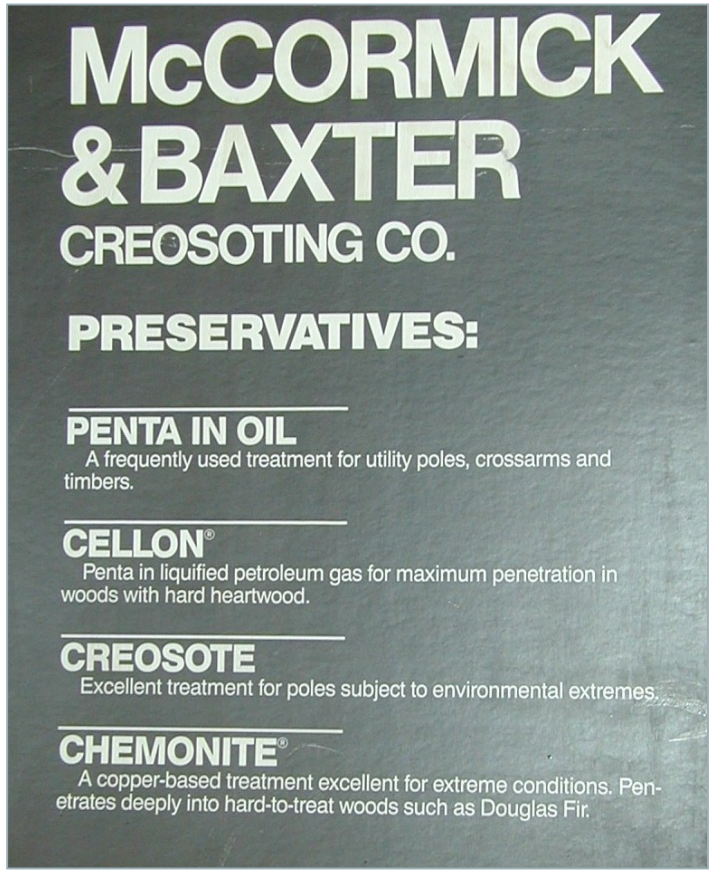
McCORMICK & BAXTER
OR

KEVIN PARRETT, OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

McCormick & Baxter Site Overview

Objectives of Remediation

- ROD Operable Units (1996)
  - Sediment, groundwater, and soil
- Sediment COCs
  - cPAHs (2 mg/kg), dioxins/furans (80 ng/kg), arsenic (12 mg/kg), PCP (100 mg/kg), AWQCs, and bioassays
- Human Health
  - Direct contact with contaminated sediments
  - Consumption of contaminated fish and crayfish
- Ecological
  - Direct contact of aquatic organisms with contaminated sediments

