

REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

REGIONAL TOXIC HOT SPOT  
CLEANUP PLAN

DECEMBER 16, 1998

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## REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

### **Part I**

#### **I. 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 ones within the bays and estuaries of the State.

This Regional Toxic Hot Spot Cleanup Plan (Cleanup Plan) is intended to provide direction for the remediation or prevention of toxic hot spots in the San Diego Region (pursuant to Water Code Sections 13390 et seq.). Pursuant to Sections 13140 and 13143 of the Water Code, this Cleanup Plan is necessary to protect the quality of waters and sediments of the State from discharges of waste, in-place sediment pollution and contamination, and any other factor that can impact beneficial uses of enclosed bays, estuaries and coastal waters.

This Cleanup Plan includes a specific definition of a toxic hot spot and site ranking criteria from the Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup Plans (Part I). In Part II of the Cleanup Plan the list of candidate toxic hot spots and the ranking matrix are presented. The last section of the Cleanup Plan contains a characterization of the high priority candidate toxic hot spots and the preliminary assessment of actions to address the problems identified at the sites.

## **Region Description**

The San Diego Region is located along the coast of the Pacific Ocean from the Mexican border to north of Laguna Beach in Orange County. 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. Weather patterns are Mediterranean in nature with an average rainfall of approximately ten inches per year occurring along the coast. Almost all of the rainfall occurs during wet cool winters. The Pacific Ocean generally has cool water temperatures due to upwelling.

The population of the Region is heavily concentrated along the coastal strip. There are coastal lagoons at river mouths to the ocean, and two dredged small craft harbors, Dana Point and Oceanside Harbor in the north part of the Region. In the southern part two harbors, Mission Bay and San Diego Bay, support major recreational vessel and ship traffic. San Diego Bay is long and narrow, 15 miles in length averaging approximately one mile across. A deep-water harbor, the 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 50 surface ships and submarines home-ported in the Bay.

## **Legislative Authority**

California Water Code, Division 7, Chapter 5.6 established a comprehensive program 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 and modified 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 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.

Water Code Section 13394 requires that each RWQCB complete a Toxic Hot Spot Cleanup Plan. Each Cleanup Plan must include: (1) a priority listing of all toxic hot spots covered by the Cleanup 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 Cleanup Plan.

### **Limitations**

This Regional Toxic Hot Spot Cleanup Plan contains information on sites that are believed to be the worst sites in the Region. The candidate toxic hot spots identified in this Cleanup Plan are not considered known toxic hot spots until approved by the State Water Resources Control Board (SWRCB) in the Consolidated Toxic Hot Spot Cleanup Plan. Many of the actions presented in this plan are general and may be specified in more detail as the actions are implemented through RWQCB actions.

## **II. TOXIC HOT SPOT DEFINITION**

### **Codified Definition of A Toxic Hot Spot**

Section 13391.5 of the Water Code defines toxic hot spots as:

"...[L]ocations 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."

## **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 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 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.

### ***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, or 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.

## **III. MONITORING APPROACH**

As part of the legislative mandates, the BPTCP has implemented regional monitoring programs to identify toxic hot spots (Water Code Section 13392.5). The BPTCP has pioneered the use of effects-based measurements of impacts in California's enclosed bays and estuaries. The Program has used a two-step process to identify toxic hot spots. The first step is to screen sites. In the second step, the highest priority sites are retested to confirm the effects. This section presents descriptions of the BPTCP monitoring objectives and sampling strategy.

## **Monitoring Program Objectives**

The four objectives of BPTCP regional monitoring are:

1. Identify locations in enclosed bays, estuaries, or the ocean that are potential or candidate toxic hot spots. Potential toxic hot spots are defined as suspect sites with existing information indicating possible impairment but without sufficient information to be classified further as a candidate toxic hot spot.
2. Determine the extent of biological impacts in portions of enclosed bays and estuaries not previously sampled (areas of unknown condition);
3. Confirm the extent of biological impacts in enclosed bays and estuaries that have been previously sampled; and
4. Assess the relationship between toxic pollutants and biological effects.

## **Sampling Strategy**

### Screening Sites and Confirming Toxic Hot Spots

In order to identify toxic hot spots a two step process was used. Both steps are designed around an approach with three measures (sediment quality triad analysis) plus an optional bioaccumulation component. The triad analysis consists of toxicity testing, benthic community analysis, and chemical analysis for metals and organic chemicals.

The first step is a screening phase that consists of measurements using toxicity tests or benthic community analysis or chemical tests or bioaccumulation data to provide sufficient information to list a site as a potential toxic hot spot or a site of concern. Sediment grain size, total organic carbon (TOC), NH<sub>3</sub> and H<sub>2</sub>S concentration are measured to differentiate pollutant effects found in screening tests from natural factors.

