

State of California

STATE WATER RESOURCES CONTROL BOARD

CONSOLIDATED TOXIC HOT SPOTS CLEANUP PLAN

VOLUME I: POLICY, TOXIC HOT SPOT LIST~~S~~ AND FINDINGS |

~~DRAFT FINAL~~ FUNCTIONAL EQUIVALENT DOCUMENT |  
APPENDIX A

~~August 29, 2003~~ June 1999 |

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## *Consolidated Toxic Hot Spots Cleanup Plan*

### *Volume I: Policy, Toxic Hot Spot Lists and Findings*

## **Introduction**

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) are required to (1) identify and characterize toxic hot spots, (2) plan for the cleanup or other appropriate remedial or mitigating action at the sites, and (3) prevent the creation of new toxic hot spots and the further pollution of existing hot spots (Water Code Section 13392). Toxic hot spots have been identified in California's enclosed bays, estuaries and coastal waters. The SWRCB adopted guidance in 1998 on the development of the Regional Toxic Hot Spots Cleanup Plans (Regional Plans). ~~Each of the~~ ~~Regional~~ ~~cleanup-~~ ~~Plans~~ have been incorporated into the Consolidated Toxic Hot Spots Cleanup Plan (Consolidated Plan).

As required by Water Code Section 13394, the SWRCB has developed this Consolidated ~~Statewide Toxic Hot Spots Cleanup~~ Plan that identifies and ranks known toxic hot spots. This plan also presents descriptions of toxic hot spots, actions necessary to remediate sites, the benefits of remediation, and a range of remediation costs. This plan is applicable, in its entirety, to point and nonpoint source discharges to the waters of the State that can be reasonably determined by the RWQCBs to contribute to or cause the pollution at toxic hot spots.

This Consolidated Plan contains two volumes: Volume I contains the policy statements, definitions and criteria to rank sites, the list of known toxic hot spots, a summary of the actions planned for high priority known toxic hot spots, and findings; and Volume II contains the Regional ~~Toxic Hot Spots Cleanup~~ Plans.

## **Background**

Water Code Section 13394 requires that the SWRCB and each RWQCB complete toxic hot spots cleanup plans. Each ~~C~~cleanup ~~P~~plan must include: (1) a priority listing of all toxic hot spots covered by the ~~C~~cleanup ~~P~~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 ~~C~~leanup ~~P~~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; (7) a two-year expenditure schedule identifying State funds needed to implement the ~~C~~leanup ~~P~~plan; and (8) for the SWRCB, findings on the need to establish a toxic hot spots cleanup program.

## **Policy for Water Quality Control**

In furtherance of legislative intent set forth in Section 13390 of Division 7 of the California Water Code (Stats. 1989, Chap. 269) the SWRCB hereby finds and declares that protection of the quality of the enclosed bays, estuaries and coastal waters for use and enjoyment by the people of the State requires the implementation of remedial actions that provide protection of existing and future beneficial uses and that these actions be implemented through a plan for remedial action at toxic hot spots.

The provisions of the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan are intended to establish principles and guidance to protect and improve the quality of the enclosed bays, estuaries and coastal waters of the State from discharges of hazardous substances in accordance with the provisions of Chapter 5.6 of the California Water Code.

### ***Remediation (if Potential Discharger Identified)***

The RWQCBs shall implement the remediation portions of this Consolidated ~~Toxic Hot Spots Cleanup~~ Plan (Volume II) to the extent that responsible parties are identified and funds are available and allocated for this purpose.

The RWQCBs shall use their existing authorities to issue and revise waste discharge requirements (WDRs), issue and implement enforcement actions pursuant to existing ~~P~~policies, including but not limited to, the Water Quality Enforcement Policy and SWRCB Resolution No. 92-49 (as amended on April 21, 1994 and October 2, 1996). To the extent possible, the RWQCBs shall encourage potential dischargers to address known toxic hot spots through voluntary implementation of corrective actions.

***Remediation (in Absence of Potential Discharger)***

When no potential discharger is identified, the RWQCBs shall seek funding from available sources to remediate the site.

**Funding Programs**

There are several federal and State funding programs currently in place that RWQCBs shall evaluate as potential funding sources to remediate toxic hot spots. These include the following:

Clean Water Act (CWA) Section 319 Nonpoint Source Grants

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 **problems in** waters listed pursuant to CWA Section 303(d) as water quality limited segments.

Wetlands Grants

CWA Section 104(b) 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 assessment and monitoring information.

State Revolving Funds Loan Program

The State Revolving Funds Loan Program provides funding for the construction of publicly-owned treatment works, for nonpoint source mitigation 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.

State Water Pollution Cleanup and Abatement Account (Cleanup and Abatement Fund)

The Cleanup and Abatement Fund (Water Code Section 13440 et seq.) can be used by the SWRCB to pay for cleaning up waste or abating the waste effects on waters of the State. RWQCBs may apply for these funds if, among other things, the RWQCB does not have adequate resources budgeted for this activity.

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.

Supplemental Environmental Projects

The RWQCB may impose administrative civil liability orders on 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. As part of this process the RWQCB may direct dischargers to provide funding for a Supplemental Environmental Project.

Mass-based Permit Offset System (Trading Credits)

A mass-based permit offset system is a tool used to ensure that the largest controllable ongoing sources of pollutants and most cost-effective approaches are used to reduce the discharge of pollutants. An offset system provides an increase in flexibility for dischargers with potential compliance problems or for groups that wish to develop credit for anticipated offset of future loads associated with future population growth or increase in industrial discharges.

