is inadequate because it does not require specific actions, rather it "promotes", "encourages" and "considers" actions.	Please refer to the Response for Comment 3.5.	No	Policy, prevention
33.1	Supports the State Board's preferred definition of a toxic hot spot, designating "candidate" toxic hot spots and "known" toxic hot spots.	No response is necessary.	No	Policy, definition
33.2	Define the term "site" more clearly.	The RWQCBs should have flexibility in determining what they consider a site to be. The SWRCB could very clearly define "sites" but the definition might not be applicable or useable under the many circumstances and conditions found in the State's diverse enclosed bays and estuaries.	No	
33.3	State Board should outline what resources exist when a Regional Board does not follow the State Board policy mandates.	It appears all the RWQCBs have complied with the tenants of the specific definition of a toxic hot spot presented in the October 1997 guidance document. If RWQCBs do not comply with the Policy, once approved, the final cleanup plans could be remanded for revision.	No	
33.4	For those stations which received a single toxicity hit with elevated levels of toxic pollutants, the Regional Board should be required to go back and take another sample.	Comment acknowledged.	No	Policy, definition
33.5	There have been inconsistent sampling strategies and standards used in defining toxicity and chemistry exceedances [sic].	Please refer to the Response for Comment 6.3.	No	Policy, definition
33.6	Disagree with the State Board's recommended criteria for ranking hot spots. The ranking criteria should not be given equal weight.	Giving the ranking criteria weights is similar to Alternative 3. It does not appear that additional information will be gained by setting up more categories. The selected alternative allows the SWRCB to satisfy the Water Code requirements for the ranking criteria and provides the RWQCBs with a way to discriminate the worst sites.	No	Policy, ranking criteria
33.7	Criteria should not be given a "no action" or "zero" score when information does not currently exist.	If the information does not exist or is unavailable then the score should be that the site cannot be ranked for the criterion. There is no reason to give a	No	Policy, ranking criteria

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		site a ranking if information are not available.		
33.8	The Regional Board and its staff should not have the discretion to determine which sites should be prioritized for further action.	The Water Code says the RWQCBs should establish the ranks in the regional cleanup plans (Section 13394).	No	Policy, ranking criteria
33.9	Continuing to operate under current management strategies, as now recommended, is not enough. EHC requests that all identified pollutant sources at known toxic hot spots be required to conduct an independent pollution prevention audit.	This type of study should be made on a pollutant- and region-specific basis.	No	Policy, prevention
34.1	Fish consumption advisories should remain a criteria for listing sites as "candidate" toxic hot spots.	Please refer to the response for Comment 3.1.	No	Policy, definition
34.2	Stay focused on the legislative intent of the BPTCP and provide maximum protection for human health and the environment.	No response is necessary.	No	
35.1	BPTCP does not generally apply to currently registered pesticides because these pesticides do not contribute to toxic hot spots.	The BPTCP applies to enclosed bays, estuaries and the ocean. Pesticides can contribute to impacts on beneficial uses in water or sediments. Registered pesticides can be considered pollutants if these are concentrations in water or sediments and if they contribute to or cause the observed effects on organisms.	No	Policy, definition
35.1a	The term "have accumulated" (in Water Code Section 13391.5(e)) should be reserved to describe substances of which concentrations increased in water or sediment over time. A toxic hot spot is an area where these substances reside and are still continuously available to threaten beneficial uses.	"Accumulated" is not specifically defined in the Water Code. The dictionary definition of "accumulated is "amassed" or "piled up". No time frame is given in the Water Code for how long pollutants need to accumulate before being considered. The definition is for "hazardous substances" has been used to determine if a pollutant can be addressed by the BPTCP. "Hazardous substances" are defined in the Health and Safety Code Section 25281, in part, as: "All of the following liquid and solid substances: (A) Substances on the list prepared by the Director of	No	Policy, definition

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		Industrial Relations pursuant to Section 6382 of the Labor Code. (B) Hazardous substances, as defined in Section 25316." In Health and Safety Code Section 25316 "hazardous substances" are defined, in part, as: "Any element, compound, mixture, solution, or substance designated pursuant to Section 102 of the federal act (42 U.S.C. 9602) ." 40 CFR Section 302.4 contains a list of hazardous substances designated under Section 102. Many pesticides (including diazinon and chlorpyrifos) are included in the table of hazardous substances.		
35.1b	The definition of toxic hot spots may also exclude most pesticides from the BPTCP because pesticides do not qualify as hazardous substances.	Please refer to the response for Comment 35.1a.	No	Policy, definition
35.2	DPR believes that the BPTCP does not apply to pesticides because the SWRCB did not confer with DPR prior to the completion of this draft guidance policy.	The SWRCB staff have conferred with DPR at meetings held in November 1997 and December 1997. DPR and the SWRCB have conferred concerning the BPTCP monitoring activities (which are included in the Management Agency Agreement).	No	
35.3	There should be public review for candidate toxic hot spots. The public cannot differentiate between candidate and known toxic hot spots. Eliminate candidate toxic hot spot designation.	Candidate toxic hot spot designations will be reviewed at the RWQCBs in public meetings and adopted at RWQCB meetings. The difference between candidate and known toxic hot spot designations is that both the RWQCBs and the SWRCB have adopted the list. If only RWQCB has adopted the list the sites are still candidates. The candidate designation is needed to avoid starting the reevaluation of WDRs required by Water Code Section 13395.	No	Policy, definition
36.1	The review period is closed and none of the state agencies have comments.	No response is necessary.	No	
37.1	The guidance document should not be including	Comment acknowledged.	No	Policy,

