

## **Sediment Toxicity Assessment of Pago Pago Harbor, American Samoa**

*Steven L. Costa* (scosta@ch2m.com) (CH2M HILL, P.O. Box 1238, Trinidad, CA 95570)  
Peter J. Peshut (pjp617@uow.edu.au) (American Samoa Environmental Protection Agency, P.O. Box 368A, Pago Pago, AS 96799, American Samoa)  
Carl L. Goldstein (goldstein.carl@epamail.epa.gov) (U.S. Environmental Protection Agency-Region 9, 75 Hawthorne Street, San Francisco, CA 94105)  
Karen A. Glatzel (kglatzel@ch2m.com) (CH2M HILL, P.O. Box 1238, Trinidad, CA 95570)

A comprehensive initial baseline sediment toxicity evaluation has recently been completed for Pago Pago Harbor, American Samoa. The purpose was to determine the potential extent and nature of a wide range of potential contaminants in sediments throughout the Harbor. The results of the study provides a baseline for future planning and management activities for the Harbor as a high priority element of a water quality monitoring strategy recently developed by the American Samoa Environment Protection Agency (ASEPA). In addition to providing a critically needed baseline survey, the impetus for developing and implementing the study included support for an ASEPA fish toxicity investigation. Sources of potential sediment contamination include the past use of the Harbor by the U.S. Navy as a coaling station, past filling and landfill practices around the Harbor, a sunken WWII U.S. Navy fuel transport, and existing discharges to the Harbor by tuna canneries, a small ship repair facility, electric power generation, point source domestic wastewater discharges, and runoff from domestic and light commercial uses.

Pago Pago Harbor is located 14°16' south of the equator approximately 2600 miles southwest of Hawaii. The remote location of the site and lack of basic support infrastructure for sampling, combined with a disparate and limited existing data base, presented particular challenges to a cost effective assessment study. These issues were address by developing a phased approach to the overall study using the simplest effective sampling techniques. This approach included an extended schedule to evaluate results and modify sampling design as the study progressed, and collecting and archiving supplemental samples. Reviews of existing data and a screening study using surficial samples throughout the Harbor was fist completed. Seafloor mapping of bathymetry, sub-bottom profiling, and a side scan sonar survey throughout the Harbor to locate areas of particular interest and reveal sediment thicknesses was then done. The sub-bottom profiling and identification of land derived sediments defined the areas of highest concern. A detailed follow-up sampling study based on the collection of core samples was the third phase. A data gap sampling effort and fate and transport evaluation was then completed. An external inspection and assessment of the U.S. Naval fuel ship on the bottom (160-foot depth) of the Harbor as a potential past and future source of contaminants was also done.

The results of the investigation demonstrate relatively low levels of contamination throughout much of the Harbor, with highest contamination of heavy metals and PCBs located in sediment pools of limited sediment depth in the innermost portions of the Harbor that are confined by small scale geologic structures. Highest levels of contaminants are generally below the sediment surface indicating past sources of contamination. The most serious existing potential source of future contamination is the fuel still contained in the sunken Navy vessel. The current level of contamination does not appear to require active remediation and the need for and requirements of future monitoring are well defined.