In using this approach, the RWQCBs shall consider the following factors: (1) application of the system to sites that do not have a responsible discharger identified,

(2) bioaccumulation of pollutants at sites near discharges, (3) toxicity at sites where pollutants are allowed at higher concentrations, and (4) the chemical form of the pollutant discharged.

### Remediation in San Diego Bay

San Diego Bay is one of the most precious economic and environmental resources in California and there is significant public concern about all the toxic hot spots identified in the Bay.

The San Diego RWQCB shall develop the characterization and remediation portions of the cleanup plan for the moderate priority known toxic hot spots identified in this Plan. In developing the revised cleanup plan the San Diego RWQCB shall (1) use the Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup Plans and (2) submit a revised Regional Plan within one year of the effective date of the Consolidated Plan.

To the extent that funding is available, the RWQCB shall initiate remediation or require potential dischargers to remediate each known toxic hot spot in San Diego Bay.

### ***Toxic Hot Spot Prevention***

In the process of developing and implementing strategies to remediate 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 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.

### **Waste Discharge Requirement Reevaluation Guidance**

In order to prevent the further pollution or creation of known toxic hot spots, RWQCBs shall reevaluate WDRs in compliance with Water Code Section 13395. The reevaluation shall consist of (1) an assessment of the WDRs that may influence the creation or further pollution of the known toxic hot spot, (2) an assessment of which WDRs need to be modified to improve environmental conditions at the known toxic hot spot, and (3) a schedule for completion of any WDR modifications deemed appropriate.

When revising WDRs associated with known toxic hot spots, the RWQCBs shall comply with the provisions of Water Code Sections 13395 to the extent this Section applies. The RWQCB shall acknowledge in the WDR that

the discharge may contribute to the pollution present at the toxic hot spot listed in the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan.

RWQCBs shall begin reevaluation of WDRs associated with high priority known toxic hot spots within 120 days after final approval of the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan. WDR reevaluation will be completed for all known toxic hot spots in ranked order. The RWQCBs shall submit a priority list to the SWRCB presenting the reevaluation as follows:

1. The list of WDRs associated with each known toxic hot spot that can reasonably be expected to cause or contribute to the creation and maintenance of the known toxic hot spot.
2. An assessment of the need to revise the WDR to improve the quality of the known toxic hot spot.
3. A schedule for completion of the needed WDR revisions.

Each RWQCB shall submit the priority list for high priority toxic hot spots within six months after final approval of the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan. The priority list for moderate and low priority known toxic hot spots shall be submitted within one year of final approval of the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan.

Reevaluation, as used in this plan and in Water Code Section 13395, does not mean the RWQCBs must revise WDRs associated with known toxic hot spots.

### ***Removing Toxic Hot Spots from the Plan***

A site may be removed from the known toxic hot spot list and other portions of this Consolidated Plan if the SWRCB determines that the site has been adequately remediated, was inappropriately listed as a toxic hot spot, or no longer qualifies as a toxic hot spot (as defined). The process for removing a site from the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan is as follows:

1. A petition shall be submitted to the SWRCB to remove a site from the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan. This petition shall provide:

- The reason for site delisting
  - Documentation of investigations performed to demonstrate the site is no longer a toxic hot spot (post-remediation monitoring)
  - Documentation of all remediation actions taken
  - Documentation of the likelihood the toxic hot spot will be prevented from reoccurring
2. If the petition is submitted by a discharger, the SWRCB shall seek a recommendation on the petition by the appropriate RWQCB. If the petition is approved by the SWRCB, the site shall be removed from the toxic hot spot list and other portions of the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan.

## Toxic Hot Spot Identification and Ranking

### *Definition Used to Identify Candidate and Known Toxic Hot Spots*

Candidate and known toxic hot spots are locations (sites in waters of the State) in enclosed bays, estuaries or the ocean. Dischargers (e.g., publicly owned treatment works, industrial facilities, power generating facilities, agricultural land, storm drains, etc.) are not toxic hot spots.

Pesticide residues should not be considered under the Bay Protection and Toxic Cleanup Program (~~BPTCP~~) if they are detected in the water column in a pattern of infrequent pulses moving by the sampling location. Such detections will be addressed using cooperative approaches such as the Management Agency Agreement between the SWRCB and the Department of Pesticide Regulation, the NPS Management Plan, and existing authorities including the Porter-Cologne Water Quality Control Act and Clean Water Act.

### **{PRIVATE }Candidate Toxic Hot Spot{tc \l 3 "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 90 percent of the minimum significant difference for each specific test organism), 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.

**{PRIVATE }Known Toxic Hot Spot{tc \l 3 "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 Spots 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- 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 substantial information available. 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 substantial 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<sup>2</sup>**

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.”

**Benefits of Remediation**

In developing the Regional ~~Toxic Hot Spots Cleanup~~ Plans the RWQCBs listed the qualitative benefits that will be derived by remediating toxic hot spots. The list of possible benefits of remediation are presented in Table 1. ~~The beneficial use improved is listed in the summary of the Regional Cleanup Plans (Table 3).~~

**TABLE 1. BENEFICIAL EFFECTS OF REMEDIATION**

Beneficial effect	Values quantifying these beneficial effects	Beneficial use affected
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<sup>1</sup> Water quality objectives to be used are found in RWQCB 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.

