Returning Former NFD Point Molate to Beneficial Reuse: The Challenging Cleanup of a Fuel- and Metal-Impacted Sump Pond

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Background/Objectives. Former Naval Fuel Depot (NFD) Point Molate is a 412-acre former fuel storage facility, located on the San Francisco Bay ("Bay") shoreline, that operated from 1942 to 1995, and had the capacity to store over 40 million gallons of fuel in twenty 2-million-gallon underground storage tanks. Over time, the facility stored jet propellant grade 5, marine diesel fuel, bunker fuel, aviation gasoline, and gasoline. In 2010, NFD Point Molate was transferred to the City of Richmond through a Base Realignment and Closure (BRAC) early transfer process. As part of the BRAC early transfer process, the City of Richmond assumed responsibility to complete clean-up activities at NFD Point Molate, with the Navy providing funding through an Early Transfer Cooperative Agreement (ETCA) grant. Installation Restoration (IR) Site 3, an 11-acre site, including a 3-acre, 25-foot-deep waste oil sump immediately adjacent to the Bay, presented the greatest remedial challenge at NFD Point Molate. The former sump pond was used to dispose of contaminated fuel, tank bottom sludges, bunker fuel, and other liquid and solid wastes, including used batteries. A large-scale remedial approach was designed and implemented under challenging regulatory and physical conditions.

Approach/Activities. Pre-transfer negotiations with State regulators (San Francisco Regional Water Quality Control Board; RWQCB) indicated that a removal action of shallow soil exceeding human-health risk targets, and deeper soil containing mobile petroleum-hydrocarbon free product, would be the approved remedial approach. Mobile free product was defined by correlating petroleum hydrocarbon concentrations measured using UV fluorescence, with free product measurements using centrifugation and the Dean-Stark extraction method. During the development of the Remedial Action Plan, public comment and regulator personnel changes led to a reevaluation of the site as a waste management unit per California Code of Regulations Title 27. Based on public comment, on-site, ex-situ thermal treatment was added to the Feasibility Study as a potential remedy. However, thermal treatment was not cost-competitive with direct disposal of waste soil at local landfills. The selected remedial alternative included demolition of existing groundwater extraction and treatment system; soil excavation and off-site disposal; excavation dewatering and treatment; backfilling the excavation with clean soil; and installation of a 1,100-foot contingency groundwater sparge trench.

Results/Lessons Learned. Remedial implementation included removal of 202,000 tons of petroleum-affected soil and solid wastes with lead and arsenic contamination to a depth of 25 feet. Challenges during implementation included: 1) completing the project within the ETCA grant funding, 2) expansion of the volume of hazardous waste, 3) site proximity to biological and cultural resources, 4) depth of excavation leading to increase in dewatering flow rates, and 5) high rainfall extending construction over two seasons. Most construction challenges were adequately managed by the soil removal contractor with minimal cost impacts. However, removal of an 1,100-foot-long sheetpile wall that stopped infiltration of Bay water into the excavation prior to backfilling the excavation led to excessive dewatering rates and permit exceedances. The total ETCA grant for NFD Point Molate was $28.5 MM. IR Site 3 soil remediation construction costs were $11.7MM. Post-remediation challenges remain, including regulatory changes regarding potential risks related to polar degradation products of petroleum

in proximity to ecological receptors in San Francisco Bay, and residual contamination in inaccessible areas requiring ongoing monitoring and management.