A positive result or an effect in any of the triad tests would trigger the confirmation step (depending on available funding). The confirmation phase consists of performing all components of the sediment quality triad: toxicity, benthic community analysis, and chemical analysis, on the previously sampled site of concern. Assessment of benthic community structure may have not been completed if there was difficulty in measuring or interpreting the information for a water body.

### **Region-Specific Modifications of the Monitoring Approach**

State Mussel Watch data should not be more than ten years old. Candidate toxic hot spot Definition 3 for toxic pollutant levels in tissues considers exceedances of U. S. Food and Drug Administration (FDA) or National Academy of Sciences (NAS) levels (above). Because tissue levels in resident edible shellfish, such as the mussel, reflect levels of chemicals found in the water column and in plankton, the San Diego Regional Board also requires mussel bioaccumulation data used to identify a toxic hot spot to be no more than ten years old. This assumption is consistent with guidance provided by the ranking criteria shown above under Definition 1 for water quality objectives. Review of State Mussel Watch data, however, did not detect exceedances of the FDA or NAS levels required under candidate toxic hot spot Definition 3.

## **IV. CRITERIA FOR RANKING TOXIC HOT SPOTS**

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>1</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”).

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<sup>1</sup> 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.

### **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.”

## V. Future Needs

Sampling information is needed to confirm whether toxic chemicals are present at sites that did not undergo repeat sampling. Follow-up information is also needed to adequately characterize toxic hot spots and sites of concern for toxic chemicals, both in the geographic area covered and by depth. Because of San Diego Regional Board experience and based on requests from industrial and government interests, it is felt new sampling trend data for the San Diego Region would be helpful to determine changes in the occurrence of toxic hot spots and sites of concern over time.

If the Regional Board cannot identify parties responsible for discharging historical chemicals such as Chlordane, DDT, PAHs, and PCBs there is a possibility the sites would not be cleaned up. There is a need, therefore, to obtain funding to clean up these “orphan” sites.

## Part II

### Candidate Toxic Hot Spot List

Water Body Name	Segment Name	Site Identification	Reason for Listing <sup>1</sup>	Pollutants Present at the Site	Report Reference
San Diego Bay	North Bay	Between "B" Street and Broadway piers, San Diego (Stations 93205, 93206)	5	PAHs, total chemistry	1
San Diego Bay	Central Bay	Switzer Creek, San Diego (Station 90039)	2	Chlordane, Lindane, DDT, total chemistry	1, 3
San Diego Bay	Central Bay	Foot of Evans and Sampson Streets, San Diego (Stations 90020, 93211)	5	PCBs, antimony, copper, total chemistry	1
San Diego Bay	Central Bay	Chollas Creek, San Diego <sup>2</sup> (Stations 90006, 93212, 93213)	5	Chlordane, total chemistry	1
San Diego Bay	Central Bay	Seventh Street Channel/Paletta Creek, Naval Station (Stations 90009, 93227, 93228)	2, 5	Chlordane, DDT, total chemistry	1

<sup>1</sup> See candidate toxic hot spot definitions on page 4: No. 2 is repeat amphipod sediment toxicity; No. 5 is multiple degraded benthic communities.

<sup>2</sup> The Chollas Creek watershed is one of two high-priority San Diego Region Total Maximum Daily Load (TMDL) projects proposed to be completed in the year 2000.

## Reference list

1. State Water Resources Control Board. 1996 *Chemistry, Toxicity and Benthic Community Conditions in Sediments of the San Diego Bay Region*. Final Report.
2. State Water Resources Control Board. 1997 *Chemistry, Toxicity and Benthic Community Conditions in Sediments of Selected Southern California Bays and Estuaries*. Final Report.
3. State Water Resources Control Board. 1998 *Chemistry, Toxicity and Benthic Community Conditions in Sediments of the San Diego Bay Region*. Addendum Report.

## Ranking Matrix

Waterbody Name	Site Identification	Human Health Impacts	Aquatic Life Impacts	Water Quality Objectives	Areal Extent	Remediation Potential	Overall Ranking
San Diego Bay	Seventh Street Channel/ Paleta Creek, National City	No action	High	No action	1 to 10 acres	High	High
San Diego Bay	Between “B” St. and Broadway piers, San Diego	No action	Moderate	No action	1 to 10 acres	High	Moderate
San Diego Bay	Switzer Creek, San Diego	No action	Moderate	No action	1 to 10 acres	High	Moderate
San Diego Bay	Foot of Evans and Sampson Streets, San Diego	No action	Moderate	No action	1 to 10 acres	High	Moderate
San Diego Bay	Chollas Creek, San Diego	No action	Moderate	No action	1 to 10 acres	High	Moderate

### **Part III**

#### High Priority Candidate Toxic Hot Spot Characterization

List for each high priority site:

- 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 RWQCB 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 to implement 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.