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	products like diazinon in the Toxic Hot Spot Cleanup Plans or given "high" priorities for TMDL issues. Information on the degradation of diazinon is provided.			definition
38.1	Correct typographical error in first paragraph regarding "p" values.	Accept.	Yes	FED, definition
38.2	It is not appropriate to use the "S" statistic in all circumstances. Use an alternate "K" statistic when there is variation in time and space.	Accept. The text describing interpretation of toxicity data in the FED has been revised.	Yes	FED, definition
38.3	The paragraph was drawn from the early drafts of the San Francisco Bay reference site report. Use an alternate description of the considerations for establishing "p" values.	This is not accurate. The paragraph was drawn from the SPARC recommendations. The revised language that is proposed revises the SPARC recommendations to bring undefined terms such as "Optimal conditions" that clouds the ideas expressed rather than clarifies. Also the revised descriptions discusses setting the "p" values based on the overall pollution of a water body (higher "p" values for more polluted water bodies and lower "p" values for cleaner water bodies). From a policy perspective, the evaluation may be the opposite: if the water body is very polluted then "p" values may be set low to reduce the number of sites that are identified as toxic hot spots so the existing regulatory framework is not overloaded. In any case, it is a Region-specific decision on sites depending on Regional priorities.	No	FED, definition
38.4	In the absence of a reference envelope, the toxicity evaluation point should be (1) t-test between laboratory control and organism response, and (2) organism response is lower than 90th percentile of the minimum significant difference for each specific test organism. The proposed Policy as written is not accurate in this respect.	Agree this change should be made. Statistical significance in t-tests should be determined by dividing an expression of the difference between sample and control by an expression of the variance among replicates. We should have used a "separate variance" t-test that adjusted the degrees of freedom to account for variance heterogeneity among samples. If the difference between sample and control is large relative to the variance among replicates, then the difference is determined to be significant. In many cases, however, low between-	Yes	Policy, page xviii-xviv

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		replicate variance will cause a comparison to be considered significant, even though the magnitude of the difference can be small. The magnitude of difference that can be identified as significant is termed the Minimum Significant Difference (MSD), which is dependent on the selected alpha level, the level of between-replicate variation, and the number of replicates specific to the experiment.		
39.1	We believe that pesticides that do not "accumulate in the water or sediment", including chlorpyrifos, a common active ingredient used for insect control, should not be characterized as responsible for Toxic Hot Spots or included in Regional Hot Spot Cleanup Plans.	Please refer to the response for Comment 35.1a.	No	Policy, definition
39.1a	The policy should reflect the concern with accumulations of pollutants and not transient exposures in the water column.	Please refer to the response for Comment 35.1a.	No	Policy, definition
39.2	We are concerned that insufficient attention has been paid in the proposed Guidance to the unique approaches appropriate for analysis and management of the potential water quality impacts of pesticides. Adoption of the proposed Policy will compromise the integrity of the PMP and MAA by creating a unnecessarily redundant and inappropriate program.	Appropriate attention has been placed to identify impacts on beneficial uses and the pollutants that contribute to or cause the impacts. The integrity of the MAA implementation is not compromised; it appears to be enhanced by using the data from a monitoring program listed in the MAA to address pollutants. Also, please refer to the response for Comment 14.3.	No	Policy, definition
39.2a	Existing programs, specifically the PMP, which implements MAA between the SWRCB and DPR, provide appropriate mechanisms to manage water quality concerns related to pesticides.	Please refer to the response for 14.3.	No	FED, prevention
39.2b	Adoption of the Guidance as proposed will compromise the effectiveness of the PMP and integrity of the MAA by creating an unnecessarily redundant and inappropriate program.	Please refer to the response for Comment 39.2.	No	
39.3	Guidance for programs to address pesticides and surface water quality should recognize the unique nature of the extensive scientific information that	The BPTCP monitoring activities are based on measures of effect (e.g., measures from toxicity tests). The procedures and measurements used in the	No	

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	supports their registration and the program should utilize this information to make more refined, science-based decisions about their status in the environment. We recommend that assessments should be based on risk of an adverse effect, not hazard.	BPTCP have been peer reviewed (SPARC, 1997). With the definition of the toxic hot spot, the RWQCB are granted flexibility in determining what exposures are appropriate. For example, in Region 5 the RWQCB has used toxicity tests coupled with toxicity identification evaluations to carefully decide if there is reason to believe if effects on organisms are related to relatively short toxic pollutant exposure. The approaches used by the BPTCP are scientifically defensible and are consistent with the Water Code.		
39.4	Only persistent chemicals or those that are continuously discharged are considered with the definition of a toxic hot spot.	This is not true. Please refer to the response for Comment 35.1a.	No	FED, page 6
39.5	The ranking criteria should consider only impacts on vertebrates.	"Toxic hazards to fish, shellfish and wildlife" can refer to vertebrates and any other type of organism (and life stage). There is not precise limits placed on what type of organisms or life stages can be used for ranking purposes.	No	FED, page 7
39.6	Emphasizes that weight of evidence involving multiple trophic levels in an ecosystem best characterize an environment of interest. The staff's proposal is far simpler than suggested in the 1991 workshop.	The approaches discussed at the workshop and the approaches presented to SPARC (SPARC, 1997), embody a weight-of-evidence approach that is scientifically defensible and meets the requirements of the Water Code.	No	FED pages 26-27
39.7	These higher priority criteria in Table 2 are not consistently implemented in the policy recommended by staff.	The approaches used by the BPTCP to identify toxic hot spots addresses many of the criteria recommended for a sediment quality assessment strategy. No approach completely addresses all the criteria, the approach that we ultimately used satisfies most of the criteria.	No	FED page 28
39.8	The best available scientific information requires both hazard and exposure characterization of sufficient detail to predict actual area of impacted aquatic habitat and the temporal pattern of these impacts.	Chemistry measurements, toxicity test results and community impacts are separate lines of evidence that assist he RWQCB in making assessments of whether sites are impacted. Site ranking is based on the information available.	No	FED, page 45
39.9	The full scope of impact should be determined prior to committing resources to cleanup.	Comment acknowledged. Ranking is the first step in developing cleanup plans. It is anticipated that sites	No	FED, page 46

