



Evaluation of Z-Layer Mercury Concerns in Lower Newport Bay Federal Navigation Channels

ERDC Dredging Operations Technical Support Program (DOTS)

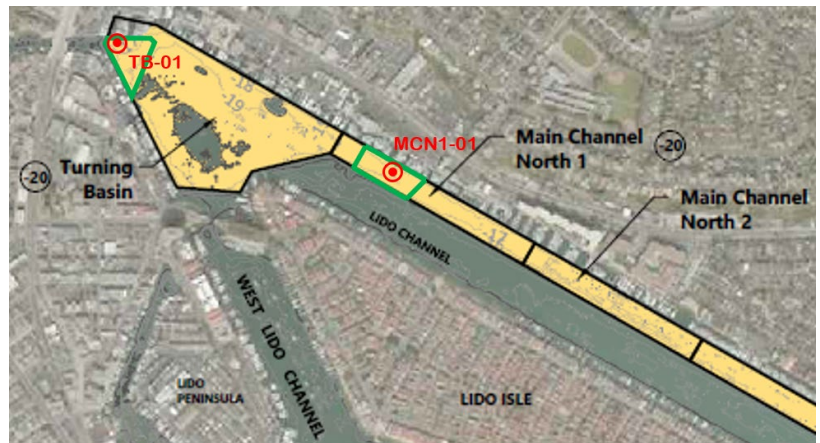
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Response Summary:

The Los Angeles District has encountered elevated mercury levels during z-layer testing within Lower Newport Bay, California. The z-layer is the sediment immediately beneath the sediment proposed for dredging and would be exposed to the water column and benthic organisms post-dredging. Analysis at two core locations demonstrated sediment concentrations above the Total Threshold Limit Concentration (TTLC), resulting in classification as hazardous waste. Analysis of the overlying sediments within the dredging prism showed no toxicity and acceptability for either ocean disposal or as slip fill within the Port of Long Beach. However, the high mercury levels in the z-layer present concerns which could preclude dredging.

ERDC proposed a reduction of dredging depths for the areas with z-layer TTLC exceedances. This would leave a layer of the cleaner overlying material in place to prevent exposure of the higher concentrations and provide chemical, physical and biological isolation. A series of model runs using the RECOVERY model were conducted to predict mercury diffusion into the overlying sediment and resulting concentrations at the surface. Scenarios were modeled simulating layers of six inches and eight inches left in place over the highest z-layer concentration. The simulations showed mercury at the surface reached maximum concentrations of 4.7 mg/kg and 3.3 mg/kg for the six- and eight-inch layers, respectively, which are well below the TTLC level of 20 mg/kg and within the range of existing concentrations in the surrounding sediments. A minimum layer of 8-inches was recommended to provide sufficient chemical isolation as well as physical and biological isolation. The spatial extent of areas that should receive shallow dredging were delineated based on the proposed dredging footprint and areas represented by individual cores.



Core locations with elevated z-layer Hg and proposed shallow dredge areas.

Period of Performance:

21 Jan 2025 – 29 Jan 2025

Benefits of the Response to the USACE Dredging/Navigation Program:

ERDC provided insight as to risks associated with mercury and a strategy for mitigating risk to the environment. Model results demonstrated that leaving a layer of sediment in place would result in only slight increases of mercury at the sediment surface. The findings could allow shallow dredging in these areas to restore navigable depths and remove the maximum amount of unsuitable sediment as possible, resulting in a cleaner harbor.

Deliverable:

Modeling results and recommendations were provided in a technical memorandum. The memorandum provides background information on risks associated with mercury, describes the problem and site conditions, and details the RECOVERY model input and results. Recommendations were provided for maximum dredging depths and spatial areas where dredging depths should be limited to avoid elevated mercury concentrations in the exposed sediment surface.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

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