## High Priority Candidate Toxic Hot Spot

### **SEVENTH STREET CHANNEL, NATIONAL CITY**

#### **Assessment of the Areal Extent of the THS**

Approximately three acres appear affected (Stations 90009, 93227, 93228); however, the area affected could be substantially larger or smaller. Dredging activities could have occurred in this area since San Diego Bay was sampled during the period 1992 to 1994. If so, this area or parts of this area may no longer be considered for designation as a candidate toxic hot spot.

#### **Assessment of the Most Likely Sources of Pollutants (Potential Discharger)**

Because benthic community analysis does not directly measure cause and effect relationships between chemicals and fauna living in the sediment, it is possible that some of the degraded benthic communities could have been caused by physical disturbance of the bottom from tug and ship propellers, or from disturbance caused by recent dredging.

Persistent chemicals, such as PAHs and Chlordane, could also have caused benthic community degradation and sediment toxicity at the Seventh Street Channel. Possible sources include industrial activities, atmospheric fallout, pesticides from lawns, streets, and buildings, and runoff from pest control operations.

#### **Summary of Actions That Have Been Initiated by the RWQCB to Reduce the Accumulation of Pollutants at Existing THSs and to Prevent the Creation of New THSs**

The following programs address water quality near the Seventh Street Channel. It is unknown whether any of the organizations or facilities named below have discharged chemical wastes at levels

which could have caused the accumulation of pollutants at existing toxic hot spots.

NPDES Permits for the Naval Station. The Naval Station Graving Dock, which lies midway between Chollas Creek and the Seventh Street Channel and a half mile north of the Seventh Street Channel, currently is covered by its own National Pollutant Discharge Elimination System (NPDES) permit. Discharges from Navy industrial facilities are currently covered under the State Water Resources Control Board General Industrial Storm Water Permit. The Regional Board may issue NPDES permits for discharges from other Navy activities adjacent to San Diego Bay.

NPDES Municipal Storm Water Permit. In 1990, the Regional Board issued NPDES storm water permits to municipalities responsible for civilian areas, including those tributary to San Diego Bay. Activities underway in the Paleta Creek watershed by the City of National City include public education, public service announcements on television, and street sweeping. The storm water permit is now being revised.

Pacific Steel site. During the 1980s, the Regional Board took enforcement action against Pacific Steel, an automobile recycler. The company, which was located inland of the Seventh Street Channel, maintained a large “fluff” pile of non-ferrous waste. Runoff from the fluff pile was prohibited by the Regional Board from draining to San Diego Bay. The fluff pile was subsequently removed and the site cleaned up.

Military cleanups. The Regional Board has participated in Department of Defense Environmental Response Program (DERP) and Navy Installation Restoration (IR) activities to close former military hazardous waste sites on land adjacent to the Bay. Several disposal sites are located around the Seventh Street Channel.

## **Preliminary Assessment of Actions Required to Remedy or Restore a THS to an Unpolluted Condition Including Recommendations for Remedial Actions**

The following discussion applies only to the limited area of three acres estimated to be contaminated. It is possible that a larger or smaller area could have been contaminated by industrial wastes.

Section 13360 of the Porter-Cologne Water Quality Control Act prohibits regional boards, the State Board, and the courts from designating the means of compliance with the California Water Code. For this reason, the options presented below are not meant to influence the ultimate solution, but are presented to comply with Bay Protection and Toxic Cleanup Program legislative requirements and to provide a starting point for discussion. The Regional Board could require potential responsible parties to submit CWC Section 13267 technical reports documenting the amounts and types of wastes discharged.

Regional Board procedures. A first step could be to convene a meeting between potential responsible parties to discuss the data and to receive comments and information about the site. After review by staff of available information, the Regional Board Executive Officer could ask potential dischargers to submit technical reports. Subsequently, the Board could require potential responsible parties to sample the site and surrounding area to document in detail the areal extent of the site and to identify specific pollutants at the site. Only after extensive review of all available information would the Regional Board require remediation actions.