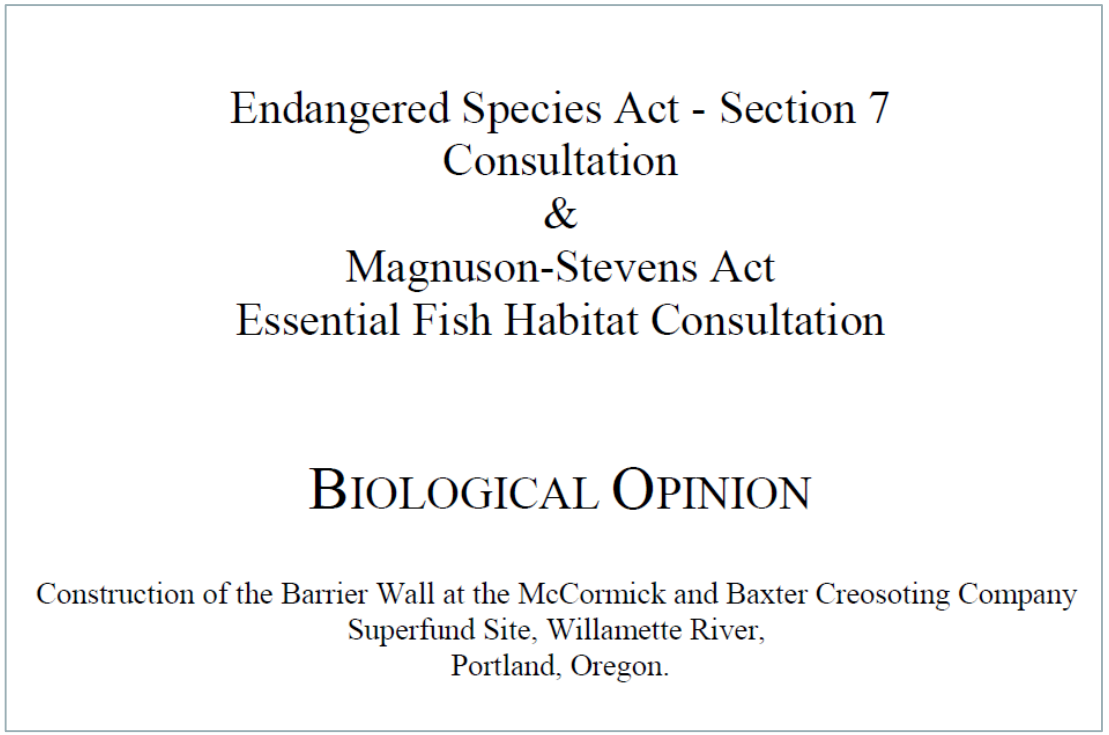


Summary of Remedy

- 1990 to 2011: Creosote extraction (6,600 gallons)
- 1990: Soil hot spot removal (34,000 tons)
- 2003: Groundwater barrier wall (18 acres)
- 2004/2005: Sediment cap (23 acres)
- 2005: Soil cap (15 acres impermeable, 25 acres permeable)

Significant Remedy Scope or Schedule Deviations

- Remedial Design – ESA and PHSS
- Construction
  - BiOp delay
  - Fish exclusion
  - Submerged debris and structures
