UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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MEMORANDUM

SUBJECT: CSTAG Recommendations on the Montrose/Palos Verdes Shelf Contaminated Sediment Superfund Site

FROM: Stephen J. Ells **/s/ Stephen J. Ells**
Thomas R. Short, Co-chairs **/s/ Thomas R. Short**
Contaminated Sediments Technical Advisory Group (CSTAG)

TO: Fred Schauffler, Remedial Project Manager
Region 9

Background

OSWER Directive 9285.6-08, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (Feb. 12, 2002), established the Contaminated Sediments Technical Advisory Group (CSTAG) as a technical advisory group "that will monitor the progress of and provide advice regarding a small number of large, complex, or controversial contaminated sediment Superfund sites." The main purpose of the CSTAG is to help Regional site project managers of selected large, complex, or controversial sediment sites appropriately manage their sites throughout the Superfund process in accordance with the 11 risk management principles set forth in the OSWER Directive. CSTAG membership consists of one representative per Region, two from the Office of Research and Development, and two from the Office of Emergency and Remedial Response.

Brief Description of the Site

The Montrose/Palos Verdes Shelf (PV Shelf) site comprises a large area of DDT and PCB contaminated sediment located on the continental shelf and adjacent slope off the coast of the Palos Verdes peninsula near Los Angeles, California. DDT is present in the sediment as a result of historic wastewater discharges from the former Montrose Chemical Corporation manufacturing plant in Torrance, California to the Los Angeles County Sanitation Districts (LACSD) sewer system. The plant manufactured DDT from 1947 to 1982. PCBs originated from a variety of industrial and commercial sources that also discharged into the sewer system. LACSD maintains four outfall pipes which discharge treated wastewater into the Pacific Ocean over the continental shelf. The outfalls from the two largest pipes which continuously discharge treated wastewater are located 2 - 2.5 km off Whites Point at a depth of approximately 60 m.

Approximately 11.7 million cubic yards (9 million cubic meters) of contaminated sediment, containing more than 110 tons (100,000 kg) of DDT and 11 tons (10,000 kg) of PCBs, are present over a 17 square-mile (44 square kilometers) area, although the extent of DDT-contaminated sediment is greater, extending northward into Santa Monica Bay and also to the southeast. The contaminated sediment deposit ranges in thickness from 5 centimeters (cm) to greater than 60 cm and is underlain by the firmer native sediments. The contaminated sediments cover portions of both the continental shelf and continental slope off the Palos Verdes peninsula. On the continental shelf, where most of the contamination resides, the contaminated sediments are at water depths ranging from approximately 30 to 100 meters, with the highest concentrations along the 60 m isobath.

The contaminated sediments pose a risk to individuals who regularly consume fish from the area and also have an impact on the marine environment. There are fishing advisories because of the high levels of DDT and PCBs in fish and there is a commercial fishing ban for white croaker on the Palos Verdes Shelf. However, studies have documented that contaminated croaker are still found in local fish markets, particularly in the Asian communities.

In 1990, the federal and state natural resource trustees began a natural resource damage assessment under CERCLA for damages associated with DDT and PCB releases to ocean waters of the Palos Verdes Shelf and surrounding environment, *i.e.*, the Southern California Bight. The ecological impacts of these releases and the remaining contaminated sediment have resulted in one of the largest natural resource damage settlements awarded to date. The settlement provided the Trustees with about $30 million for restoration projects, and EPA received $73 million for its future response costs. The Trustees established the Montrose Settlements Restoration Program, representing six trustee groups, to plan and implement their restoration projects.

As part of its ongoing evaluation of *in situ* capping, EPA conducted a pilot capping project at the site. The pilot project was carried out in a 180-acre (728,000 sq meters) area located northwest of the outfalls, where cap layers were constructed using different combinations of cap material and placement method. The results of the pilot project will help to determine the most effective cap placement (*i.e.*, construction) methods, refine the cost estimates for capping and characterize the short-term impacts associated with cap construction. Generally speaking, the results of the pilot project suggest that a cap can successfully be constructed on the continental shelf portion of the site. EPA is continuing to monitor the pilot capping cells to assess changes in conditions since the capping was completed, including an assessment of recolonization by biota.