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		will be more fully characterized during the implementation of the cleanup plan.		
39.10	Transient toxic effects on populations in localized areas typically are mitigated by recolonization from unaffected surrounding areas, especially in the water column of flowing systems.	Comment acknowledged. Complete loss of beneficial use is not necessary to demonstrate that beneficial uses are impacted.	No	FED, page 47
39.11, 39.12	Ranking Criteria: Alternative 3 appears to represent better science than the simpler Alternative 4.	Comment acknowledged.	No	FED, pages 50-51
39.13	The terms "regularly", "occasionally", and "infrequently" suggest that the intent is to define the probability of exposure and imply that a risk-based assessment should be carried out. We support the use of probabilistic risk assessment methods to achieve this goal.	Please refer to the response for Comment 5.15.	No	FED, page 59
39.14	The agricultural industry and those who benefit from urban pest control have a critical stake in the development of the toxic hot spots' process and policy. The policy will have profound adverse impacts on agriculture and urban environments that depend on pest control.	Please refer to the response for Comment 30.29 and 30.30.	No	Environ-mental Checklist, I.d
39.15	We believe there are effective means through existing programs to reduce the offsite movement of pesticides in both the agricultural and urban environment.	Comment acknowledged.	No	
39.16	We do not believe the proposed Guidance should allow the identification of pesticides that do not accumulate, but may be present in transient, episodic events to be interpreted as causal of Toxic Hot Spots, and incorporated into Regional Board Cleanup Plans.	Please refer to the response for Comment 35.1a.	No	Policy, definition
39.17	We believe existing programs implementing the MAA between DPR and the Board provide appropriate, effective mechanisms to address pesticide concerns in surface water.	Please refer to the response for Comment 14.3.	No	Policy and FED, prevention
40.1	It is inappropriate to include pesticides that are currently being used and do not "accumulate" in a program that focuses on persistent materials.	Please refer to the response for Comment 35.1a.	No	Policy, definition

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40.2	An example of a episodic nature of a pesticide is provided to show that the pollutant is not "accumulated".	Comment acknowledged.	No	Policy, definition
41.1	Support and incorporate by reference the comments made on behalf of Tri-TAC and the California Association of Sanitation Agencies.	Those responses to the Tri-TAC/CASA comments are listed under Commenter 30 (above).	No	
41.2	The definition of "candidate toxic hot spot" contained in the Guidance will cause nearly every water body in the State with data available to be identified as a toxic hot spot. More than one criterion in the existing definition should be used to identify hot spots.	The first statement is not correct. Sixty-three sites were identified as candidate toxic hot spots using the definition in the proposed Policy. This does not comprise all water bodies with data available. Please refer to the response for Comment 30.5 for response to the "multiple indicator" comment.	No	Policy, definition
41.3	The Guidance's proposed identification and characterization processes could result in a circumvention of the California Water Code. (Sections 13000, 13241). The guidance proposes adoption of a "standard".	The proposed Policy does not circumvent the Water Code. Standards are contained in WDR and NPDES permits. Standards are not a part of the proposed Policy.	No	Policy, definition
41.4	Knowledge of "Pollutant Source" should not be a ranking criterion.	Please refer to the response for Comment 3.2.	Yes	Policy, ranking criteria
41.5	Ranking should not be based on exceedances of "criteria".	Please refer to the Response for Comment 12.14.	No	Policy, ranking criteria
41.6	The cleanup plans should be strongly grounded in science and should seriously assess whether and to what extent cleanup of the sites could reasonably be achieved through the coordinated control of all factors which affect the water or sediment quality.	Comment acknowledged.	No	
41.7	The SWRCB should give guidance to the RWQCBs on the appropriate manner for amending WDRs related to cleanup plans.	Please refer to the Response for Comment 12.48.	No	Policy, prevention
41.8	The FED should consider the potential costs associated with implementation of pollution prevention/source control.	This is a site- and problem-specific consideration and should be considered by the RWQCBs, if possible, in developing the regional cleanup plans.	No	FED, environ-mental impacts

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41.9	The potential adverse environmental effects of a sediment remediation plan resuspension of contaminants, relocation and disposal of contaminated sediments must be considered at the earliest possible point.	Please refer to the response for Comment 30.29 and 30.30.	No	FED, environ-mental effects
41.10	Cleanup plans and revisions will affect government services, sewage treatment facilities and storm drainage.	Please refer to the response for Comment 30.29.	No	FED, environ-mental effects
41.12	The FED's analysis is far too cursory and narrow	Please refer to the response for Comment 30.29.	No	FED, environ-mental effects
41.13	We would like to encourage the SWRCB to restructure these documents to avoid duplication with existing programs to the maximum extent possible.	Restructuring is not necessary to avoid duplication.	No	
42.1	The Definition of a Toxic Hot Spot should embody a weight of evidence approach.	The definition does embody a weight-of-evidence approach. Please refer to the Response for Comment 30.5. Both aquatic life impacts and potential impacts on human health are considered in the definition consistent with the Water Code.	No	Policy, definition
42.2	Do not recommend using the current Criteria for ranking. Use criteria developed by the BPTCP Advisory Committee.	Please refer to the Response for Comment 30.9.	No	Policy, ranking criteria
42.3	The appropriate remediation strategy should be directed towards non-point source pollution prevention and watershed management approaches and not expensive sediment methods.	The types of remediation that will be identified by the RWQCBs should specifically address the problem identified. It makes no sense to cleanup sediments if the problem can be addressed by watershed management or other pollution prevention activities. All of the approaches discussed are available to the RWQCBs and should be selected for consideration as needed.	No	Policy, prevention
42.4	The BPTCP should be streamlined and coordinated with other state and federal programs with similar objectives and authorities. Sites covered by other programs should not be listed.	Please refer to the responses for Comments 7.11, 7.12, and 30.3.	No.	Policy, mandatory requirement prevention