Persistence of wastes at this site. The chemical wastes found in the Seventh Street Channel and at the mouth of Paleta Creek, the pesticides Chlordane and DDT, and the class of polynuclear aromatic hydrocarbon (PAH) “ring” compounds derived from fossil fuels, are known to persist in nature. These organic chemicals may be resistant to treatment or natural remediation processes such as oxidation,

microbial degradation, and photolysis. For this reason, natural recovery or in situ treatment may not be feasible. In-place capping is presumed to be infeasible because of frequent vessel traffic in this area of the Bay. Two options which may be feasible are dredging followed by placement in an upland confined disposal facility, and dredging followed by contained aquatic disposal. There is precedent for both options in San Diego Bay. Dredging of contaminated bottom material has occurred at boat yards in north San Diego Bay and at the 24th Marine Terminal in the south Bay. A submerged aquatic disposal site has been completed in the north Bay off several storm drains known to have contributed PCBs to the Bay.

Dredging and upland disposal. Stations 90009, 93227, and 93228 are located in a heavily-used dredged channel frequented by barges, boats, and tugs. Navigation charts show depths of between 18 to 21 feet at mean lower low water, although the depths may be shallower or deeper due to sedimentation or recent dredging. There may be suitable sites on land nearby to build settling ponds to receive hydraulic dredge spoils. Sediment removal activities could include clamshell dredging or hydraulic dredging, and transportation to a suitable disposal site by barge, rail, or truck, or to settling ponds next to the Channel.

Dredging and contained aquatic disposal. Another method could involve dredging a disposal site at another location in San Diego Bay, depositing the contaminated dredge spoil from the candidate toxic hot spot site, and capping the site with suitable material. The following conditions would have to be met if this option were to be implemented:

- Clean Water Act Section 404 dredging permits would be obtained from the U.S. Army Corps of Engineers for the contaminated site and for the aquatic disposal site
- State waste discharge requirements would be obtained from the Regional Board for the disposal site

- The cap would provide adequate coverage to prevent the spread of contaminated material
- Burrowing organisms would be prevented from mixing polluted sediments (i.e., bioturbation must not occur)
- The contaminated material covered would be able to support the cap
- The bottom slope would be able to support the cap during seismic events
- The cap would be well marked and protected against erosion or destruction from anchors, propellers, and strikes by vessels
- The site would be located away from major navigation lanes
- The exact location of the site would be noted on maps, charts, and deeds

## **Estimate of the Total Cost to Implement the Cleanup Plan**

This preliminary cost list is based on the schedule found in the 1997 guidance document. High and low costs are provided. It is assumed that if ocean disposal at the 100 fathom site is chosen, the U.S. Army Corps of Engineers would require extensive testing of the material removed from the Seventh Street Channel to be transported to the LA-5 site 6 miles from Pt. Loma. Costs were not able to be estimated for California Environmental Quality Act (CEQA) compliance, Section 404 dredging permit and state waste discharge requirements acquisition, or sampling to determine the areal extent of the candidate toxic hot spot.

Costs for dredging and upland disposal. High costs: Assume that 14,520 square yards (three acres) need remediation and that sediment to a depth of one yard would be removed. The 14,520 cubic yards of dredge spoil would then be placed on a barge, offloaded onto trucks, and transported to a suitable upland landfill. Low costs: Assume that the wastes are transported to a Class III site.

Comparison of High and Low Costs  
for Dredging and Upland Disposal

High Cost per Cubic Yard		Low Cost per Cubic Yard	
Clamshell dredging	\$10	Clamshell dredging	\$10
Unloading from barge	TBD	Unloading from barge	TBD
Transport by truck	200	Transport by truck	200
Disposal at Class I site	300	Disposal at Class III site	30
Sub total per cubic yard	\$510	Sub total per cubic yard	\$240
14,520 cubic yards X \$510 = \$7,405,200 (not including permits)		14,520 cubic yards X \$240 = \$3,384,800 (not including permits)	

Costs for dredging and contained aquatic disposal. High costs: Assume that 14,520 square yards (three acres) need remediation and that sediment to a depth of one yard would be removed. An aquatic disposal site would be dredged and suitable material obtained for use as a cap. Another suitable cap to prevent burrowing animals from penetrating into the underlying contaminated sediment would be provided as well. The 14,520 cubic yards of dredge spoil would be placed on a barge and transported to the aquatic disposal site. The caps would then be constructed. Low costs: Assume that confinement at the disposal site is not necessary.