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

## Known Toxic Hot Spots

The RWQCBs have used the definition of toxic hot spots to identify candidate toxic hot spots and have used the ranking criteria to identify the highest priority sites for remedial action. The list in Table 2 is the list of known toxic hot spots in California's enclosed bays, estuaries and coastal waters. The general locations of the known toxic hot spots are presented in Figure 1.

A detailed list of the known toxic hot spots for each region is presented in Volume II of the Consolidated ~~Toxic-Hot Spots Cleanup~~ Plan.

The remedial actions, benefits of remediation and estimated remediation costs for the high priority toxic hot spots are listed in Table 3. More specific information on site characterization, benefits of remediation, proposed action and costs are presented in the Regional ~~Toxic-Hot Spots Cleanup~~ Plans (Volume II).

## Mitigation Necessary to Avoid the Potential Environmental Impacts of Remediation

The provisions of the Consolidated ~~Toxic-Hot Spots Cleanup~~ Plan do not relieve the RWQCBs from complying with CEQA when requiring site-specific projects be completed or when amending their Basin Plans to incorporate the results of their planning efforts called for in the Consolidated Plan. Mitigation measures are presented in Table 4. These mitigation measures shall be considered by the RWQCBs to lessen or avoid ~~reduce~~ the potential environmental impact of a site-specific project.

The mitigation measures presented in this Consolidated Plan address potentially significant adverse impacts on a broad, Statewide basis. These mitigation measures do not replace the need for site-specific measures or a site-specific analysis of environmental impacts. The mitigation measures in the Consolidated Plan are intended to focus the analysis, when possible, on the resources that are likely to be affected when site-specific projects are implemented.

TABLE 2: KNOWN TOXIC HOT SPOTS

Rank	Site Identification	Reason for Listing	
		Definition trigger	Pollutants
High	Cañada de la Huerta Shell Hercules Gas Plant Site	Aquatic Life Concerns - Sediment and water toxicity, sediment chemistry, bioaccumulation, Water Quality Concerns - violations of Basin Plan and Ocean Plan objectives.	PCBs
High	Delta Estuary, Cache Creek watershed including Clear lake	Human health impacts	Mercury
High	Delta Estuary	Aquatic life impacts	Diazinon
High	Delta Estuary - Morrison Creek, Mosher Slough, 5 Mile Slough, Mormon Slough & Calaveras River	Aquatic life impacts	Diazinon & Chlorpyrifos
High	Delta Estuary - Ulatis Creek, Paradise Cut, French Camp & Duck Slough	Aquatic life impacts	Chlorpyrifos
High	Humboldt Bay Eureka Waterfront H Street	Bioassay toxicity	Lead, Silver, Antimony, Zinc, Methoxychlor, PAHs
High	Los Angeles Inner Harbor Dominguez Channel, Consolidated Slip	Human health, aquatic life impacts	DDT, PCBs, PAH, Cadmium, Copper, Lead, Mercury, Zinc, Dieldrin, Chlordane
High	Los Angeles Outer	Human health, aquatic life	DDT, PCBs, Copper

Rank	Site Identification	Reason for Listing	
		Definition trigger	Pollutants
	Harbor Cabrillo Pier	impacts	
High	Lower Newport Bay Rhine Channel	Sediment toxicity, exceeds objectives	Arsenic, Copper, Lead, Mercury, Zinc, DDE, PCB, TBT
<u>High</u>	<u>McGrath Lake</u>	<u>Sediment toxicity</u>	<u>DDT, Chlordane, Dieldrin, Toxaphene, Endosulfan</u>
High	Moss Landing Harbor and Tributaries	Aquatic life and human health concerns - Sediment chemistry, toxicity, bioaccumulation and exceedances of NAS and or FDA guidelines	Pesticides, PCBs, Nickel, Chromium, TBT
High	Mugu Lagoon/ Calleguas Creek tidal prism, Eastern Arm, Main Lagoon, Western Arm,	Aquatic life impacts	DDT, PCBs, metals, Chlordane, Chlorpyrifos
High	San Diego Bay Seventh St. Channel Paleta Creek, Naval Station	Sediment toxicity and benthic community impacts	Chlordane, DDT, PAHs and Total Chemistry <sup>2</sup>
High	San Francisco Bay Castro Cove	Aquatic life impacts	Mercury, Selenium, PAHs, Dieldrin
High	San Francisco Bay Entire Bay	Human health impacts	Mercury, PCBs, Dieldrin, Chlordane, DDT, Dioxin Site listing was based on Mercury and PCB health advisory
High	San Francisco Bay Islais Creek	Aquatic life impacts	PCBs, chlordane, dieldrin, endosulfan sulfate, PAHs,

<sup>2</sup> The total toxic chemical concentrations for a station were was calculated as follows: The sum of individual ERMs (or PELs) was divided by the number of chemicals analyzed for which ERMs (or PELs) were known. The "average" ERM (or PEL), known as the Effects Range Median Quotient or ERMQ (or Probable Effects Level Quotient or PELQ) was compared to the "threshold" ERMQs (or PELQs) calculated to be 0.85 X ERMQ (or 1.29 X PELQ). If a threshold quotient was equaled or exceeded, the station was assumed to have a total chemistry hit