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43.1	The SWRCB/DPR MAA and the PMP have been overlooked.	The FED should acknowledge the MAA and the PMP. The FED has been revised to describe the PMP and MAA.	Yes	FED, prevention
43.2	Consider redundant programs. RWQCBs are crossing over into the NPS management plan and PMP.	The regional cleanup plans are not redundant but rather are another mechanism for addressing water or sediment quality problems. Please refer to the response for Comment 14.3.	No	Policy, prevention
43.3	The proposed Policy will have a major impact on key agricultural growing areas and urban areas where pesticides are used.	Comment acknowledged.	No	
43.4	Listing of pollutants should be consistent statewide.	The RWQCBs are required to list the pollutants that are suspected of causing the toxic hot spot. Considerable discretion is afford the RWQCBs in their descriptions of pollutants. It is agreed that a chemical should not be listed unless there is information available to substantiate the finding. We know of no cases in the proposed regional toxic hot spot cleanup plans were pollutant listings were not made with knowledge of the suspected pollutants.	No	Policy, mandatory requirement
43.5	Extend the comment period by 30 days.	The comment period was extended from May 11, 1998 to May 15, 1998.		
44.1	As discussed in the hearing, there are significant deficiencies with the SWRCB staff's approach for designating and ranking toxic hot spots.	Comment acknowledged.	No	Policy, definition, ranking criteria
44.2	The Board is going to be provided with significantly unreliable information by it s staff on the validity of it's proposed approaches for designating and ranking toxic hot spots.	Please refer to the response for Comment 13.2, 13.4, 13.5, 13.7, and 13.13.	No	Policy, definition, ranking criteria
44.3	If the SWRCB staff disagrees with any of the material I have submitted, I would like the opportunity to enter into a full public, peer review discussion of issues where an independent, unbiased panel of experts could review the issues and advise the SWRCB.	Comment acknowledged.	No	

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44.4	The peer review should be one in which no party has the ability to control the results of the review where it is based on the best possible technical information available to develop guidance to the Board on issues and there is an opportunity for those concerned about a particular issue to interact with the peer reviewers.	Please refer to the response for Comment 13.6 and 13.24.	No	
44.5	The focus of this program should be on controlling aquatic life toxicity and excessive bioaccumulation of hazardous chemicals in edible aquatic organisms that cause the organism to be a threat to be used as human food.	Comment acknowledged.	No	Policy, definition
44.6	Strongly support a non-numeric, best professional judgment, weight-of-evidence approach involving aquatic organism assemblage information, aquatic life toxicity/excessive bioaccumulation information and appropriate chemical information to designate and rank toxic hot spots.	Please refer to the response for Comment 13.2, 13.7 and 13.13.	No	Policy, definition
44.7	The primary problem with the proposed policy is that the State Board staff have persisted with an obviously technically invalid approach of attempting to incorporate chemical information into the sediment quality triad weight-of-evidence approach which does not properly define the relationship between the presence of a chemical constituent in sediments and/or water and the impact on the beneficial uses of a waterbody.	Please refer to the response for Comment 13.2, 13.4, 13.5, 13.7 and 13.13.	No	Policy, definition
44.8	There is no need to use the technically invalid approaches for designating and ranking toxic hot spots proposed by the staff. Use real use impairments.	Please refer to the response for Comment 13.2.	No	Policy, ranking criteria
44.8a	The chemical component of a sediment quality triad should be based on a proper evaluation of the relationship between the presence of a chemical constituent and the adverse impact, i.e. cause of toxicity, source of constituents that bioaccumulate to excessive levels, etc.	Please refer to the response for Comment 13.7.	No	Policy, definition

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44.9	The toxic hot spot definition and ranking criteria are unreliable. I have recommended that the SWRCB adopt a Policy that provides the opportunity to appoint an independent, non-State-Board-staff-controlled expert panel representing various stakeholders to develop appropriate toxic hot spot designation and ranking procedures.	Please refer to the response for Comment 13.6 and 13.24.	No	Policy, definition, ranking criteria
44.10	The State board staff's approach which is based on an association/co-occurrence approach is obviously technically invalid for determining the cause of toxicity and/or the source of the toxic components - bioaccumulatable chemicals of concern in designating and ranking toxic hot spots.	Please refer to the response for Comment 13.7.	No	Policy, definition
44.11	The co-occurrence-based approaches that the State board staff have advocated are obviously technically invalid. The methods are contrived. These chemicals do not cause the observed effects.	Please refer to the response for Comment 13.2 and 13.7.	No	Policy, definition
44.12	Ammonia and hydrogen sulfide are by far the most important cause of sediment toxicity. Co-occurrence values are not a valid basis for establishing a regulatory program in which public entities could become trapped into becoming responsible parties.	Please refer to the response for Comment 12.18.	No	Policy, definition
44.13	A stormwater quality management conference organized by the University of Southern California agree with the approaches advocated by the commenter (e.g., forensic TIE approaches).	Comment acknowledged.	No	Policy, definition
44.14	An environmental group says more hot spots should be identified related to stormwater discharges. This is the type of situation that can develop from inappropriate use of chemical information.	Comment acknowledged.	No	
44.15	Co-occurrence-based values are "junk" science.	Comment acknowledged.	No	Policy, definition
44.16	It is dangerous to assert that elevated concentrations of constituents in sediments are causes of toxicity or bioaccumulation.	Agree. The FED does not say that the sediment values represent levels that cause sediment toxicity. The values have been used to show associations between observed toxicity (beneficial use impact)	No	Policy, definition

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		and chemical concentrations that could contribute to the observed impacts.		
45.1	The SWRCB and RWQCBs have obviously put in considerable amount of effort including the use of expert panels (SPARC) and are to be congratulated on their output. In particular, the detailed notes from the committee meetings allowed me to understand their thinking and make an informed peer review.	Comment acknowledged.	No	
45.2	Given adequate reference and control data, field biology assessment (including benthic community structure) should clearly dominate toxic hot spot rankings.	Agree. Field biology should receive higher rankings by the RWQCBs relative to the other measures. The ranking criterion for aquatic life has been changed to reflect this comment. Benthic community impacts alone are not sufficient to identify a toxic hot spot.	Yes	Policy, ranking criteria.
45.3	The use of the "reference envelope" is not yet appropriate. Small differences may not be detectable. Encourage the publication of this concept as soon as possible in the open peer-reviewed literature.	With the reference envelope we are looking for very large differences between reference conditions and impacted sites. We agree that small differences are not as important in the BPTCP because we are looking for the worst of the worst sites. A publication on the reference envelope as being used in the BPTCP is being prepared. The proposed Policy says to use the reference envelope approach but does not say specifically how to calculate it. If the method changes those changes can be used. The policy provides a mechanism for evaluating toxicity data in the absence of the reference envelope.	No	Policy, definition
45.4	Go farther than the SPARC recommendations. Suggest in the final ranking of candidate toxic hot spots, field biology (including benthic community structure) should be more important than the other two legs of the sediment quality triad.	Partially agree. Please refer to the response for Comment 45.2. Sites should still be ranked as "high" priority if two biological impacts plus chemistry hits are available.	Yes	Policy, ranking criteria
46.1	This is an opportunity for the State Board to provide guidance to the RWQCBs so that this program can be applied consistently throughout the State.	Comment acknowledged.	No	
46.2	More guidance needs to be provided to the Regional Boards for Program consistency.	Please refer to the response for Comment 5.1 and 5.11.	No	