Comparison of High and Low Costs for  
Dredging and Contained Aquatic Disposal

High Cost per Cubic Yard		Low Cost per Cubic Yard	
Excavation of disposal site	TBD	Clamshell dredging and disposal (assuming confined disposal is not needed)	\$10
Clamshell dredging	\$10		
Barge transport of waste (assume high truck costs)	TBD		
Disposal at aquatic site	9		
Cap at disposal site	TBD		
Monitoring at disposal site	TBD		
Sub total per cubic yard	\$19	Sub total per cubic yard	\$10
14,520 cubic yards X \$19 = \$275,880 total (not including creating and maintaining disposal site or acquiring permits)		14,520 cubic yards X \$10 = \$145,520 total (assuming a confined site is not needed)	

**Estimate of Recoverable Costs From Potential Dischargers**

No attempt has been made to ask potential responsible parties to participate in any remediation activities, so projected participation by responsible parties is based on conjecture. If fifty percent of the costs were recovered and the cleanup were to cost \$7.4 million, the following schedule may be possible. Assume that \$3.7 million is not recoverable.

**Two-Year Expenditure Schedule Identifying Funds to Implement the Plans That Are Not Recoverable From**

## Potential Dischargers

Assume that a total of more than \$3.7 million would be needed, and that more than two years would be needed to remediate the Seventh Street Channel site.

### Activity

### Deficit

#### Year 1:

- Meeting with responsible parties
- Request for technical information
- Discharger response
- Staff review of response
- Cleanup and abatement order
- Sampling plan to characterize aerial extent
- Request for bids for chemistry sampling and analysis
- Lab contract

estimate      \$800,000

#### Year 2:

- Site characterization
- Engineering report
- Section 404 dredging permit application
- State waste discharge requirements application
- NEPA and CEQA environmental documentation

estimate      \$900,000

## **APPENDIX A**

### **ENVIRONMENTAL CHECKLIST**

The following Environmental Checklist addresses effects from implementation of the Cleanup Plan. Adoption of the Plan by the San Diego Regional Board would not, in itself, cause significant environmental impacts. Cleanup actions should be carried out so that mitigation measures would not be needed.

## ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. <u>LAND USE AND PLANNING.</u></b>				
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]
<b>II. <u>POPULATION AND HOUSING.</u></b>				
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]
<b>III. <u>GEOLOGIC PROBLEMS</u></b>				
Would the proposal result in or expose people to potential impacts involving:				
a. Fault rupture?	[ ]	[ ]	[ ]	[X]
b. Seismic ground shaking?	[ ]	[ ]	[ ]	[X]

Appendix A, continued

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Seismic ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Seiche, tsunami, or volcanic hazard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Landslides or mudflows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Erosion, changes in topography or unstable soil conditions from excavation, grading or fill?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Subsidence of the land?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Expansive soils?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Unique geologic or physical features?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>IV. <u>WATER</u></b>				
Would the proposal result in:				
a. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Exposure of people or property to water related hazards such as flooding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Discharge into surface water or other alteration of surface water quality (e.g. temperature, dissolved oxygen or turbidity)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Changes in the amount of surface water in any water body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Changes in currents or the course or direction of surface water movements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Altered direction or rate of flow of ground water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Impacts to ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Substantial reduction in the amount of ground water otherwise available for public water supplies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix A, continued

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>V. <u>AIR QUALITY</u></b>				
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]	[ ]
<b>VI. <u>TRANSPORTATION/CIRCULATION</u></b>				
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]
<b>VII. <u>BIOLOGICAL RESOURCES</u></b>				
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] <sup>1</sup>	[ ]
b. Locally designated species?	[ ]	[ ]	[X] <sup>1</sup>	[ ]
c. Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)?	[ ]	[ ]	[ ]	[X]

Appendix A, continued

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Wetland habitat (e.g. marsh, riparian and vernal pool)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Wildlife dispersal or migration corridors?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>1</sup>	<input type="checkbox"/>
<b>VIII. ENERGY AND MINERAL RESOURCES</b>				
Would the proposal:				
a. Conflict with adopted energy conservation plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Use non-renewable resources in a wasteful and inefficient manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>IX. HAZARDS</b>				
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Possible interference with an emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. The creation of any health hazard or potential health hazard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Exposure of people to existing sources of potential health hazards?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Increased fire hazard in areas with flammable brush, grass, or trees?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>X. NOISE</b>				
Would the proposal result in:				
a. Increases in existing noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Exposure of people to severe noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XI. PUBLIC SERVICES</b>				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix A, continued

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Maintenance of public facilities, including roads?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Other governmental services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XII. UTILITIES AND SERVICE SYSTEMS</b>				
Would the proposal result in a need for new systems or supplies or substantial alterations to the following utilities:				
a. Power or natural gas?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Communications systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Local or regional water treatment or distribution facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Sewer or septic tanks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Storm water drainage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Solid waste disposal?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Local or regional water supplies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIII. AESTHETICS</b>				
Would the proposal:				
a. Affect a scenic vista or scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Have a demonstrable negative aesthetic effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Create light or glare?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIV. CULTURAL RESOURCES</b>				
Would the proposal:				
a. Disturb paleontological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Disturb archaeological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Affect historical resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Have the potential to cause a physical change which would affect unique ethnic cultural values?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Restrict existing religious or sacred uses within the potential impact area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Appendix A, continued

