REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TOXIC HOT SPOT CLEANUP PLANS FOR B STREET/BROADWAY PIERS, SWITZER CREEK, FOOT OF EVANS/SAMPSON STREETS, AND CHOLLAS CREEK IN SAN DIEGO BAY

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Toxic Hot Spot Cleanup Plans for B Street/Broadway Piers, Switzer Creek, Foot of Evans/Sampson Streets, and Chollas Creek in San Diego Bay

Background

The California Legislature in 1989 established the Bay Protection and Toxic Cleanup Program with 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; and (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 bays and estuaries of the State.

This addition to the December 1998 *Regional Toxic Hot Spot Cleanup Plan* for the San Diego Region (Cleanup Plan), since incorporated into the 1999 *Consolidated Toxic Hot Spot Cleanup Plan* for California of the State Water Resources Control Board (State Board), is intended to provide direction for the San Diego Region to remediate and protect or prevent the creation of toxic hot spots (pursuant to Water Code Sections 13390 et seq.). Under Sections 13140 and 13143, the additions to the San Diego Region's Cleanup Plan are necessary to protect waters and sediments of the State from discharges of waste, in-place sediment pollution and contamination, and any other factor that can negatively affect beneficial uses of enclosed bays, estuaries, and coastal waters.

Table 1 presents a list of toxic hot spots identified in the December 1998 Cleanup Plan. The list was approved by the State Board and included in the 1999 Consolidated Plan.

Table 1
List of Toxic Hot Spots in the San Diego Region

Priority	Site	Reason for Listing	Pollutants Present at the Site
Moderate	Between B Street and Broadway piers, San Diego	Multiple degraded benthic communities, elevated chemistry	PAHs, total chemistry
Moderate	Switzer Creek, San Diego	Toxicity, elevated chemistry	Chlordane, Lindane, DDT, total chemistry
Moderate	Evans and Sampson Streets, San Diego	Multiple degraded benthic communities, elevated chemistry	PCBs, antimony, copper, total chemistry
Moderate	Chollas Creek, San Diego	Multiple degraded benthic communities, elevated chemistry	Chlordane, total chemistry
High	Seventh Street channel/Paleta Creek, National City	Toxicity, elevated chemistry, multiple degraded benthic communities	Chlordane, DDT, total chemistry

Cleanup plans for the four moderate-priority toxic hot spots were not required under the State Board's *Water Quality Control Policy for Guidance on the Development of Regional Toxic Hot Spot Cleanup Plans*; however, wording was inserted in the Consolidated Cleanup Plan by the State Water Resources Control Board at the June 17, 1999 Bay Protection and Toxic Cleanup Program hearing. The final state plan requires individual cleanup plans in San Diego Region for moderate-priority hot spots to be submitted to the State Board by June 16, 2000. The San Diego Region is the only region being required to submit plans for moderate-priority sites.

The State Board issued this statement accompanying the Consolidated Plan:

> ***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.

To comply with the State Board's requirements, the following cleanup plans are submitted. For consistency, the template used by the State Board for regional cleanup plans was used as much as possible. These cleanup plans are submitted as additions to the December 16, 1998 Regional Toxic Hot Spot Cleanup Plan but they do not modify the State Board's June 1999 Consolidated Toxic Hot Spot Cleanup Plan. The cleanup plans should not be considered complete, as they are based only on the results of sampling at one, two, or three stations. Further site evaluation will be needed to determine actual chemicals of concern, area of concern, and cleanup methods. The cleanup plans required by the State Board are presented below.

Moderate-Priority Candidate Toxic Hot Spot Characterizations

A. An Assessment of the Areal Extents of the Moderate-Priority Toxic Hot Spots

The area of the hot spots cannot be known with accuracy due to the limited amount of Bay Protection Program sampling data available. For consistency with the December 1998 regional cleanup plan the same methods are used to estimate the extent of the toxic hot spots. One acre, the minimum unit of measurement of the area of hot spots used in the State Board's Guidance, is assigned for each station used in defining the hot spot. For example, if three stations were involved in defining a hot spot, the area is assumed to be three acres in size. Subsequent sampling will be necessary to define the actual area in need of cleanup. Also, dredging activities could have occurred in vicinity of the hot spots since San Diego Bay was sampled during the period 1992 to 1996. Table 2 shows the approximate areal extent of each of the four sites using the method described here.