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46.3	In the identification of a toxic hot spot, RWQCBs do not always use available data. Include language that mandates the use of readily available data, and cite all data sources. Sites are not listed, although data exists that indicate they should be included.	Please refer to the response for Comment 5.4.	No	Policy, mandatory requirement
46.4	Expand on the triad approach in the document.	Please refer to the response for Comment 5.2.	No	Policy, definition
46.5	Provide justification for determinations of areas of no concern.	Please refer to the response for Comment 5.4.	No	Policy, mandatory requirement
46.6	Priority ranking should be based on good science, and data that is less than ten years old. Also look at studies done with regard to health effects.	Please refer to the response for Comment 5.13.	No	Policy, ranking criteria
46.7	More clearly define appropriate analytical methods for the Regional Boards' guidance. Define regularly, occasionally, and infrequently. Pollution source should not be used as a criterion.	Please refer to the response for Comment 5.15 and 3.2.	Yes (for "pollutant sources") and No for remainder of Comment.	Policy, ranking criteria
46.8a	Need additional guidance on how to choose a cleanup method.	The proposed Policy provides sufficient guidance to the RWQCBs on choosing alternatives especially with respect to complying with Water Code Section 13360.	No	Policy, remediation alternatives
46.8b	Language in the document seems to favor capping in place or no action. Cost of cleanup will be a large issue.	Comment acknowledged.	No	Policy, cleanup
46.8c	If no remediation is the finding at a site, it must be strongly substantiated, based on a full scale use attainability analysis. If no remediation is warranted due to environmental hazards, then all future dredging projects should be prohibited in the area.	If it is appropriate for a Federal use attainability analysis to be considered by the RWQCBs in development or implementation of the cleanup plans that should be completed under existing authorities and mandates of the Clean Water Act. The proposed Policy does not need to repeat or duplicate existing requirements.	No	Policy, prevention
46.8d	If environmental hazard is associated with clean up, there should be an independent scientific verification of this.	Identification of the hazards associated with remediation activities should be considered by the	No	

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
		RWQCBs in developing the cleanup plans and in the plan implementation.		
46.9	Future WDRs should not allow the discharge of identified pollutants that contribute to toxic hot spots	Please refer to the response for Comment 5.24.	No	Policy, Prevention
46.10	Take note of the use attainability analysis criticism with the substantial widespread economic impact.	Please refer to the response for Comment 46.8c.	No	Policy, prevention
47.1	Due to the migratory nature of fish, do not use a health advisory as a trigger for designation of a toxic hot spot. There should be a trigger for follow-up use for the triad criteria which have been established.	Please refer to the response for Comment 3.1 and 18.8.	No	Policy, definition
47.2	Identification of a responsible party should not be a factor in prioritization. An immediate threat to human health and the environment, and the loss of beneficial uses should determine prioritization of sites.	Please refer to the response for Comment 3.2.	Yes	Policy, ranking criteria
47.3	It is inappropriate to have the NAS information in the policy. The SWRCB should use it as a resource, but not include it as part of the policy.	Please refer to the response for Comment 3.3.	No	Policy, sediment cleanup methods
47.4	Recommend removal of cost estimates from the policy. Set up the criteria for areal extent, type of activities that are impaired, distance to shore, available disposal options on land and in water.	Please refer to the response for Comment 3.4.	No	Policy, ranking criteria
47.5	Prevention or exacerbation of toxic hot spots should be a priority. This section needs to be strengthened in the document. Do not duplicate Federal efforts on a toxic hot spot.	Please refer to the response for Comment 3.5.	No	Policy, prevention
47.6	Limited resources should be focused on sites that are not being addressed by other programs.	Please refer to the response for Comment 3.5.	No	
47.7	Need a mechanism for delisting sites.	Please refer to the response for Comment 3.6.	Yes	
48.1	The BPTCP has provided the San Diego Regional Board with an excellent tool for identifying toxic hot spots and given the Board defensible information to require cleanup actions at these sites.	Comment acknowledged.	No	
49.1	State staff have come up with a balanced approach	Comment acknowledged.	No	

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	between the State and Regional board activities, allowing for some flexibility in determining what needs to be done within each region.			
49.2	FED, page xxii . Insert "California" before the use of "Department of Health Services".	Please refer to the response for Comment 25.2.	No	Policy, page xxii
49.3	Use all available data when developing and prioritizing the toxic hot spot list.	Please refer to the response for Comment 25.3.	No	
49.4	Once a toxic hot spot list is developed, is it re-evaluated at some point in time? What determines that re-evaluation period? Will the toxic hot spot criteria for listing be changed?	Please refer to the responses for Comments 25.4 and 25.5	No	
49.5	FED, page 117. Growth inducing impacts were not properly addressed, and therefore may not have met CEQA.	Please refer to the response for Comment 25.7.	No	FED, page 117
50.1 (a)	Need a consistent and objective implementation of the policy among the RWQCBs, including a baseline level protection for all the state bays and estuaries.	Please refer to the response for Comment 5.1 and 5.11.	No	
50.1 (b)	Need mandatory pollution prevention strategies.	Please refer to the response for Comment 3.5.	No	Policy, prevention
50.2 (a)	Support the alternative to define candidate and known toxic hot spot. Do not believe that this was followed in the San Diego cleanup plan. The regional board applied discretion without the authority to do so.	In developing the proposed regional toxic hot spot cleanup plan (RWQCB, 1997g) the RWQCB implemented the suggested guidance document appropriately.	No	Policy, definition
50.2 (b)	There needs to have state oversight, consistent application of the State Board's guidance and more clear direction on what defines sufficient information.	Please refer to the response for Comment 6.3.	No	
50.3	There has been inconsistent standards used in defining toxicity and chemistry exceedances. SWRCB needs to set baseline levels of measuring standards.	Please refer to the response for Comment 6.3.	No	Policy, definition
50.4	SWRCB needs to have a process for instances when we believe the Regional Board violates their mandate.	Any action of the RWQCB can be petitioned to the SWRCB.	No	