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XV. RECREATION</b>				
Would the proposal:				
a. Increase the demand for neighborhood or regional parks or other recreational facilities?	[ ]	[ ]	[ ]	[X]
b. Affect existing recreational opportunities?	[ ]	[ ]	[ ]	[X]
<b>XVI. MANDATORY FINDINGS OF SIGNIFICANCE</b>				
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] <sup>1</sup>	[ ]
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**

I find that the Regional Toxic Hot Spot Cleanup Plan for the San Diego Region will not have a significant adverse effect on the environment.

\_\_\_\_\_  
Date

\_\_\_\_\_  
John H. Robertus, Executive Officer  
California Regional Water Quality Control Board  
San Diego Region

ENVIRONMENTAL CHECKLIST

**COMMENTS ON “LESS THAN SIGNIFICANT IMPACT” ISSUES  
FOR THE REGIONAL TOXIC HOT SPOT CLEANUP PLAN  
FOR THE SAN DIEGO REGION**

- IV. c. Dredging and capping operations could cause short-term disruptions such as a reduction in dissolved oxygen levels. As the dredge material is removed or new material placed, the bottom sands and muds should return to normal oxygen saturation.
- IV. e. Changes in bottom contours brought about by dredging or capping would probably have minimal effects on water circulation because of the relatively small area under consideration for modification.
- V. a. Increased discharge rates from diesel engines powering tugs, cranes, and dredging equipment would be temporary. By limiting the size of the operation, air quality standards could be met.
- V. d. The release of hydrogen sulfide could cause objectionable odors. Increased discharge rates of sulfide odors should be temporary and located in industrial areas.
- VI. a. The project could cause temporary small increases in vehicle traffic congestion, probably away from the dredge or capping site. By limiting the size of the operation, vehicle disruptions could be minimized.
- VI. f. The project could cause temporary disruption in civilian and military vessel traffic. By limiting the size of the operation, disruptions to vessel traffic could be minimized.
- VII. a, e. There may be nesting and feeding areas of the endangered California least tern which could be disrupted by dredging and capping operations. By limiting the size of the operation and scheduling dredging and capping operations to periods when the birds do not nest, disruptions to the birds could be minimized.<sup>1</sup>

Appendix A, continued

- IX. a. Possible releases of oil or pesticides, such as Chlordane and DDT, could result from dredging the Seventh Street Channel and other sites. The site characterization phase should contain provision for sampling to determine the chemical encountered and the projected release rates from such dredging. A decision about whether to dredge the site should be made after a site characterization has been made. Military explosive ordnance could also be entrained by the dredge. Provisions should be made to manage the possibility of accidental explosions or chemical releases at the site, during transport, and at the disposal or storage site.
- X. a. Temporary increases in noise levels could result from dredging or capping operations. By limiting the size of the operation and scheduling the operation during the day, such disruptions could be minimized.
- XII. a., b. The locations of cable and pipeline crossings should be noted and taken into account to avoid disruptions to utilities and service systems. Rerouting of these systems may be necessary if dredging or capping operations occur in the area.
- XII. f. Solid waste disposal capacity of upland disposal sites may be diminished if dredge material is taken to these facilities. Cleanup and mitigation activities should take into account the need to dispose of dredge material at these sites.
- XIII. c. Dredging and capping operations could result in temporary disruptions caused by floodlights if operations occur at night. By limiting the size of the operation and scheduling disruptive activities during the day, such problems could be minimized.
- XVI. a. There is a possibility that the quality of the environment could be temporarily degraded and that there could be effects on endangered species if cleanup and mitigation projects are not carefully planned and executed.<sup>1</sup>
- XVI. d. There is a possibility that the quality of the human environment could be temporarily degraded and that there could be temporary annoyances if cleanup and mitigation projects are not carefully planned and executed.

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<sup>1</sup> The Department of Fish and Game performed a California Endangered Species Act consultation during December 1998.

## **APPENDIX B**

### **BENEFICIAL EFFECTS OF REMEDIATION**

The following list of Beneficial Effects of Remediation addresses possible effects from implementation of the Cleanup Plan. Adoption of the Plan by the San Diego Regional Board would not, in itself, produce beneficial effects. Cleanup actions should be carried out so that mitigation measures would not be needed.