Rank	Site Identification	Reason for Listing	
		Definition trigger	Pollutants
			anthropogenically enriched H <sub>2</sub> S and NH <sub>3</sub>
High	San Francisco Bay Mission Creek	Aquatic life impacts	Silver, Chromium, Copper Mercury, Lead, Zinc, Chlordane, Chlorpyrifos, Dieldrin, Mirex, PCBs, PAHs, anthropogenically enriched H <sub>2</sub> S and NH <sub>3</sub>
High	San Francisco Bay Peyton Slough	Aquatic life impacts	Silver, Cadmium, Copper, Selenium, Zinc, PCBs, Chlordane, ppDDE, Pyrene
High	San Francisco Bay Point Potrero/ Richmond Harbor	Human health	Mercury, PCBs, Copper, Lead, Zinc
High	San Francisco Bay Stege Marsh	Aquatic life impacts	Arsenic, Copper, Mercury, Selenium, Zinc, chlordane, dieldrin, ppDDE, dacthal, endosulfan 1, endosulfan sulfate, dichlorobenzophenone, heptachlor epoxide, hexachlorobenzene, mirex, oxidiazon, toxaphene and PCBs
High	San Joaquin River at City of Stockton	Exceedances of water quality objective	Dissolved oxygen
High	Santa Monica Bay Palos Verdes Shelf	Human health, aquatic life impacts	DDT, PCBs
Moderate	Anaheim Bay, Naval Reserve	Sediment toxicity	Chlordane, DDE

Rank	Site Identification	Reason for Listing	
		Definition trigger	Pollutants
Moderate	Ballona Creek Entrance Channel	Sediment toxicity	DDT, zinc, lead, Chlordane, dieldrin, chlorpyrifos
Moderate	Bodega Bay-10006 Mason's Marina	Bioassay toxicity	Cadmium, Copper, TBT, PAH
Moderate	Bodega Bay-10028 Porto Bodega Marina	Bioassay toxicity	Copper, lead, Mercury, Zinc, TBT, DDT, PCB, PAH
Moderate	Delta Estuary Delta	Aquatic life impacts	Chlordane, Dieldrin, Lindane, Heptachlor, Total PCBs, PAH & DDT
Moderate	Delta Estuary Delta	Human health impacts	Chlordane, Dieldrin, Total DDT, PCBs, Endosulfan, Toxaphene
Moderate	Delta Estuary Smith Canal, Mosher & 5-Mile, Sloughs & Calaveras River	Exceedance of water quality objective	Dissolved oxygen
Moderate	Los Angeles River Estuary	Sediment toxicity	DDT, PAH, Chlordane
Moderate	Upper Newport Bay Narrows	Sediment toxicity, exceeds water quality objectives	Chlordane, Zinc, DDE
Moderate	Lower Newport Bay Newport Island	Exceeds water quality objectives	Copper, Lead, Mercury, Zinc, Chlordane, DDE, PCB, TBT
Moderate	Marina del Rey	Sediment toxicity	DDT, PCB, Copper, Mercury, Nickel, Lead, Zinc, Chlordane
Moderate	Monterey Harbor	Aquatic life impacts, sediment toxicity	PAHs, Cu, Zn, Toxaphene, PCBs, Tributyltin

Rank	Site Identification	Reason for Listing	
		Definition trigger	Pollutants
Moderate	San Diego Bay Between "B" Street & Broadway Piers	Benthic community impacts	PAHs, Total Chemistry
Moderate	San Diego Bay Central Bay Switzer Creek	Sediment toxicity	Chlordane, Lindane, DDT, Total Chemistry
Moderate	San Diego Bay Chollas Creek	Benthic community impacts	Chlordane, Total Chemistry
Moderate	San Diego Bay Foot of Evans & Sampson Streets	Benthic Community Impacts	PCBs, Antimony, Copper, Total Chemistry
Moderate	San Francisco Bay Central Basin, San Francisco Bay	Aquatic life impacts	Mercury, PAHs
Moderate	San Francisco Bay Fruitvale (area in front of stormdrain)	Aquatic life impacts	Chlordane, PCBs
Moderate	San Francisco Bay Oakland Estuary. Pacific Drydock #1 (area in front of stormdrain)	Aquatic life impacts	Copper, Lead, Mercury, Zinc, TBT, ppDDE, PCBs, PAHs, Chlorpyrifos, Chlordane, Dieldrin, Mirex
Moderate	San Francisco Bay, San Leandro Bay	Aquatic life impacts	Mercury, Lead, Selenium, Zinc, PCBs, PAHs, DDT, pesticides
Low	Seal Beach NWR Navy Marsh	Sediment toxicity	DDE
Low	Seal Beach Bolsa Avenue NWR	Sediment toxicity	Arsenic
Low	Bolsa Chica Ecological	Sediment toxicity	DDE

Rank	Site Identification	Reason for Listing	
		Definition trigger	Pollutants
	Reserve		
Low	Seal Beach NWR Left Reach	Sediment toxicity	DDE
Low	Seal Beach NWR Middle Reach	Sediment toxicity	Arsenic
Low	Huntington Harbor Upper Reach	Sediment toxicity	Chlordane, DDE, Chlorpyrifos