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50.5	Disagree with the ranking criteria. Criteria with no information currently receives a value of no action. Each ranking criteria should not be given equal weight since they do not have equal importance in protecting human health and the environment. This potentially puts a higher priority on sites with low contamination but a known pollution source over sites with high contamination but an unknown pollution source.	Please refer to the response for Comment 6.4.	No	Policy, ranking criteria
50.6	Consider dividing the criteria and give each toxic hot spot two rankings. The first based on the site's impact to human health and the environment. The second would be based on other criteria. Each site would have a double score, such as high, high or high, moderate, etc.	Please refer to the response for Comment 6.6.	No	Policy, ranking criteria
50.7	Criteria should not be given a no action or zero score when information is lacking.	Please refer to the response for Comment 6.7.	No	Policy, ranking criteria
50.8	RWQCBs should not have the discretion to determine which sites should be prioritized as toxic hot spots.	Please refer to the response for Comment 5.11.	No	Policy, ranking criteria
50.9	How will these toxic hot spots be cleaned up, and what will be done to prevent ongoing pollution.	The guidance is contained in the proposed Policy. The precise mechanisms for implementation of the cleanup plans are not known now. The SWRCB will make recommendations on this point in the consolidated plan.	No	
50.10	All identified pollutant sources at known toxic hot spots should be required to conduct an independent pollution prevention audit to provide options and recommendations for actions.	Please refer to the response for Comment 28.8, 30.14 and 30.17.	No	Policy, prevention
51.1	We are really interested in seeing this program be effective.	Comment acknowledged.	No	
51.2	The definition and the program has been oriented in a very broad fashion.	Comment acknowledged.	No	Policy, definition

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51.3	90 percent of our sediments are clean and are deemed clean, meaning they are deemed suitable for unconfined aquatic disposal.	Comment acknowledged. This assessment appears to have not been made using the definition of the toxic hot spot in the proposed Policy.	No	
51.4	We want the program to get to being more focused and narrowed toward the sites that are toxic and then we can effectively clean those up.	Comment acknowledged.	No	Policy, definition
51.5	The Bay is a sink for everything that runs into the bay. We bear the burden for removing those sediments. We become the sole responsible party. We want it to be done in an effective way and a more focused way.	Comment acknowledged.	No	
51.6	The definition should look to repeated toxicity associations. Note the importance of a weight of evidence approach. Currently you have to have only one of the five or six criteria. It should be two or more.	Please refer to the response for Comment 30.5.	No	Policy, definition
51.7	Fish consumption criteria, we do not see that as a cleanup effort.	Comment acknowledged.	No	Policy, definition
51.8	The SWRCB should develop a whole set of ranking criteria that are more related to the risks posed by the listed hot spots.	Comment acknowledged.	No	Policy, ranking criteria
51.9	The NAS cleanup methods are very costly and should not be used in this broad program.	Comment acknowledged.	No	Policy remediation alternatives
51.10	The RWQCBs need to discuss the relationship of other programs.	The cleanup plans are aimed at providing the information required by law. The RWQCBs will provide information on what actions are taking place at sites but will not develop an overall assessment of all programs.	No	
52.1	Data has been used in a positive way to formulate planning, identification and consideration of other SWRCB program has been considered to some extent, creative and effective use of CEQA is proposed in concept, current known technologies for	Comments acknowledged.	No	

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	addressing sediment pollution are drawn together effectively, and the FED is logically organized.			
52.2	Listing an entire water body will not solve water quality problems and will assure they will never be solved.	Please refer to the response for Comment 3.1.	No	Policy, definition
52.3	Policy, Page xxi, Ranking Criteria. Is the "value of the water body" the same as described in the Clean Water Strategy or the 303(d) listings?	Please refer to the response for Comment 28.13.	No	Policy, ranking criteria
52.4	Related to the water quality objectives ranking criterion, it seems that data 10 years old may be too old for purposes of ranking.	Please refer to the response to Comment 12.27.	No	Policy, ranking criteria
52.5	Related to the water quality objectives ranking criterion, the terms 'regularly", "occasionally" and "infrequently" should be defined.	Please refer to the response for Comment 5.15 and 28.15.	No	Policy, ranking criteria
52.6	The rationale for using an areal extent criterion for ranking seems backward.	Please refer to the response for Comment 28.16.	No	Policy, ranking criteria
52.7	"Pollutant source" and "source" should be defined. The definition should include more than dischargers who hold WDRs.	Please refer to the response for Comment 3.2.	Yes	Policy, ranking criteria
52.8	The proposed ranking criteria should allow for more than a summary description of the ongoing regulatory efforts.	Please refer to the response for Comment 28.18.	No	Policy, ranking criteria
52.9	The ranking criteria should include a value for the interrelationships of existing programs give priority to sites with the framework for watershed management.	Please refer to the response for Comment 28.19.	No	Policy, prevention
53.1	The specific definition of a candidate toxic hot spot and the use of criterion number three, the issuance of a health advisory is inappropriate.	Please refer to the response for Comment 3.1.	No	Policy, definition
53.1a	Concern over the entire San Francisco Bay under this method.	Please refer to the response for Comment 3.1.	No	Policy, definition
53.1b	The weight of evidence approach based on a triad of testing protocols is being ignored.	Please refer to the response for Comment 5.2.	No	Policy, definition

