

## Remedial Investigations/Feasibility Studies

Windward has considerable experience conducting remedial investigations/feasibility studies (RI/FSs) under both federal (e.g., Superfund and Resource Conservation and Recovery Act [RCRA]) and state jurisdictions. We are nationally known for our expertise on large sediment sites, where strategic sampling and analysis are essential in order to obtain remedial solutions that are risk based and take into account regional background conditions. Windward also specializes in representing client groups conducting RI/FS projects. The consensus-building skills necessary for these projects are invaluable when negotiating successful outcomes with regulatory agencies.

Windward's knowledge extends to all elements of site investigation, including environmental chemistry, risk assessment, statistics, toxicology, hydrogeology, fate and transport analysis, stormwater assessment, and remedial design. Our field support, database management, and geographic information system (GIS) teams implement sophisticated data collection and analysis techniques that are essential to a successful study. Strategic study designs more than pay for themselves in reduced cleanup costs.

### Lower Duwamish Waterway RI/FS

Windward was retained by the Lower Duwamish Waterway Group (LDWG) to serve as the group consultant to develop a comprehensive technical strategy to address environmental and human health issues associated with sediment contamination within the Lower Duwamish Waterway (LDW) in Seattle, Washington. As part of the RI, a risk management process was developed to identify the major processes that govern the sources, distribution, and potential effects of chemicals in the LDW. Iterative sampling and analysis was conducted to answer key questions related to potential exposure pathways for people and animals and remedy selection.

During the RI process, Windward developed innovative techniques to interpret and convey large amounts of data in a manner acceptable to both the agencies and the client group and accessible to the public. For the FS, Windward led efforts related to residual risk management and background considerations.

### Port of Seattle T-117 EE/CA

Windward provided environmental and site management services to the City of Seattle and Port of Seattle for Terminal 117 (T-117). Previously, a removal action that targeted polychlorinated biphenyl (PCB)-contaminated soil in the former operations area had occurred; under EPA's Superfund program, the site was a prime candidate for early remediation activities.

Windward completed several rounds of sediment, soil, and groundwater sampling between 2003 and 2005 to further determine the nature and extent of contamination, and to gather source control-related information in support of the planned sediment remediation activities. This comprehensive sampling program revealed the presence of elevated levels of PCBs in upland locations adjacent to the river bank, which had not been examined during previous investigations. Windward initiated a comprehensive upland sampling program and completed a data gap analysis report in order to summarize and consolidate all past investigation activities and results throughout the expanded site area.

Windward coordinated the engineering evaluation/cost analysis (EE/CA) for a sediment and soil removal action to address PCB contamination in the offshore sediment, shoreline bank, and portions of the upland property. The EE/CA addressed the adjacent river sediment and river bank, the entire upland T-117 property, and city-owned streets in the vicinity of the terminal.

### Former Pulp Mill in Port Angeles, Washington

Windward was retained to conduct an RI/FS for the in-water portion of a former pulp mill, which was decommissioned in 1999 and is being investigated under a state-led cleanup order. A major consideration in the RI/FS was the integration of cleanup activities with construction related to the site's end-use, as well as restoration activities.

As part of the RI, Windward integrated multiple lines of evidence to derive an in-water conceptual site model (CSM). This CSM formed the basis of the marine RI, in which all data were compiled to present a comprehensive picture of the nature and extent of contamination, as well as a comparison to background data. For the FS, Windward used the results of the marine RI to derive preliminary cleanup standards for sediment, delineate areas of sediment remediation, and evaluate restoration alternatives. The CSM proved to be instrumental in refining the scope of the site, and in defining the range of restoration alternatives; alternatives have been identified for a variety of site end-uses, from industrial to full restoration.