FIGURE 1: HIGH, MODERATE, AND LOW PRIORITY TOXIC HOT SPOTS





TABLE 3: SUMMARY OF ACTIONS AND COSTS TO ADDRESS HIGH PRIORITY KNOWN TOXIC HOT SPOTS

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
Cañada de la Huerta, Shell Hercules Site	Environmental release of PCBs laden fluid used in plant heat transfer treatment process	Continue post-remediation monitoring program plus possible additional excavation and offsite disposal of polluted sediment Monitoring Site Assessment Amended RAP Implementation Total	\$300,000 \$250,000 \$50,000 \$ 2,000,000 \$ 2,600,000	COMM (SPORT FISHING), AQUA, WILD, COLD, WARM, RARE
Delta Estuary, Cache Creek	Exports from Placer gold mining regions of the Sierra Nevada; Mercury mining in the Coast Range; Resuspension of estuarine sediment; Effluent from municipal and industrial discharges to surface waters.	Studies to develop mercury control strategy: 1. Fish eating bird & egg studies plus OEHHA coordination. 2. Mercury monitoring in Cache Creek/year (multi year) 3. Mine remediation feasibility studies 4. Estuarine mercury monitoring studies (multi year)  Grand Total	\$335,000 \$1,120,000 \$150,000 \$1,500,000  \$3,105,000	COMM and WILD
Delta Estuary,	Application of Diazinon as a	The RWQCB determined that the	\$400,000 FY 2002-2003	EST, MIGR,

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
Entire Delta	dormant orchard spray in the agricultural areas of the Central Valley	<p><del>pattern of pesticide detections observed from dormant spray applications is frequent and merits consideration as a high priority THS. The RWQCB will regulate pesticides under 303(d) of the Clean Water Act and develop a load reduction program by the year 2005.</del></p> <p><u>Develop Basin Plan proposal</u></p> <p><u>R5 Implementation Oversight</u>  <u>Costs to other entities to oversee</u>  <u>Costs to Growers</u>  <u>Implementation of practices</u>  <u>Regulatory Compliance</u>  <u>Continued practices development</u>  <u>Monitoring for program effectiveness</u></p>	<p><u>\$200,000 FY 2003-2004</u>  <u>\$180,000-\$600,000/yr</u>  <u>\$0-\$300,000/yr</u></p> <p><u>\$3-\$164/acre</u>  <u>\$1,000-\$4,060/grower/yr</u>  <u>\$100,000 to \$1million/yr</u>  <u>\$100,000/yr in Delta only</u></p>	<p><u>SPWN,</u>  <u>WARM,</u>  <u>COLD, REC-</u>  <u>1, REC-2, and</u>  <u>COMM</u></p>
Delta Estuary, Morrison Creek, Mosher, 5-Mile, Mormon Slough & Calaveras River	Urban runoff	<p><del>The RWQCB determined that the pattern of pesticide detections observed from dormant spray applications is frequent and merits consideration as a high priority THS. The RWQCB will regulate pesticides under 303(d) of the Clean Water Act and develop a load reduction program by the year 2005.</del></p> <p><u>Rainfall contribution evaluation</u></p>	<p><u>\$50,000/ yr for 3 years</u>  <u>\$50,000/yr in urban creeks</u>  <u>\$50,000 to \$100,000 for cities annually</u>  <u>No additional cost</u>  <u>\$20,000/yr</u>  <u>\$50,000/yr until 2005</u>  <u>\$50,000/yr for 2 years</u></p>	<p><u>EST, MIGR,</u>  <u>SPWN,</u>  <u>WARM,</u>  <u>COLD, REC-</u>  <u>1, REC-2, and</u>  <u>COMM</u></p>

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
		<p><u>Monitoring costs for urban dischargers</u>  <u>Continued practices evaluation</u></p> <p><u>Implementation of practices</u>  <u>Regulatory agency oversight</u>  <u>Develop TMDL</u>  <u>Develop Basin Plan amendment (if needed)</u></p>		
Delta Estuary, Ulatis Creek, Paradise Cut, French Camp & Duck Slough	Agricultural use	<p><del>The RWQCB determined that the pattern of pesticide detections observed from dormant spray applications is frequent and merits consideration as a high priority</del>  <u>THS The RWQCB will regulate pesticides under 303(d) of the Clean Water Act and develop a load reduction program by the year 2005</u>  <u>Develop Basin Plan Proposal</u></p> <p><u>R5 Implementation Oversight</u>  <u>Costs to other entities to oversee</u>  <u>Costs to Growers</u>  <u>Implementation of practices</u>  <u>Regulatory Compliance</u>  <u>Continued practices development</u>  <u>Monitoring for program effectiveness</u></p>	<p><u>\$100,000 FY 2002-2003</u>  <u>\$100,000 FY 2003-2004</u>  <u>\$540,000 - \$1.8 million/yr</u>  <u>\$0-\$300,000/yr</u></p> <p><u>\$2,695-\$27,555/grower</u>  <u>\$555 to \$8,200/grower/yr</u>  <u>\$100,000 to \$1million/ yr</u>  <u>\$100,000/yr in Delta only</u></p>	<p><u>EST, MIGR, SPWN, WARM, COLD, REC-1, REC-2, and COMM</u></p>
Humboldt Bay,	Scrap metal facility including	Removal of polluted soils and	\$500,000 - \$5,000,000	NAV, REC 1,