  - Residual NAPL
  - Contractor management
- Post-construction
  - Ebullition-induced sheen
  - ACB voids and buckling



Endangered Species Act - Section 7
Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

BIOLOGICAL OPINION

Construction of the Barrier Wall at the McCormick and Baxter Creosoting Company
Superfund Site, Willamette River,
Portland, Oregon.

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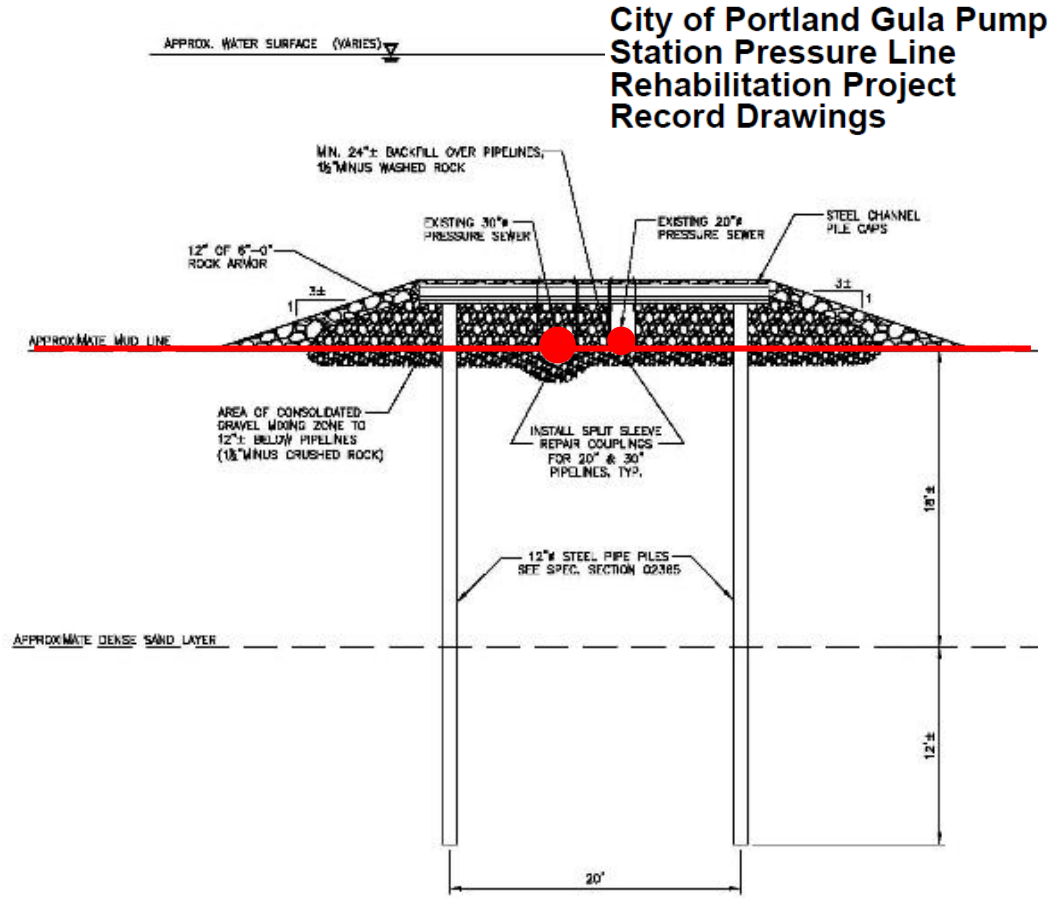