The CSTAG visited the site and met with the site team from February 4 to 6, 2003. Five of the invited stakeholders made presentations to the CSTAG. The five presenters included the: Los Angeles County Sanitation Districts; Santa Monica Bay Restoration Commission; Montrose Settlements Restoration Program; Multicultural Area Health Education Center (accompanied by Families in Good Health); and Heal the Bay.

CSTAG Recommendations

Based upon our site visit, review of the site information provided to us, and the presentations made by five stakeholders, the CSTAG offers the following recommendations in order to more fully address the 11 principles. The CSTAG expects that the remedial project manager will consider these recommendations as the investigations continue, as the conceptual site model is refined, and as remedial alternatives are developed and evaluated. The remedial project manager should send a short written response to these recommendations to the CSTAG co-chairs within 60 days.

Principle #1, Control Sources Early

- CSTAG supports the Region's efforts in removing the DDT-contaminated sediment from the sewer pipes and in reducing releases at the outfalls to below State permit levels.
- The Region should summarize their evaluation of the potential impacts of additional sources of DDT (*e.g.*, agricultural runoff) to the site and whether these additional sources are on-going.
- Evaluate the likelihood that contaminated sediment from uncapped areas could be resuspended resulting in contaminating a future clean cap, if one is proposed for remediating the site.
- Available data suggest that there may be on-going erosion of the surface sediments overlying the heavily contaminated sediments east of the outfall. The Region should continue to evaluate the rate of erosion here in order to assess this area as a possible future source of DDT and PCBs to the western part of the site.

Principle #2, Involve the Community Early and Often

- CSTAG supports the Region's efforts in coordinating with numerous community-based organizations representing various multi cultural groups.
- Consider evaluating different media venues (*e.g.*, radio, television) for reaching specific ethnic groups as appropriate. Ensure that any bans or advisories are properly translated for the target audiences.
- Assess whether the 20 fish species currently being evaluated include all those that may be important to the ethnic groups that eat fish routinely.

Principle #3, Coordinate with States, Local Governments, Tribes, and Natural Resource Trustees

- Encourage the State and local health authorities to coordinate and effectively communicate their fish consumption advisories with community-based organizations so that consumers receive appropriate information regarding potential risks due to eating locally-caught fish.
- Continue coordinating the data collection efforts and interpretation of the ecological risk assessment with the trustees as represented by the Montrose Settlements Restoration Program.
- If EPA develops risk-based protective fish tissue levels that are different than the State health advisory values, EPA and the State should develop a risk communication plan to clearly explain these differences.

Principle #4, Develop and Refine a Conceptual Site Model that Considers Sediment Stability

- Examine LACSD's Acoustic Doppler Current Profiler data to determine the range of bed shear stresses to which the contaminated sediments are subjected. Correlate these stresses with the results from the SEDFlume analysis to determine the stability characteristics of the contaminated sediments. This information should be used to determine the extent and likelihood of both sediment resuspension and cap material resuspension due to wave-, current-, and soliton-induced bed shear stresses.
- Evaluate sediment migration and/or mixing that occurred during the *in situ* capping pilot project and incorporate any lessons learned into the evaluation of the effectiveness of any proposed cap for a larger area.
- Carefully evaluate the trends in DDT and PCB concentrations in white croaker tissue, and compare the data with trends in sediment DDT and PCB concentrations and DDT and PCB in tissues of other species.

- Given that white croakers accumulate significantly more DDT and PCBs than other fish and that much of the highly-contaminated effluent-affected sediment is buried with less contaminated sediments, additional information should be collected to further understand all potential routes of DDT and PCB exposure to white croaker. This could include identifying common prey species that white croaker ingest and analyzing their DDT and PCB body burden, and evaluating DDT and PCB uptake from the water column.

Principle #5, Use an Iterative Approach in a Risk-Based Framework

- If the overlying sediment in the area east of the outfall is found to be eroding at a relatively fast rate, consider implementing an early action in this area in order to prevent DDT and PCB dispersion to less contaminated areas west of this area.
- Since the bottom water currents appear to go east to west, when implementing a remedy, consider beginning in the eastern end of the site and proceeding westward.