Table 2
Approximate Areas of Four Moderate-Priority Toxic Hot Spots Located in San Diego Bay

Site	Stations Involved	Approximate Area (Acres)
Between B Street and Broadway Piers	93205 93206	2
Mouth of Switzer Creek	90039	1
Foot of Evans and Sampson Streets	90020 93211	2
Mouth of Chollas Creek	90006 93212 93213	3

B. An Assessment of the Most Likely Sources of Pollutants (Potential Dischargers)

Because benthic community analysis does not directly measure cause and effect 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 could also have caused benthic community degradation and sediment toxicity at the hot spots. Toxicity and benthic community degradation could be caused by the presence of industrial wastes discharged from shore-side facilities. Shipyards typically generate wastes containing heavy metals, such as copper and zinc.

Electrical transformers and welding activities found at shore-side facilities contain polychlorinated biphenyls (PCBs), and fuel spills and bilge water from ships may contain polynuclear aromatic hydrocarbons (PAHs).

Possible upland activities which could have resulted in discharges of chemical waste in urban runoff from the watershed, include atmospheric fallout of PAHs, pesticides from lawns, streets, and buildings, and runoff from pest control operations.

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

The following programs address water quality near the hot spots. It is unknown whether any organizations or facilities named below have discharged chemical wastes which have resulted in the accumulation of pollutants at existing toxic hot spots or at new toxic hot spots.

NPDES permits for industrial facilities located next to the Bay. Clean Water Act National Pollutant Discharge Elimination System (NPDES) permits have at one time or another been in force at the Campbell shipyard, Continental Maritime shipyard, Kelco kelp-processing plant, San Diego Gas and Electric Co. Silvergate Power Plant, Southwest Marine shipyard, and the National Steel Shipbuilding (NASSCO) shipyard.

Naval Station Graving Dock. The graving dock, which lies several piers south of Chollas Creek, currently is covered by its own NPDES permit. Discharges from U.S. Navy industrial facilities are currently covered under the State Water Resources Control Board General Industrial Storm Water Permit. The Regional Board may issue an NPDES

permit for discharges from other Navy activities on and 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 watershed by the City of San Diego include public education, public service announcements on television, and street sweeping. The storm water permit is now being revised.

TMDL projects at Chollas Creek. Total Maximum Daily Load efforts are underway by the Regional Board under Clean Water Act Section 303(d). Creek water has been sampled and evaluated by the Regional Board and the Southern California Coastal Water Research Project (SCCWRP) for toxicity. A Toxicity Identification Evaluation (TIE) determined that Diazinon, and to a lesser extent, Dursban (chlorpyrifos) are responsible for increasing toxicity in the water column. Another TIE performed by SCCWRP identified copper and zinc as causing toxicity in the Creek. A subsequent TMDL will be performed at the mouth of Chollas Creek to evaluate reasons for the presence of the toxic hot spot.

D. Preliminary Assessment of Actions Required to Remedy or Restore Toxic Hot Spots to an Unpolluted Condition Including Recommendations for Remedial Actions

The following discussion only applies to the limited area estimated to be contaminated. It is possible that a larger or smaller area could have been contaminated by industrial wastes or by urban runoff. Further sampling will be needed to determine the actual area and depth of contamination.

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. An action required by the Board could be to require potential responsible parties to submit California Water Code Section 13267 technical reports documenting the amounts and types of wastes discharged.

Regional Board procedures. A possible 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. The chemical wastes found at the four moderate-priority hot spots include the pesticides Chlordane, Lindane, and DDT; the class of polynuclear aromatic hydrocarbon (PAH) "ring" compounds derived from fossil fuels known to be persistent in nature; and the metals antimony and copper. Some of the 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. However, complexes with humic materials found in bottom

sediment may tie up metals in insoluble chemical forms and therefore make them unavailable to be taken up into the tissues of shellfish and fish.

Two options which may be feasible include 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 Street Marine Terminal in the south Bay. Submerged aquatic disposal sites have been completed at two locations: in the north Bay off several storm drains known to have contributed PCBs to the Bay, and at the North Island Naval Air Station.