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CETCO Reactive Core Mat

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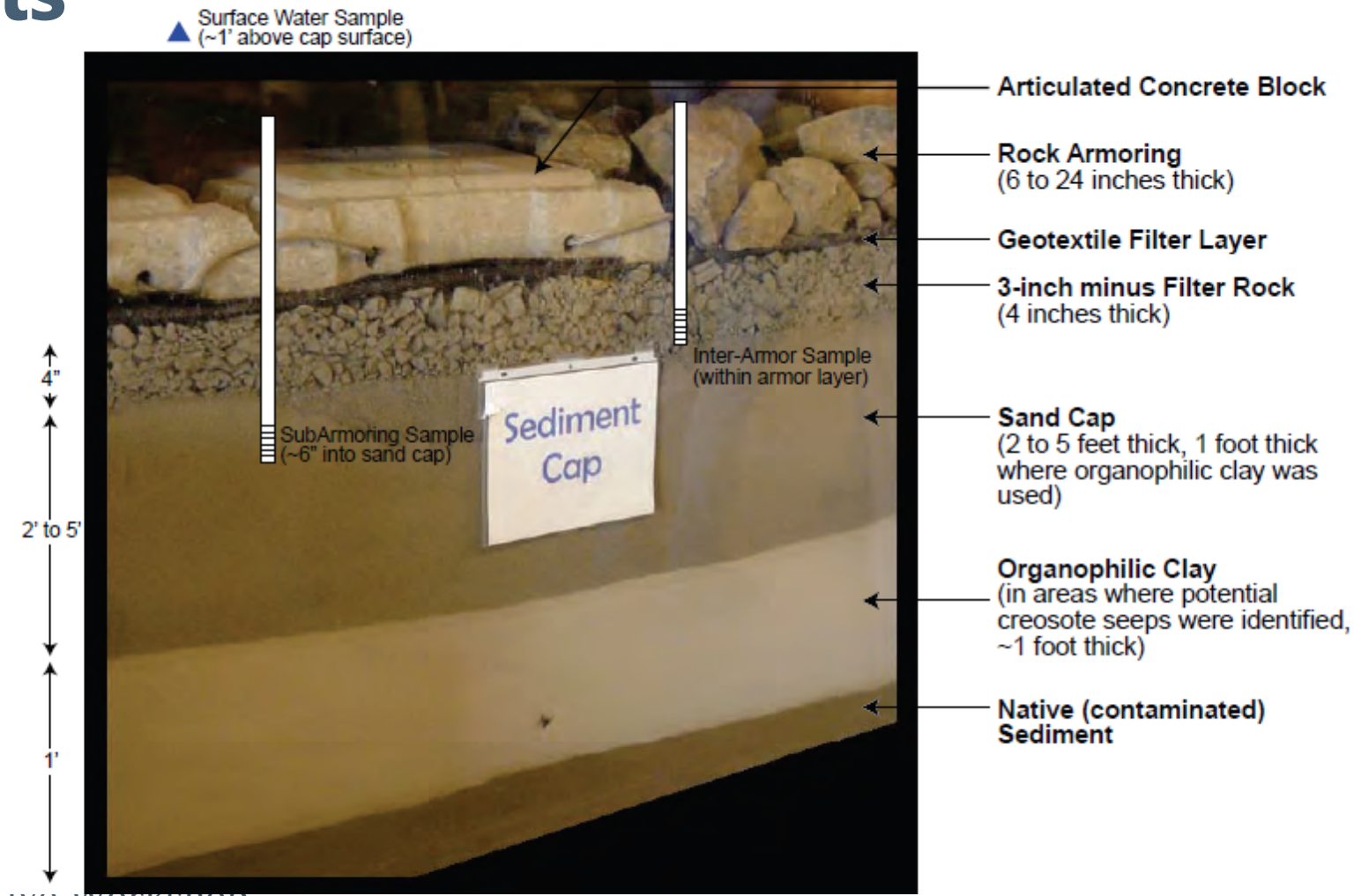
When Were External Sources Characterized and Addressed?