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53.2	The use of pollutant sources as a criterion in the ranking process ignores some of the worst of the worst sites not having an identified responsible party.	Please refer to the response for Comment 3.2.	Yes	Policy, ranking criteria
53.3	The prevention of toxic hot spots - coordination between BPTCP and other programs. Every effort should be made to avoid redundancy and duplication.	Comment acknowledged.	No	Policy, prevention
54.1	The toxic hot spot definition does not seem to include most pesticides.	Pesticides in water are pollutants and can negatively impact aquatic life beneficial uses.	No	Policy, definition
54.2	The term "have accumulated" should be reserved to describe substances of which concentrations increased in water or sediment over time. Substances should not be regarded as accumulative if their presence in water or sediment is transitory.	Pesticides do accumulate to levels in water that impact beneficial uses and therefore are covered under the definition.	No	Policy, definition
54.3	If BPTCP were to apply the pesticides, board staff would have conferred with DPR.	SWRCB and RWQCB staff have conferred with DPR about the BPTCP, the proposed guidance, and the proposed toxic hot spot cleanup plans.	No	
54.4	The definition of candidate toxic hot spots - It is believed that the Board staff developed the candidate toxic hot spots and if this is the case the candidate list lacked regulatory context and their value is limited.	Comment acknowledged.	No	Policy, definition
54.5	Eliminate the concept of candidate toxic hot spots altogether.	The category of candidate toxic hot spot is needed so reevaluation of WDRs is not required before the consolidated cleanup plan is completed.	No	Policy, definition
55.1	Request more time for written comments.	The record closing date was changed from May 11, 1998 to May 15, 1998.	No	
55.2	Concerns of the definition related to the term accumulation in relation to currently used pesticides. We believe that pesticides which do not accumulate in the water or sediment should not be characterized as responsible for toxic hot spots and should not be included in the plans.	Please refer to the response for Comment 52.1 and 52.2.	No	Policy, definition
55.3	Adoption of the guidance as proposed, we believe, will compromise the effectiveness of the PMP and	Please refer to the response for Comment 14.3.	No	

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	the integrity of the MAA by creating an unnecessarily redundant inappropriate program for pesticides.			
55.4	Guidance for programs to address pesticides and surface water quality should recognize the unique nature of the extensive scientific information that supports the registration.	Comment acknowledged.	No	
55.5	Assessments on pesticides should be based on risk of an adverse effect, not hazard.	Please refer to the response for Comment 13.2. The approaches have been applied to water in Region 5 where pesticides have been identified as a pollutant of concern.	No	Policy, definition
55.6	We advocate the use of probabilistic, ecological risk assessment consistent with the U.S. EPA guidelines as endorsed by OEHHA and the U.S. EPA, Science Advisory Panel.	Comment acknowledged.	No	Policy, definition
55.7	We do not believe the proposed guidance should support the inclusion of pesticides that do not accumulate. And we believe that the guidance does not consider the more refined science available for pesticides.	Please refer to the response for Comment 52.1 and 52.2.	No	Policy, definition
56.1	There hasn't been sufficient time to review the policy and the guidance. Would like a two week extension.	Please refer to the response for Comment 55.1.	No	
57.1	The ranking criteria has a lack of consistency from region to region.	Please refer to the response for Comment 5.11.	No	Policy, ranking criteria
57.2	Aerial extent - We feel that this criterion should not be used.	Please refer to the response for Comment 10.2 and 10.7.	No	Policy, ranking criteria
57.3	Pollutant source should not be used.	Please refer to the response for Comment 3.2.	Yes	Policy, ranking criteria
57.4	Pollution prevention - nothing has been done about this.	Please refer to the response for Comment 10.12.	No	Policy, prevention
57.5	Only a couple days extension would be appropriate.	Please refer to the response for Comment 55.1.	No	

COMMENT NUMBER	SUMMARY OF COMMENT	RESPONSE	REVISION	SECTION/ AREA
58.1	Only list those sites that are severely contaminated causing environmental or public health risks and not just listing all the water bodies in the state.	Please refer to the response for Comment 30.2.	No	Policy, definition
58.2	The State Board can use its discretion to narrow the definition to focus on contaminated sediment sites.	Please refer to the response for Comment 30.2	No	Policy, definition
58.3	We support a weight of evidence approach where our suggestion would be to change the definition to have it meet two or more of the conditions listed.	Please refer to the response for Comment 30.5.	No	Policy, definition
58.4	We believe that the sites should be listed according to the most severely contaminated sites.	Please refer to the response for Comment 30.8.	No	Policy, ranking criteria
58.5	We suggest a proposal for alternative categorizations of contaminated sites.	Please refer to the response for Comment 30.9.	No	Policy, ranking criteria
58.6	Narrow the definition or drastically expand the cleanup methods section to address how you plan on cleaning up these low level water quality contamination and fish tissue issues.	Please refer to the response for Comment 30.10.	Yes	Policy, definition
58.7	Have a watershed approach and pull in everything, nonpoint sources, which can be a large contributor to the toxic hot spot sites.	Please refer to the response for Comment 28.1, 30.13 and 30.15.	Yes	Policy, prevention
58.8	Regarding WDRs, we suggest that the State Board issue guidance to the regional boards on how to amend those waste discharge requirements when the time comes.	Please refer to the response for Comment 12.48.	Yes	Policy, prevention
58.9	Streamline this program to avoid duplication with existing cleanup programs such as Superfund, Department of Defense, DTSC programs and the TMDL process.	Please refer to the response for Comment 28.5.	No	Policy, prevention
59.1	The proposed definition of a toxic hot spot is too broad and contains too many different separate criteria. Be more focused. Multiple criteria should be met in order to qualify as a hot spot.	Please refer to the response for Comment 30.5.	No	Policy, definition
59.2	This policy should go further to avoid duplication and overlap.	Please refer to the response for Comment 28.5.	No	