Dredging and upland disposal. There may be suitable sites on land nearby able to receive hydraulic dredge spoils and to contain settling ponds. Therefore, the options for sediment removal include clamshell dredging or hydraulic dredging, and transportation to a suitable disposal site by barge, rail, or truck, or via pipelines 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 clean sand. The following conditions would have to be met if this option were to be implemented:

- Clean Water Act Section 404 dredging permits would have to 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 have to be obtained from the Regional Board for the disposal site

- The cap would provide adequate coverage to prevent spread of contaminated material
- Burrowing organisms would be prevented from mixing polluted sediments (i.e., bioturbation must not occur)
- The 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
- California Environmental Quality Act (CEQA) review would be necessary

E. An Estimate of the Total Costs to Implement the Cleanup Plan

This preliminary cost list is based on the schedule found in the 1998 Guidance document. High and low costs per cubic yard of bottom material for cleanup are provided in Table 3. Table 4 presents approximate costs for the four moderate-priority hot spots. It is assumed that the U.S. Army Corps of Engineers would require extensive testing of contaminated dredged material if the LA-5 site, located six miles from Pt. Loma, were chosen for disposal. Costs were not able to be estimated for California Environmental Quality Act (CEQA) compliance, federal Clean Water Act 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. The following cost estimates are not based on hard evidence, but are provided for discussion only.

High costs: Assume that sediment to a depth of one yard would have to be removed. The dredge spoil would then be placed on a barge, loaded onto trucks, and transported to a suitable upland landfill**.**

Low costs: Assume that the wastes are transported to a Class III site.

Table 3
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
Total per cubic yard	$510	Total per cubic yard	$240

Table 4
Cost Estimates for Dredging
Moderate-Priority Toxic Hot Spots

Site	Size in Acres	High Costs	Low Costs
Between B Street and Broadway Piers	2	$4,936,800	$2,323,200
Mouth of Switzer Creek	1	$2,468,400	$1,161,600
Foot of Evans and Sampson Streets	2	$4,936,800	$2,323,200
Mouth of Chollas Creek	3	$7,405,200	$3,484,800

Costs for dredging and contained aquatic disposal

High costs: Assume that sediment to a depth of one yard would have to be removed. An aquatic disposal site would have to be dredged and clean sand obtained for use as a cap. Another suitable cap to prevent burrowing animals from penetrating the cap would have to be provided as well. The dredge spoil would be placed on a barge and transported to the aquatic disposal site. The cap would then be constructed.

Low costs: Assume that confinement at the disposal site is not necessary.

Table 5 presents costs for the capping alternatives. Table 6 presents approximate costs to cap the four moderate-priority hot spots.

Table 5
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

Table 6
Cost Estimates for Capping the Four Moderate-Priority Toxic Hot Spots

Site	Size in Acres	High Costs	Low Costs
Between B Street and Broadway Piers	2	$183,920	$96,800
Mouth of Switzer Creek	1	$91,960	$48,400
Foot of Evans and Sampson Streets	2	$183,920	$96,800
Mouth of Chollas Creek	3	$2,904,400	$145,200

F. An Estimate of Recoverable Costs from Potential Dischargers

No attempt has been made to ask potential responsible parties to participate in any remediation activities, so estimates shown here are based on conjecture. Table 7 shows estimates for recoverable costs assuming a fifty-percent recovery rate.

Table 7
Estimates of Recoverable Costs From Potential Dischargers Assuming a Fifty-Percent Recovery Rate of "High" Costs

Site	Estimates of Recoverable Costs for the Dredging and Upland Disposal Alternative	Estimates of Recoverable Costs for the Capping Alternative
Between B Street and Broadway Piers	$2,468,400	$45,980
Mouth of Switzer Creek	$1,234,200	$22,990
Foot of Evans and Sampson Streets	$2,468,400	$45,990
Mouth of Chollas Creek	$3,702,600	$68,970
Totals	$9,873,600	$183,930

G. A Two-Year Expenditure Schedule Identifying Funds to Implement the Plans That are not Recoverable From Potential Dischargers

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
- Reports

Estimate $3,200,000

Year 2

- Site characterization
- Engineering report
- Application for CWA Section 404 dredging permit
- Application for state waste discharge requirements
- NEPA and CEQA environmental documentation
- Reports

Estimate $3,600,000