ecoSPEARS

ecoSPEARS is developing cost-effective cleanup solutions to extract and destroy toxic contaminants from impacted sediment, soil and groundwater.

PORT of SAN DIEGO

PILOT PROJECT

In 2019, ecoSPEARS partnered with the Port of San Diego to demonstrate its innovative in-situ technology to extract contaminants from impacted marine sediment. ecoSPEARS is a start-up company comprised of a fast-growing team of innovators, engineers, and scientists developing cleanup solutions for contaminated sediment.

SPEARS stands for Sorbent Polymer Extraction and Remediation System. Shaped like spikes, SPEARS filled with a proprietary solution are deployed into contaminated sediment or around challenging facilities like wharves/piers or sensitive wetland areas where dredging may not be feasible. Once settled into the sediment, the SPEARS act like sponges, passively absorbing chlorinated toxic contaminants such as polychlorinated biphenyls (PCBs) and dioxins. Once the remedial site goals are met, the SPEARS are safely removed and retrieved, and then the SPEARS enter a green chemical process to destroy the PCB's absorbed.

HIGHLIGHTS

In January of 2022, ecoSPEARS conducted a 12-month retrieval event where 1/3 of the deployed SPEARS were retrieved to collect data. Studies are currently being conducted by both ecoSPEARS and third-party laboratories to measure the mass of PCBs in the SPEARS that were retrieved.

CURRENT STATUS

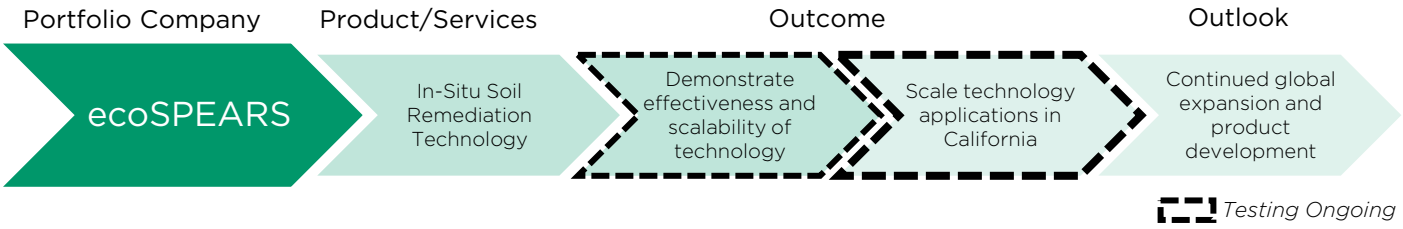
In support of the pilot, the Port is providing funding, permitting, and environmental review as well as access to Port-controlled land in San Diego Bay to test the SPEARS technology. The permits for the pilot were obtained, two baseline sampling events were conducted, and the SPEARS deployment took place on December 14, 2020. The results from the pilot will serve to demonstrate and scale this innovative approach to sediment and soil remediation in Port environments.

Scorecard: ecoSPEARS / FY21-22

PILOT TIMELINE: Board Approval: 6/8/2019 Start Date: 10/15/2019 End Date: 12/31/2022

PILOT OVERVIEW

Tracking progress from pilot project to commercial success



KEY PERFORMANCE INDICATORS & HIGHLIGHTS

OVERALL KPI	Effectiveness in reducing PCB concentrations in sediments	No solvent/water exchange across spike	Destruction of extracted PCBs	Assess effectiveness in treating PCB-impacted sediment using solvent-rinse extraction process
FY21-22 Highlights	SPEARS technology performance will be evaluated after 12, 18, and 24 months of deployment at two locations in San Diego Bay. A SPEARS retrieval event took place 12 months after deployment, in January 2022, for comprehensive data collection and to visually inspect the remaining ecoSPEARS mats.			
FY20-21 Highlights	ecoSPEARS deployed SPEARS technology at two locations in San Diego Bay. The primary goal will be to determine how much PCB mass the SPEARS technology will remove over a 24-month period compared to baseline concentrations.			

As part of the pilot project, ecoSPEARS has launched an in-house surrogate study to replicate field conditions within San Diego Bay sediments. Sediment from the deployment sites was placed inside of a glass reaction chamber to monitor and estimate the quantity of PCB mass removed.