## BENEFICIAL EFFECTS OF REMEDIATION

Beneficial Effect	Values Quantifying These Beneficial Effects	Beneficial Uses <sup>1</sup> Affected
1. Lower toxicity in benthic organisms.	Greater survival of organisms in toxicity tests.	MAR, EST
2. Undegraded benthic community.	Species diversity and abundance characteristic of undegraded condition.	MAR, EST
3. 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
4. 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
5. 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
6. 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
7. Improved conditions for seabirds and other predators.	Increase in populations. Value to public of more abundant wildlife.	WILD, MIGR, RARE
8. More abundant fish populations.	Increase in populations. Value to public of more abundant wildlife.	MAR, EST
9. Commercial catches increase.	Impact on catches and net revenues of fishing operations.	COMM
10. Recreational catches increase.	Impact on catches and recreational visitor days.	REC 1
11. Improved ecosystem conditions.	Species diversity and abundance characteristic of undegraded conditions.	EST, MAR
12. Improved aesthetics.	Value to public of improved aesthetics. In some cases, estimates of value to the public of improved conditions may be available from surveys.	REC 2
13. More abundant wildlife, more opportunities for wildlife viewing.	Impact on wildlife populations. Impact on recreational visitor-days.	MAR, WILD, RARE, REC 2

## COMMENTS ON BENEFITS OF REMEDIATION

EFFECT	COMMENT
1, 2, 11	<p><u>Lower toxicity and more diverse benthic communities could benefit ecological communities.</u> According to the Edward Long of the National Oceanic and Atmospheric Administration, San Diego Bay ranks as having the second highest spatial extent of amphipod sediment toxicity out of 18 bays sampled <sup>2</sup>. Removal of sediment contamination in conjunction with cessation of discharge of chemical waste should therefore have a greater effect than removal of chemicals from less-polluted bays. However, it may be difficult to measure the beneficial effects of remediation in several San Diego Bay industrial areas because of heavy tug and ship traffic which could disrupt bottom communities. These physical disruptions could mimic the effects of chemical disruptions.</p>
3, 4	<p><u>An important step to reduce the effects of pollutants on humans who consume fish taken from bays is to reduce the concentrations of pollutants in the fish.</u> In some areas, San Diego Bay contains high levels of persistent toxic chemicals in sediment such as Chlordane and DDT. The County of San Diego and the Port of San Diego carried out a human health risk assessment project during the early 1990s. This project focused on fish tissue levels of persistent chemicals. Subsequent sampling could occur to measure reductions of chemicals in fish tissue consumed by humans. It may take some time, however, for reduced concentrations of pollutants in water, fish, and shellfish to be observed.</p>
5, 6, 7, 8, 9, 10, 13	<p><u>Bays and estuaries in the San Diego Region provide valuable nursery areas for fish, and nesting and feeding areas for birds and wildlife.</u> Recreational fishing occurs in small harbors, some coastal lagoons, and bays. Except for the mullet fishery in the south Bay, San Diego Bay has been set aside as a sport fishing bay by the California Fish and Game Commission. The San Diego County Department of Environmental Health has identified diverse fish species consumed by certain ethnic groups. Increases in populations of shellfish, fish, birds, and wildlife could take years to observe, however.</p>
12	<p><u>Improved aesthetics are important for the lagoons, small harbors, and San Diego Bay.</u> Several lagoons and bays have wildlife viewing parks and trails. With 50,000 registered boats in San Diego County and many more in Orange County, clean water, free from fish kills and obvious contamination, becomes important both aesthetically and monetarily. An important hotel, convention, and visitors industry is located around San Diego and Mission Bays.</p>

Appendix B, continued

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<sup>1</sup> See the current *Water Quality Control Plan for the San Diego Basin (9)* for descriptions of beneficial uses

<sup>2</sup> Long ER et al. 1996. Estimates of the spatial extent of sediment contamination in major US estuaries. *Environ. Sci. Technol.* 30:3585-3592.

## APPENDIX C

### SITES OF CONCERN

The stations on the sites of concern list demonstrated biological degradation associated with elevated chemistry but did not qualify as toxic hot spots under the definitions found in the State Board's September 1998 *Water Quality Control Policy for Guidance on Development of Regional Toxic Hot Spot Cleanup Plans*. It was the consensus of the Bay Protection Program's Monitoring and Surveillance Task Force that sites which could eventually qualify as toxic hot spots also be identified.

