

Willamette River Downtown Reach Remediation at Two Sites: Challenges, and Lessons Learned for Future Actions

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Background/Objectives. The Downtown Reach of the Willamette River in Portland Oregon has been heavily developed and modified during the past 150 years. The Downtown Reach is the four-mile stretch of river directly upstream of the Portland Harbor Superfund Site. In 2008, the Oregon Department of Environmental Quality (DEQ) and other partners initiated a study of sediment quality in the Downtown Reach. Portland General Electric (PGE) worked with DEQ during this effort; culminating in the Record of Decision issued for two PGE sites in 2015 that specified the installation of two one-acre sediment isolation caps at River Miles 13.1 and 13.5. Design, permitting and construction were completed from 2015 to 2017. These projects demonstrate what is really needed to design, permit and construct sediment caps in an active urban waterway and highlight applicable challenges and lessons learned that will impact future remedial actions within Portland Harbor.

Approach/Activities. PGE investigated two areas in the Willamette River, each several acres. Through investigation and design, the footprints identified for capping were reduced to a little over one acre at each site. For implementation purposes, construction was performed over multiple years, rather than constructing multiple caps in the same year. Each cap had its own set of technical and regulatory challenges, with design and permitting performed separately. During design for one area, a 20-foot deep scour hole from a water line leak was found which exposed and undermined four high voltage submarine cables. One cap had to be redesigned due to cap material not meeting specification, resulting in one-third of the cap being supplemented with activated carbon. Overall, 230 tons of debris were removed from the river and roughly 24,000 cubic yards of sand and gravel were placed to cap 2.5 acres.

Results/Lessons Learned. Many lessons learned and challenges were encountered during implementation of these two smaller-scale projects. Challenges, similar in nature but of much greater size and complexity, can be expected during the significantly larger Portland Harbor cleanup. Some issues to consider during Portland Harbor remedial design and construction include the following:

- Balancing cap permanence (armor stone) against habitat requirements for permitting.
- Working around existing structures to allow for ongoing and future public and private use.
- Design and construction should allow for adaptive management; new issues and unknowns will come up. Change is difficult to avoid so prepare for it.
- Administrative portion of work (permitting, easements, regulatory orders) takes time, patience, and persistence.
- Working in the fish window puts importance and limitations on schedule.
- Many stakeholders to balance, often with conflicting objectives.
- An approach for one project may not work for another.
- Need a good team to deliver and work through issues.