- NAPL extraction alone was ineffective

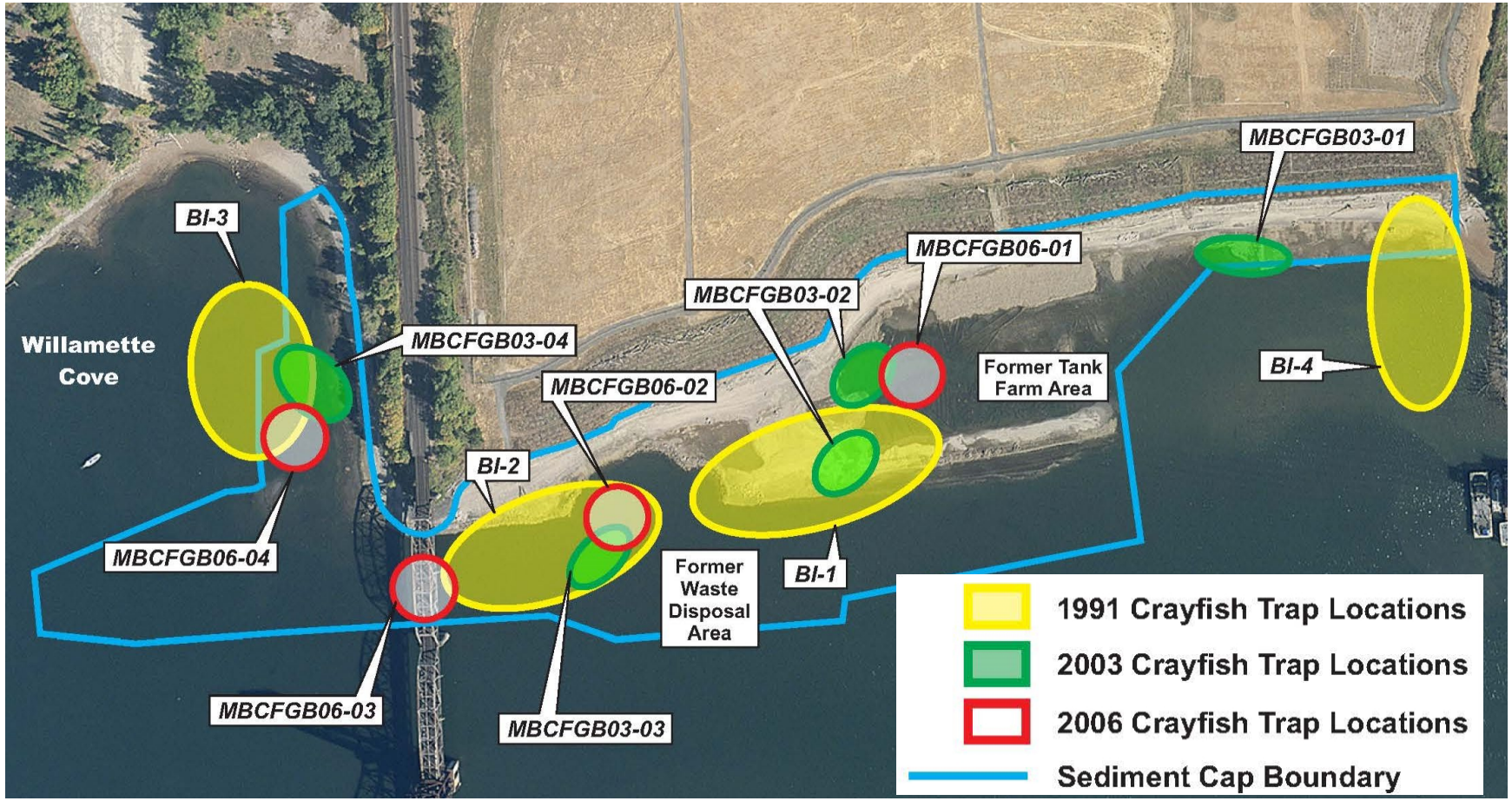
Primary Pre- and Post-Remedy Effectiveness Monitoring Elements

