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The COSCO-Busan Oil Spill, San Francisco Bay:
Responding to the Potential for Submerged Oil in the Vicinity of Dredging Projects

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Introduction:

The Dredged Material Management Office (DMMO) is an interagency committee comprised of representatives from the U.S. Army Corps of Engineers (Corps), the U.S. Environmental Protection Agency, the San Francisco Bay Conservation and Development Commission, the San Francisco Bay Regional Water Quality Control Board (Regional Water Board), the California State Lands Commission, and state and federal wildlife agencies. One of the duties of the DMMO is to determine, by reviewing sediment test results, the suitability of dredge sediment for aquatic placement (disposal).

In early November 2007, the tanker COSCO-Busan struck a pier supporting the San Francisco-Oakland Bay Bridge, spilling 58,000 gallons of bunker oil into San Francisco Bay. Initial response focused on floating oil, oiled wildlife, and shorelines. That response did not take into consideration whether oil might later make its way into Bay sediments, by any particular mechanism, and later be dredged. The DMMO and the Corps (Civil Works/Maintenance Dredging) were concerned about the possibility of the oil finding its way into sediments. The question for the DMMO was how to establish a reason to believe, quickly and affordably, that areas previously tested and approved for dredging and disposal were free of submerged oil?

The Problem:

Most dredging projects in San Francisco Bay have environmental work “windows” that close on November 30. A delay waiting for oil cleanup to be completed (possibly until the next work window, which began on June 1 the following year) could affect navigation safety and commerce. Dredging past November 30 could affect endangered species. Since most of the

dredging had been completed for the year, there were relatively few on-going projects to consider

Literature information on the raw product indicated little likelihood that the oil would sink. However, concern remained for oil, tar balls, etc. to entrain sediment and other debris after contact with shorelines (incl. during cleanup), re-enter the water column and sink. If oil sank and settled in nearby channels, berths, and marina basins, dredging with aquatic disposal could not go forward until the oil was remediated.

Early contact was made with the Corps' Engineering Research and Development Center (ERDC) in Vicksburg, Mississippi to find out how the issue of submerged oil might have been addressed on other spills, if at all. ERDC had no direct experience, but did have suggestions about possible ways to do sampling (including both chemical measurements and potential presence/absence surveys); no one knew what to do for a rapid and inexpensive test.

The DMMO allowed one method, once, for detecting the presence of submerged oil. That was to take several surface grab samples in a dredge footprint for quick, visual analysis. This method was used in a shallow water location at Belvedere in Marin County. Those grab samples indicated no submerged oil. This method, however, was not considered very acceptable due its hit-and-miss nature.

Fortunately, the DMMO was made aware of another method, used in Delaware. The DMMO member from the Regional Water Board was forwarded a paper that discussed an oil spill in the Delaware River in late 2004. The method of detecting and recovering submerged oil in that case was the use of a towed array of oil-absorbent snares, or pom poms. (Unbeknownst to the DMMO, this method was also being used in some areas in San Francisco Bay [in eelgrass beds and near shore to certain oiled beaches] by the Unified Command [USCG, NOAA, CDFG, State Parks], which was in charge of the cleanup activities.) The DMMO considered this a very viable method of detection and began investigating its use.

A Probable Solution:

The DMMO considered the "pom pom" swabbing method to be satisfactory. Dredging projects adjacent to oiled shorelines were the primary focus. The DMMO agencies therefore established a hierarchy for projects in, near, or outside the spill area:

1. Projects outside spill area or with appropriate upland disposal could proceed as permitted.

2. Projects in spill area not immediately adjacent to oiled shorelines could proceed with observers on board the scow. Dredging was to stop if an oil sheen was seen. Further evaluation would be needed.
3. Projects immediately adjacent to oiled shorelines could proceed with observers only after a presence/absence survey. Any indication of oil would trigger more intensive evaluation.
4. Certain other projects in the spill area had to wait for following year

The pom pom swabbing method was incorporated at two of the areas that were proposed to be dredged: Oakland Harbor (a Corps maintenance dredge project in a deep-water location) and near Yerba Buena Island (a California Department of Transportation, Bay Bridge project in a mid-depth location). The swabbing method indicated no submerged oil near dredging operations at either location. (As well, the Unified Command found no submerged oil in shallow water areas it tested.)

It is important to note that the DMMO approach did not suggest that the entire Bay bottom was free of tar balls or other oil product – only that those areas sampled were determined to be free of oil at the time of dredging. Subsequent to this testing, the DMMO determined that normal sampling and testing procedures would be adequate for future dredging and disposal decisions.

The next spring, following cleanup, DMMO required additional chemical analysis in one high-concern area (Berkeley Marina), and found no indication of submerged oil

Lessons Learned:

1. Plan ahead! Especially with environmental windows, there is a need to make dredging decisions quickly. With the COSCO-Busan oil spill, environmental work windows were closing and the DMMO needed to make rapid decisions or (a) risk impacts to endangered species by allowing dredging outside the work window, or (b) shut down dredging, which could affect navigation and commerce for several months, perhaps unnecessarily. Establish contacts with responders ahead of time. Communication with them can be difficult so there is a real need to establish contacts ahead of time. Dredgers would need spill and cleanup information from responders in order to do dredging planning. Public will expect some assurance regarding dredging so know how to provide that assurance. The DMMO determined there was a need establish only a “reason to believe” that submerged oil was not present; not a level of “absolutely certainty”.

2. The “pom pom” approach seems to be a reasonable method for doing benthic presence/absence surveys in dredging areas: it is quick: with no waiting for analytical results and is reasonably affordable.*
3. Responders on future spill incidents should consider the possibility of sunken oil, both during and after shoreline cleanups, especially near dredging areas. The Unified Command tested eelgrass beds and near-shore areas along oiled beaches.

*General costs for pom pom sampling for the dredging project over at Yerba Buena Island:

Consulting services - Preparation of SAP, 2 meetings with DMMO, and final reporting after study completion ~\$6,000; **Construction of the oil mop** - ~\$1500 (one time cost since it can now be used for other projects (need new pom-poms for each project); **Performance of study** - ~\$6,300 which included boat rental, 3 staff, skipper, tracking of oil mop using Hypak System, and photo-ionization detector (model : RAE2000) rental (used to detect the presence of any hydrocarbon vapors being released by the material retained on the oil snare pom-poms).

With everything in place with lesser SAP and reporting requirements:

Letter study plan and data report - ~\$2800 Performance of 2 transects with 3 staff and boat for a day - ~\$5,000

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