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
Eureka Waterfront H Street	disassembly, incineration, and crushing of autos. Storage of metals, batteries , radiators, metal reclamation from electrical transformers and misc. refuse.	capping of the site		REC 2, COMM (SPORT FISHING), WILD, RARE, MAR, MIGR, SPWN, SHELL, EST, AQUA
Los Angeles/ Inner Harbor, Dominguez Channel/ Consolidated Slip	Historical discharges of DDTs, PCBs Metals. Nonpoint sources such as spills, vessel discharges, anti fouling paints and storm drains. Waste streams from refineries may also be contributing.	Dredging and offsite disposal of polluted sediments if suitable disposal site if identified  Treatment of polluted sediments	\$1,000,000-\$5000,000  \$5,000,000-50,000,000	EST (and possible improvements in other Beneficial Uses)
Los Angeles Outer Harbor, Cabrillo Pier	Historical discharge of DDTs, PCBs. Discharge of wastewater effluent from Terminal Is. Treat. Plant may contribute. Nonpoint sources include ship spills, industrial facilities and stormwater runoff.	Dredging and offsite disposal of polluted sediments if suitable disposal site is identified. Capping. Treatment of polluted sediments	\$500,000-\$5,000,000  \$500,000-\$1,000,000 \$2,500,000-50,000,000	REC 1, REC 2, MAR and EST
Lower Newport Bay,	Boat yard operations	Dredging & off-site removal Sediment removal	\$231,800	NAV, REC 1, REC 2,

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
Rhine Channel		Offsite transport Disposal in a Class I facility  Total	\$4,600,000 \$5,750,000  \$10,581,800	COMM, WILD, RARE, SPWN, MAR, SHEL
<u>McGrath Lake</u>	<u>Past and present agricultural activities</u>	<u>Dredging</u> <u>Treatment of sediments</u> <u>Source control measures</u>	<u>\$3,000,000-</u> <u>30,000,000</u> <u>\$15,000,000-</u> <u>300,000,000</u>	<u>EST</u>
Moss Landing Harbor and Tributaries	Past and present agricultural activities, River and Stream maintenance activities, ship maintenance and urban runoff.	RWQCB Program Management Control of harbor pollutants Urban runoff action plan. BMPs to reduce pollution from agriculture. Monitoring	5 Yr projected expenditures \$925,000 \$348,334 \$1,052,750  \$6,790,000 \$678,000 5 Yr. Total - \$9,794,084	NAV, SHEL, COMM, AQUA, WILD, WARM, COLD, EST BIOL, RARE, IND.
Mugu Lagoon east arm, Main Lagoon, western arm Callegas Creek Tidal Prism	Agricultural runoff, nonpoint source runoff	In situ treatment of polluted sediment  Dredging and removal of polluted sediments	Approximately.: - \$72,500,000  \$1,000,000-\$5,000,000	EST, WILD, MIGR

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
San Diego Bay, Seventh St. Channel Naval Station	Industrial Activities, <u>pesticides from lawns, streets and buildings (urban runoff)</u> , <del>and</del> runoff from pest control operations, and atmospheric fallout.	Dredging & upland disposal. Dredging \$ Contained Aquatic Disposal.	\$3,384,800-\$7,405,200  \$145,520-\$275,880	<u>MAR</u>
San Francisco Bay, Castro Cove	Refinery operations	Site investigation & feasibility study. Dredging & capping. RWQCB staff cost	\$2,000,000 \$1,000,000-20,000,000 \$200,000	EST
San Francisco Bay, Entire Bay	Mercury mining runoff and use in placer and hydraulic gold mining operations. Historic industrial use of PCBs.	Complete cleanup New Almaden Mine Point Potrero cleanup TMDLs adoption & Mercury strategy Watershed investigations to identify sources Regional Monitoring Plan studies Public education Education on source control and product substitution Total	\$10,000,000 \$800,000-3,000,000 \$10-20,000,000 \$4,000,000/5 Yrs \$75,000/yr and \$150,000/2 yrs, then \$50,000/yr \$50,000 \$25-\$45,000,000	COMM, MAR, EST, REC 1, REC 2, WILD, SHEL.
San Francisco Bay, Islais Creek	<u>Storm water or urban runoff entering directly or through</u> combined sewer overflows operated by the City and County of San Francisco. Sheet runoff	Site investigation & feasibility study Remediation including dredging with follow-up monitoring Changing operation or increase	\$1,000,000 \$800,000-\$5,200,000 \$75,000,000	EST REC 2

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
	or past discharge from auto dismantlers and metal recycling facilities. Deposition of air emissions from I-280.	storage and treatment capacity of the current system  RWQCB Staff costs	  \$100,000-\$200,000	
San Francisco Bay, Mission Creek	<u>Historic sources or storm water directly or entering by infrequent</u> combined sewer overflows operated by the City and County of San Francisco. Deposition of air emissions from I-280.	Site investigation & feasibility study Remediation including dredging/capping or off site disposal & follow-up monitoring Increase storage & structural changes  RWQCB Staff costs	\$1,000,000 \$800,000-\$1,800,000  \$75,000,000  \$100,000-\$200,000	EST, REC 1, REC 2
San Francisco Bay, Peyton Slough	Historical industrial activity associated with the creation of cinder/slag piles	Dredging, disposal and capping Follow-up monitoring RWQCB Staff costs	\$400,000 to \$1,200,000 \$5,000-\$10,000/yr \$10,000 - \$50,000	EST
San Francisco Bay, Point Potrero/ Richmond Harbor	Historical ship building and scrapping operations and metal scrap recycling operations	Remedial Action Plan Recommendations. No action Sheetpile Bulkhead, capping and institutional controls Rock Dike Bulkhead capping and institutional controls Excavation and off-site disposal Excavation reuse or disposal on site  RWQCB costs	  \$0  \$792,000  \$1,344,000 \$3,010,000 \$881,000  \$30,000/3yrs	COMM, MAR, EST, WILD, REC 1, REC 2