Principle #6, Carefully Evaluate the Assumptions and Uncertainties Associated with Site Characterization Data and Site Models

- To the extent possible, report, evaluate, and convert if necessary, all "DDT" contaminant concentrations used in site characterization and in the risk assessments in a consistent manner; *i.e.*, as total DDT or as p,p DDE.
- Consider identifying shellfish DDT and PCB body burdens and evaluating the possible resulting risks to shellfish consumers.
- The data obtained during and after the pilot capping project, and the use of these data in calibrating the numerical sediment stability model, should be peer-reviewed.
- It appeared that the Trustee food chain model did not include a benthos component but EPA's ecological risk assessment did. Determine if this difference is important and if it can affect what EPA identifies as remedial action objectives versus what the Trustees identify as resources that need to be restored.
- Evaluate whether the source and age of the data used impact the risk characterization and clarify which data are being used for assessing site risks versus understanding the site history.

Principle #7, Select Site-specific, Project-specific, and Sediment-specific Risk Management Approaches that will Achieve Risk-based Goals

- Enhance the existing screening analysis of the range of alternative remedial options (*i.e.*, dredging, hot spot removal, capping, monitored natural recovery, no action) in the feasibility study. Also consider combinations of alternatives and addressing smaller areas within the site (*i.e.*, eastern end).

Principle #8, Ensure that Sediment Cleanup Levels are Clearly Tied to Risk Management Goals

- Establish remedial action objectives for the site that are achievable; *i.e.*, acknowledge that remedial actions taken near the Palos Verdes outfall area may not result in complete recovery of the eagle population in the Channel Islands owing to the expected levels of residual DDT in the Southern California Bight after any remediation option.
- Clarify the link between predicted post-remedy residual DDT and PCB sediment concentrations and acceptable white croaker tissue concentrations.

Principle #9, Maximize the Effectiveness of Institutional Controls and Recognize their Limitations

- Continue to monitor the effectiveness of existing institutional controls by evaluating the data from the fish-in-ocean and the fish-in-market monitoring programs.
- Evaluate the need to put the fish advisories into additional languages for distribution to target audiences.
- If capping and/or monitored natural recovery is selected, identify whether any institutional controls are necessary to restrict certain activities that may compromise remedy protectiveness (*e.g*., consider whether commercial fishing activities, such as trawling, would adversely affect the selected remedy).
- If capping and/or monitored natural recovery is selected, evaluate various approaches for providing information to mariners regarding the boundaries of the affected remediated area (*e.g*., placement of buoys, modifications to NOAA nautical charts) in order to prevent sediment disturbance.

Principle #10, Design Remedies to Minimize Short-term Risks while Achieving Long-term Protection The CSTAG recognizes that site investigations are still on-going, that data are still being evaluated, and that the Region is not ready to propose a remedy for the site. If a dredging and/or capping remedy is proposed, however, careful consideration should be given to evaluating the adverse impacts to biota and habitat that might result, and to incorporating methods to minimize any potential impacts.

- In order to maximize cap stability and permanence, evaluate the use of different grain-sized cap materials in different areas of the site using the results from the sediment stability analysis.
- Carefully evaluate the methodologies, data, and conclusions of the *in situ* capping pilot project in evaluating the effectiveness of capping options, especially the finding that there was no disturbance of the highly contaminated, buried DDT and PCBs.
- In light of the pilot study and SEDFlume results, fully evaluate the effects of the multiple methods of cap material placement used in the pilot project on bed sediment resuspension/mixing. Consider using different placement methods in different areas of the site.
- Evaluate cap thickness assumptions and the availability of various grain-sized materials in sufficient quantities to implement possible capping remedies.
- Evaluate the effect that different grain-sized cap materials would have on attracting or repelling white croakers to the capped area.

Principle #11, Monitor During and After Sediment Remediation to Assess and Document Remedy Effectiveness The CSTAG recognizes that the Region will not be developing a long-term monitoring program for this site for some time, but offers the following recommendation to be considered in the future.

- In addition to white croaker, consider using sessile organisms (*e.g.*, mussels) to monitor remedy effectiveness.

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