

## Integration of Sustainability and Resiliency into a Remedy Optimization Review Framework

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**Background/Objectives.** It is not uncommon to revisit a remedy evaluation study to take into consideration current treatment technologies, new site data such as pilot study results, and advancements in risk management strategies. This phase in the project life cycle is an ideal opportunity to revisit and redefine site-specific sustainability and resiliency metrics. For the Hunters Point Naval Shipyard Site (HPNS Site) Parcel F sediment remedial unit, an Optimization Review, comprised of a Remedial Alternative Analysis (RAA) and Green and Sustainable Remediation (GSR) Evaluation, was performed to ensure the most appropriate remedies are screened, evaluated, designed, and implemented. The Optimization Review evaluated the 2008 Feasibility Study (FS) prepared for the HPNS Site. The 2008 FS developed two multi-component remedies, one for Area III, a 3.5-acre peninsula located in the northeastern portion of HPNS, and one for Areas IX/X, a shallow basin located south of HPNS. Historical activities at the Site have resulted in contamination of offshore sediments with polychlorinated biphenyls (PCBs), copper, lead and mercury.

**Approach/Activities.** The Optimization Review process provides an independent assessment of the following proposed remedial components: (1) technical approach (i.e., proposed remedial technologies versus monitoring techniques, risk management, and conceptual site model [CSM]); (2) regulatory issues (i.e., selection of preliminary remediation goals [PRGs]); (3) sustainability impacts from remedy implementation; (4) resiliency measures to address climate change impacts, and (5) cost implications from optimization recommendations.

**Results/Lessons Learned.** The Optimization Review assisted with selection of a proposed remedial alternative based on the 2008 FS for Area III and determined that a refined remedial alternative was feasible for Area IX/X based on new site findings (e.g., in situ pilot study results) and more recent regulatory guidance on GSR and resiliency. Based on the GSR assessment, the optimized alternative developed for Areas IX/X had a 42% to 75% lower environmental footprint relative to removal-based alternatives, as well as minimized local community impacts. Furthermore, the Optimization Review identified opportunities to maximize the technical efficacy, risk management, and resiliency, whilst minimizing sustainability and cost impacts of remedy implementation in both Area III and Areas IX/X. These potential refinements included incorporation of PCB background concentrations, incorporation of in situ treatment, optimization of engineering controls, beneficial use of excavated sediments, optimization of areas targeted for active remediation, and integration of sustainable and resilient best management practices into remedial design.