Site	Source	Alternative Remedial Actions	Estimated Costs to Remediate Site	Benefits of Remediation
San Francisco Bay, Stege Marsh	Oxidation of pyrite cinders in the presence of sulfides produced during industrial process. Pollutants may have also entered via urban runoff or <u>from</u> upland industrial facilities.	Site investigation & feasibility study and remediation option  RWQCB costs	\$1,500,000 to \$10,000,000  \$100,000-\$200,000	EST, WILD, RARE
San Joaquin River, City of Stockton	Low Dissolved Oxygen caused by Ammonia and BOD from the Stockton Wastewater Control Facility and surrounding point and nonpoint discharges.	TMDL development studies to achieve full compliance with water quality objectives as follows: 1. Steering committee facilitation & coordination 2. Summarize and compile data 3. Source analysis 4. Monitoring to evaluate load reduction	\$12,000  \$50,000 \$610,000 \$20,000/Yr	COMM, EST, REC 1, REC 2, WILD
Santa Monica Bay, Palos Verdes Shelf	Historical wastewater discharges from manufacturing operations and wastewater treatment plant discharges	1. Capping 7.6 Sq. Km with 45 cm isolation cap 2. Capping 7.6 Sq. Km with 15 cm isolation cap 3. Capping most polluted area 4.9 Sq. Km with 15 cm. isolation cap	\$44-\$67,000,000  \$18-\$30,000,000  \$13-\$19,000,000	MAR, COMM

TABLE 4: MITIGATION MEASURES NECESSARY TO AVOID POTENTIALLY SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS

Type of Remediation Activity	Environmental Factor	Potentially Significant Impact	Mitigation Measures
Dredging, Disposal, Capping, Confined Aquatic Disposal	Air Quality	Emissions from dredging, excavation; transport, disposal, and capping equipment	Use electric dredging equipment; purchase air credits; schedule remediation for time of year that will cause least impacts to air quality; optimize the mode of transportation to reduce air emissions; evaluate and minimize the relative impacts of hauling dredged material by alternate means; favor sites closer to dredge sites; minimize number of trips necessary to transport dredged material to disposal site or rehandling facility; meet requirements of air management plans.
Dredging, Disposal, Capping, Confined Aquatic Disposal		Potential for increased odors if dredged material is reused.	Design and locate reuse facility or other facility to remove impact.
Dredging, Disposal, Capping, Confined Aquatic Disposal	Surface Water	Short-term impact on aquatic resources from high concentrations of chemical concentrations or turbidity	Require the use of dredging equipment or operations that minimize the discharge of chemical pollutants during dredging/capping; reduce impacts by accurate positioning of disposal equipment during dredging; use silt curtains to reduce dispersal beyond dredge/excavation site; use coffer dams in small channels use large settling tanks to reduce excessive turbidity; monitor dredging and disposal activities to assess project is being implemented as authorized and whether disposal of dredged/capping material is stays within disposal area or is transported out of the disposal area.
Dredging, Disposal		Runoff from excavation or disposal above sea level	Comply with SWRCB/RWQCB storm water programs and WDRs. Construct storm water system that directs runoff away from sensitive resources and implement BMPs for improve water quality.
Capping, Confined Aquatic Disposal		Leaching of pollutants from capped area into surface sediments and	Require a monitoring program to ensure polluted sediments are placed as intended, cap material is placed correctly and the cap is effective in isolating polluted sediments.

Type of Remediation Activity	Environmental Factor	Potentially Significant Impact	Mitigation Measures
		water.	
Capping, Confined Aquatic Disposal		Changes in currents or course/direction of water movements	Removal and placement will attempt to retain regional bottom depth and contour, except where bathymetry is planned for environmental improvement.
Dredging, Disposal	Geology and groundwater	Destabilizing channel slopes and undermining pilings	Use BMPs or standard building practices to reduce instability of pilings and wharves.
		Destabilizing sediments under cap	Incorporate into design, the site depositional/erosional characteristics, current velocities, bathymetry, depth and width to contain spread of materials, etc.
Dredging, Disposal, Capping, Confined Aquatic Disposal	Biological resources	Turbidity disrupting sensitive spawning or migrating fish species or excessive turbidity caused by dredging operation threatening burial or contamination of sensitive habitats; noise, light, or traffic causing seasonal disruption to nesting birds.	See surface water mitigation for turbidity. Avoiding dredging operations during periods when species are spawning or migrating through project area; change schedule to avoid bird nesting season; operate during daylight hours; use of silt curtains to reduce dispersal of turbidity plume beyond immediate area.
Dredging, Disposal, Capping, Confined Aquatic Disposal		Sensitive species may be displaced by removing habitat or threat or burial or contamination of sensitive habitats due to	See surface water mitigation for turbidity. Any displaced habitats should be replaced nearby with equal or greater area and density. Require restoration of the site or restoration of an offshore location to mitigate for loss of intertidal habitat.