Criteria for identifying the sites of concern in the San Diego Region are presented in the Regional Board's decision matrix tables used to identify toxic hot spots. The sites of concern presented in the San Diego Region Cleanup Plan fall into two categories:

1. "High-priority" stations recommended by the Department of Fish and Game in technical reports for the San Diego Region
2. Stations with at least one "triad" biological hit with elevated chemistry sampled on the same date as the biological hits under definitions 2 and 5 of the State Board's Policy

Appendix C, continued

Sites of Concern (Sites that do not qualify as Candidate Toxic Hot Spots)

Water Body Name	Segment Name	Site Identification	Reason for Listing	Pollutants Present at the Site	Report Reference
<b>Stations with single biologic triad hits and associated chemistry:</b>					
Mission Bay	Northeast Bay	Rose Creek, San Diego (Station 93107)	Degraded benthic community	Chlordane, total chemistry	1
San Diego River	Flood control channel	Sunset Cliffs Bridge, San Diego (Station 93116)	Degraded benthic community	Chlordane	1
San Diego Bay	North Bay	Submarine Base, Ballast Point, San Diego (Station 90028)	Degraded benthic community	PAH	1
	North Bay	Laurel Street, San Diego (Station 90002) <sup>1</sup>	Sediment toxicity, degraded benthic community	Chlordane, total chemistry	1
San Diego Bay	Central Bay	Near Coronado Bridge, San Diego (Station 93179) <sup>1</sup>	Sediment toxicity	PCB, PAH, total chemistry	1, 3
San Diego Bay	Central Bay	Indian Point, south of Coronado Bridge, San Diego (Station 90030)	Sediment toxicity	PAH, total chemistry	1

continued

Appendix C, Sites of Concern, continued

Water body name	Segment Name	Site Identification	Reason for Listing	Pollutants present at the site	Report reference
San Diego Bay	Central Bay	26th Street, San Diego (Station 93181)	Sediment chemistry	Total chemistry	1
San Diego Bay	Central Bay	Between Piers 3 and 4, Naval Station (Station 93223)	Degraded benthic community	Total chemistry	1
San Diego Bay	Central Bay	Between Piers 3 and 4, Naval Station (Station 90007)	Sediment toxicity	Mercury	1
San Diego Bay	Central Bay	Between Piers 3 and 4, Naval Station (Station 93224)	Degraded benthic community	Zinc	1
San Diego Bay	Central Bay	Between Piers 5 and 6, Naval Station (Station 90022)	Sediment toxicity, degraded benthic community	PAH, total chemistry	1
San Diego Bay	Central Bay	South of Pier 14 Naval Station (Station 93229)	Degraded benthic community	PAH	1
San Diego Bay	Central Bay	26th Street, San Diego (Station 93181)	Sediment chemistry	Total chemistry	1
Tijuana Estuary	North slough	El Centro Street, National Wildlife Refuge, Imperial Beach (Station 93118)	Sediment toxicity	DDE	1
Tijuana Estuary	North slough	Boundary Road islands, National Wildlife Refuge, Imperial Beach (Station 93119)	Sediment toxicity	DDE, DDT	1

continued

Appendix C, Sites of Concern, continued

Water body name	Segment Name	Site Identification	Reason for Listing	Pollutants present at the site	Report reference
Tijuana Estuary	South slough	South of Tijuana River mouth, National Wildlife Refuge, Imperial Beach (Station 93175)	Sediment toxicity	DDE, DDT	1
Tijuana Estuary	South slough	North boundary of Border Field State Park, Imperial Beach (Station 93174)	Sediment toxicity	DDE, DDT	1
<b>Stations with single biologic triad hits but without “threshold” levels of elevated chemistry:</b>					
Dana Point Harbor	East basin	Central harbor south, Dana Point (Station 96016) <sup>1</sup>	Degraded benthic community (and urchin fertilization effects)	(Copper TBT, Chlordane) <sup>2</sup>	2

continued

Appendix C, Sites of Concern, continued

Water body name	Segment Name	Site Identification	Reason for Listing	Pollutants present at the site	Report reference
San Dieguito Lagoon	Southeastern slough	Fish hook slough, Del Mar (Station 95024) <sup>1</sup>	Sediment toxicity, degraded benthic community (and urchin fertilization effects)	(Dieldrin) <sup>2</sup>	2

<sup>1</sup> Department of Fish and Game high-priority stations

<sup>2</sup> Chemicals present at the station but below threshold levels triggering an “elevated chemistry” designation

Reference list

1. State Water Resources Control Board. 1996 *Chemistry, Toxicity and Benthic Community Conditions in Sediments of the San Diego Bay Region*. Final Report.
2. State Water Resources Control Board. 1997 *Chemistry, Toxicity and Benthic Community Conditions in Sediments of Selected Southern California Bays and Estuaries*. Final Report.
3. State Water Resources Control Board. 1998 *Chemistry, Toxicity and Benthic Community Conditions in Sediments of the San Diego Bay Region*. Addendum Report.