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59.3	We are concerned about the CEQA analysis, as well as the proposed approach to CEQA compliance for the regional and statewide cleanup plans. We do not think that the FED has adequately analyzed the potential environmental impacts that may result from this policy.	Please refer to the response for Comment 3.29 and 30.30.	No	Policy, environ-mental impacts, Checklist
60.1	In the definition of a hot spot it doesn't make sense to include exceedance of sediment quality objectives, since they don't exist for the enclosed bays and estuaries in California right now.	Please refer to the response for Comment 5.9.	No	Policy, definition
60.2	The policy document should indicate what methods and guidelines are appropriate for interpreting sediment chemistry data.	Please refer to the response for Comment 5.9.	No	Policy, definition
60.3	The use of considering pollutant sources should not be part of the ranking criteria.	Please refer to the response for Comment 3.2.	Yes	Policy, ranking criteria
60.4	Program costs are not adequately addressed as those previously mentioned.	Comment acknowledged. Please refer to the response for Comment 7.5a, 7.5b and 7.5c.	No	Policy, cleanup costs
60.5	Page 99 on the FED, there's a comment that says stricter effluent limits can help remediate and prevent recurrence of toxic hot spots.	Please refer to the response for Comment 7.8.	Yes	FED page 99
60.6	We're very concerned that the Bay Protection Program be integrated with existing programs.	Please refer to the response for Comment 7.11.	No	Policy, prevention
60.7	The policy indicates that cleanup plans should contain a preliminary assessment of actions required to remedy or restore a toxic hot spot to an unpolluted condition, but there's no definition of unpolluted condition and no recommendation for follow-up monitoring that you might use.	Please refer to the response for Comment 30.23.	Yes	Policy, remediation alternatives
61.1	We support the statements from Heal the Bay.	Please refer to the responses for Commenter 5 and 44.	No	
61.2	I urge you to move forward with this policy.	Comment acknowledged.	No	
61.3	Ranking criteria is one area that needs a little bit of work.	No response is necessary.	No	Policy, ranking criteria

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61.4	Using aerial extent of contamination, as an equal ranking, is not appropriate.	Comment acknowledged.	No	Policy, ranking criteria
62.1	There is no question for the need for the BPTCP and this policy.	Comment acknowledged.	No	
62.2	Use of aquatic chemistry components will lead to massive litigation.	Please refer to the response for Comment 13.28.	No	
62.3	The chemical approaches are not credible. Use TIEs, do not rely on total concentrations of chemicals.	Please refer to the responses for Comments 13.2, 13.3, 13.7 13.11 and 13.13.	No	Policy, definition
62.4	Appoint a technical advisory committee who can work with all interested parties to develop appropriate toxic hot spot designations and ranking.	Please refer to the responses for Comments 13.6 and 13.86.	No	Policy, definition, ranking criteria

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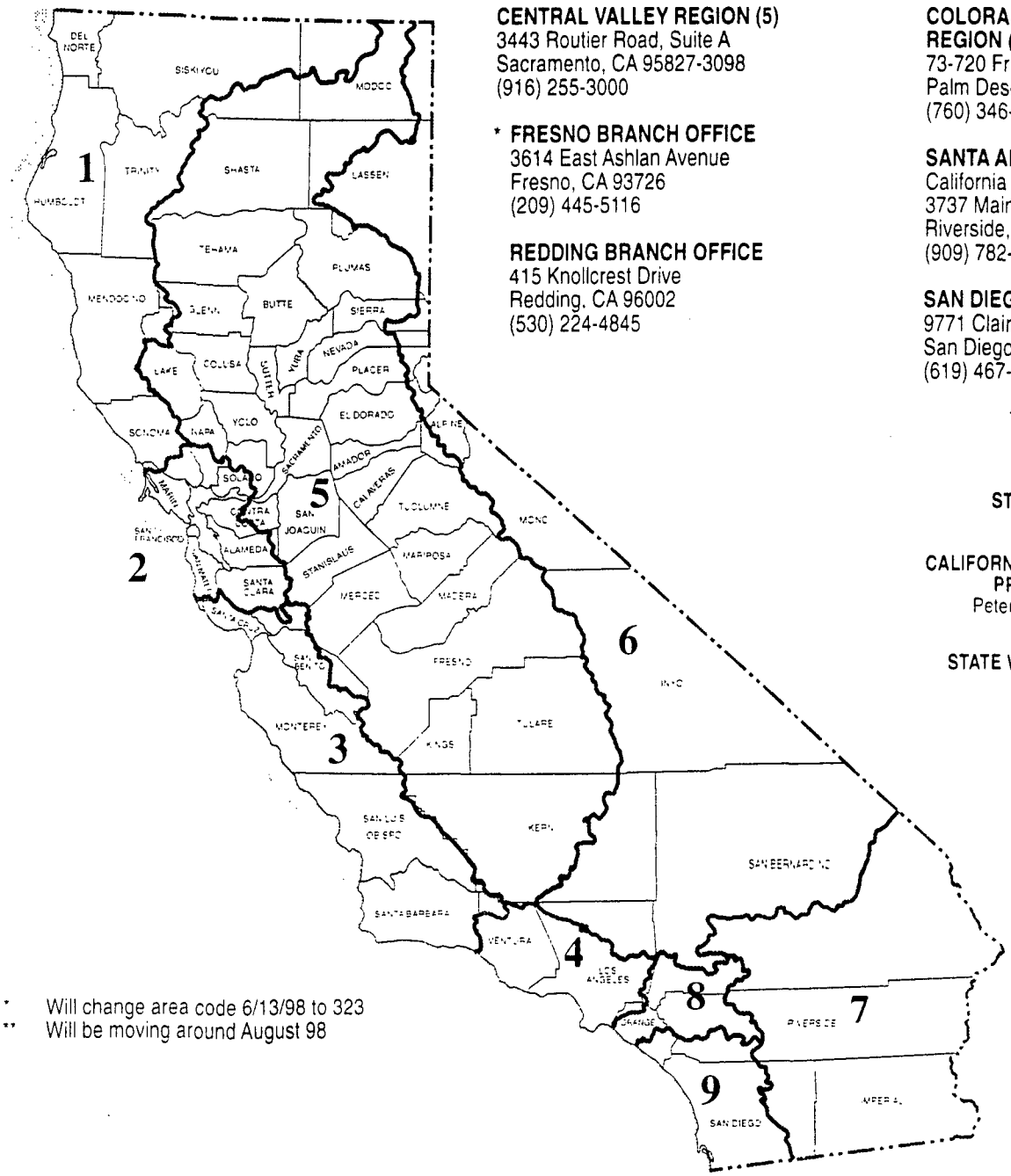

* Will change area code 6/13/98 to 323
** Will be moving around August 98

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