Type of Remediation Activity	Environmental Factor	Potentially Significant Impact	Mitigation Measures
		excessive turbidity caused by dredging operation.	
Dredging, Disposal, Capping, Confined Aquatic Disposal		Endangered species	For “incidental take” - habitat protection, funding to protect and/or manage habitat, training of construction/operation employees to avoid impacts, implementation of standardized avoidance measures. No project if it would result in jeopardizing continued existence of an endangered species.
Dredging, Disposal, Capping, Confined Aquatic Disposal	Transportation	Access to berths by ships or recreational boating could be altered.	Coordinate/schedule dredging disposal activities with terminal managers/harbor masters. Ensure adequate access channels are available for shipping and other harbor/bay use; operate when vessel traffic minimal; use smaller dredges.
Dredging, Disposal, Capping, Confined Aquatic Disposal	Noise	Operation of dredging operations may cause noise impacts.	Comply with local noise ordinances. Reduce or eliminate noise by using silencers or mufflers on dredging equipment. Consider use of electrical dredging equipment. Reduce noise during night hours. Use smaller dredges.
Dredging, Disposal, Capping, Confined Aquatic Disposal	Hazards and Polluted wastes	Accidental spills/releases from dredging operations	Develop procedures and requirements for loading and unloading polluted sediments to eliminate potential for spillage. Establish in cleanup plan, cleanup procedures if spillage/release occurs.
Disposal		Leaching of pollutants into groundwater.	Dry sediments in areas where impermeable liner or membrane blocks leaching.
Disposal		Disposal of polluted sediments may exceed landfill capacities or acceptance criteria.	The areal extent and volume of sediment should be characterized so realistic estimates are available to plan disposal. Reevaluate if impact still exists. Once these estimates still exceed capacities, plan for alternate use of polluted sediments to remove impact. Consider,

Type of Remediation Activity	Environmental Factor	Potentially Significant Impact	Mitigation Measures
			as appropriate, confined aquatic disposal, wetland restoration, levee reuse. Consider and mitigate site-specific impacts of other alternatives
Dredging		Dredging near former explosives disposal area - danger of injury to people, equipment, and wildlife at dredge site; danger to public due at disposal site.	Placing grate at dredge cutter head to reject large ordinance; disposal of dredge material where explosives could not cause harm; testing sediment for leakage of explosives; inspection at disposal site.
Dredging, Disposal, Capping, Confined Aquatic Disposal		Trucking hazardous or explosive wastes over bridges or through neighborhoods - possibility of fire or explosion, exclusion of hazardous waste from certain neighborhoods, inability to get bridge-crossing permits in timely manner.	Selection of feasible alternative mitigation measure such as capping, or in-situ or ex-situ treatment near dredge site.

## Findings

### *Known toxic hot spots*

Twenty-~~one~~ two high priority known toxic hot spots have been identified in the enclosed bays, estuaries and ocean waters of the State.

Planning for the remediation of these sites has been completed and incorporated into the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan.

Twenty-six moderate and low priority known toxic hot spots have been identified.

### *Scope of actions and costs*

The RWQCBs ~~has~~ have identified a number of actions to address the problems identified at each high priority known toxic hot spot. Depending on the source and areal extent of the known toxic hot spot, the actions to remediate the sites include:

- Institutional controls/education
- Better characterization of the sites and problem
- Dredging
- Capping
- A combination of dredging and capping
- Source control
- Watershed management
- Implementation of a no-action alternative

Several of the actions only work to characterize the problem at a toxic hot spot. The costs identified in these study-oriented actions do not include all actions necessary to fully remediate the toxic hot spot. Additional funds would be required to remediate these toxic hot spots after characterization studies are complete.

The estimated total cost to implement the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan ranges from ~~\$69 million to \$512 million~~ \$87.6 million to \$1.03 billion. Much of this amount is recoverable from responsible

dischargers. The unfunded portion of the cost to implement the Consolidated Plan ranges from approximately ~~\$37 to \$229 million~~ \$45.6 to \$555.29 million.

### ***Implementation/Funding Programs***

Much of the Consolidated ~~Toxic Hot Spots Cleanup~~ Plan can be implemented through existing Water Code authorities. However, no funding is identified to implement the Consolidated Plan for several high priority known toxic hot spots.

A variety of potential funding sources exist that could be used to fund portions of the cleanup plan. These funding sources include: nonpoint source grants, wetland grants, the State Revolving Fund, CALFED, Agricultural Drainage Management Loan Program, and the Cleanup and Abatement Fund. The Consolidated Plan could also be implemented by redirecting funding using Supplemental Environmental Projects or trading credits.

None of these funds or approaches, singly or in combination, can provide sufficient funding to implement the remedial actions recommended for the high priority known toxic hot spots.

### ***Need for a program to fund remediation***

The SWRCB recommends that the California Legislature consider augmenting the SWRCB budget with funds to begin implementation of the actions identified for high priority known toxic hot spots. The Legislature need not establish a new program to implement fund toxic hot spot cleanup.

Additional funding is needed to support prevention of toxic hot spots caused by or contributed to by point and nonpoint dischargers. The SWRCB and RWQCBs need additional funds to support the revision of WDRs, enforcement, compliance, storm water activities and the ~~control~~ nonpoint ~~pollution~~ sources activities to adequately implement watershed management.