- Surface water, cap inter-armoring, and cap sub-armoring
- PAHs, PCP, arsenic, and copper

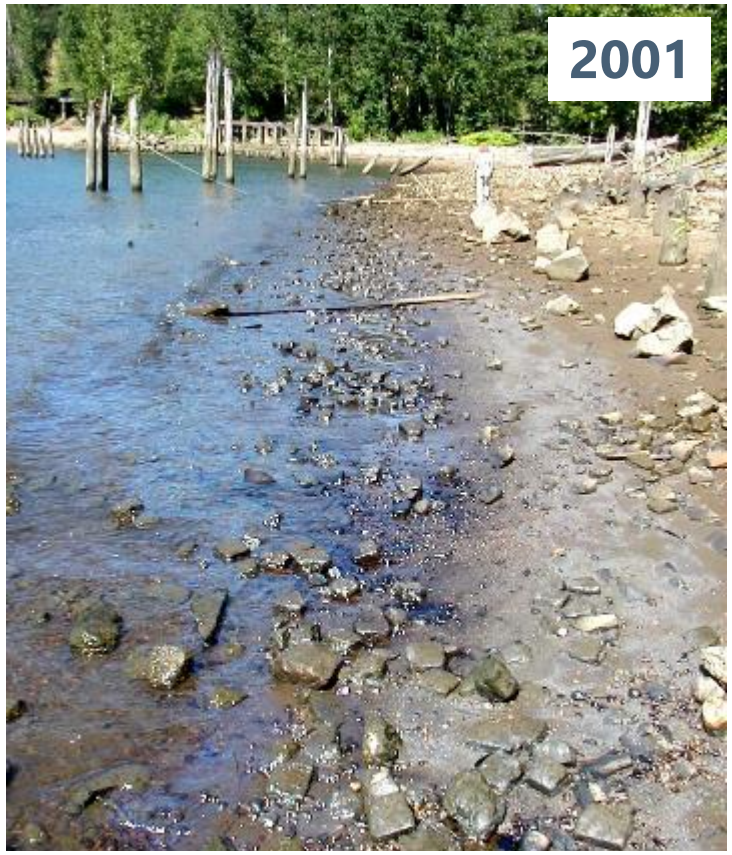


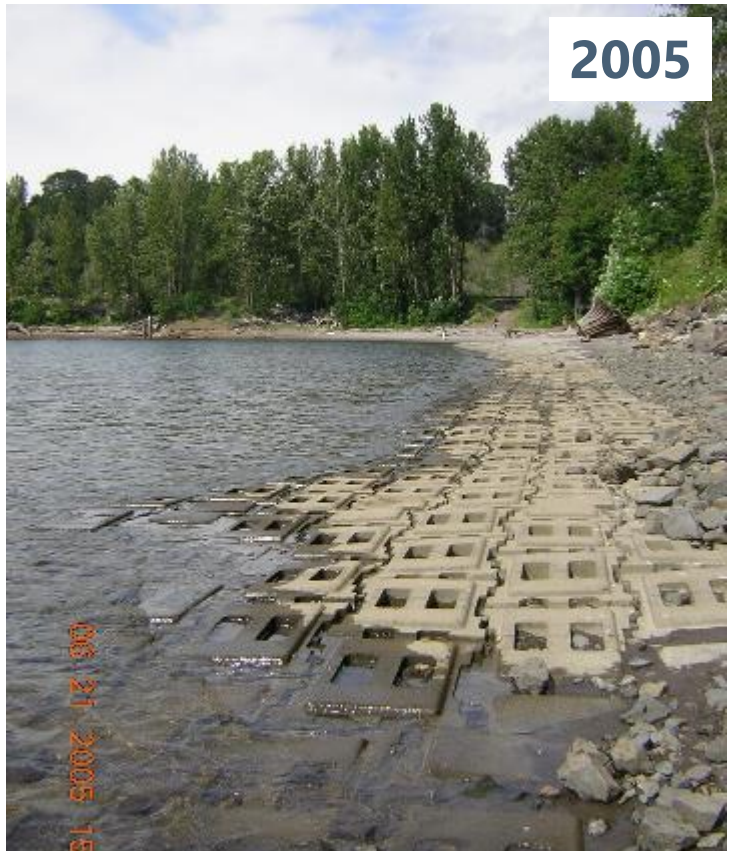
Primary Pre- and Post-Remedy Effectiveness Monitoring Elements

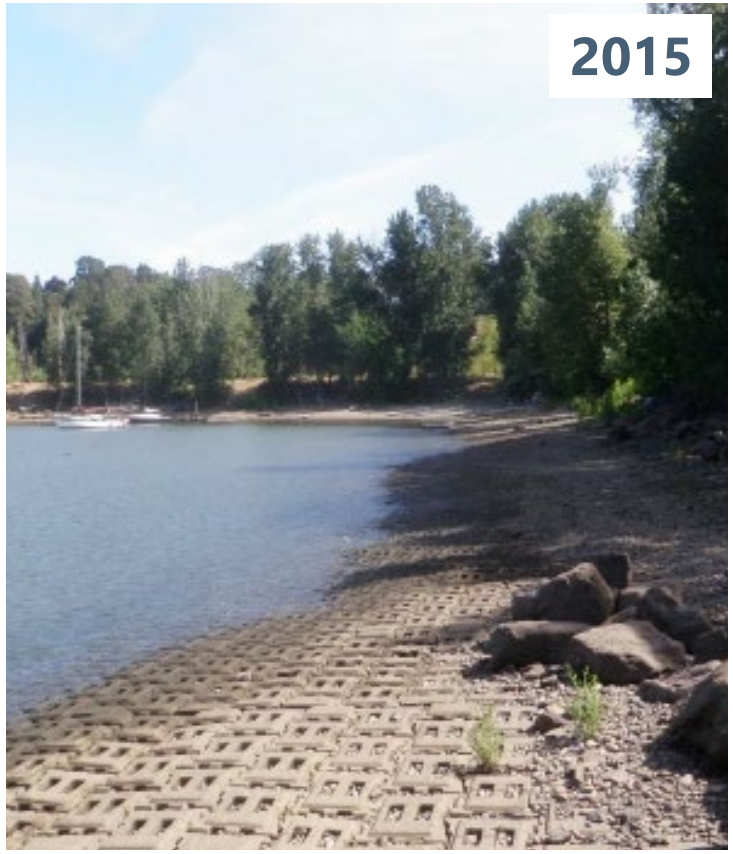
- Crayfish
- Dioxins/furans, PAHs, metals, and PCP



Did the Remedy Achieve Short- and/or Long-Term Remediation Objectives for Surface Sediment?

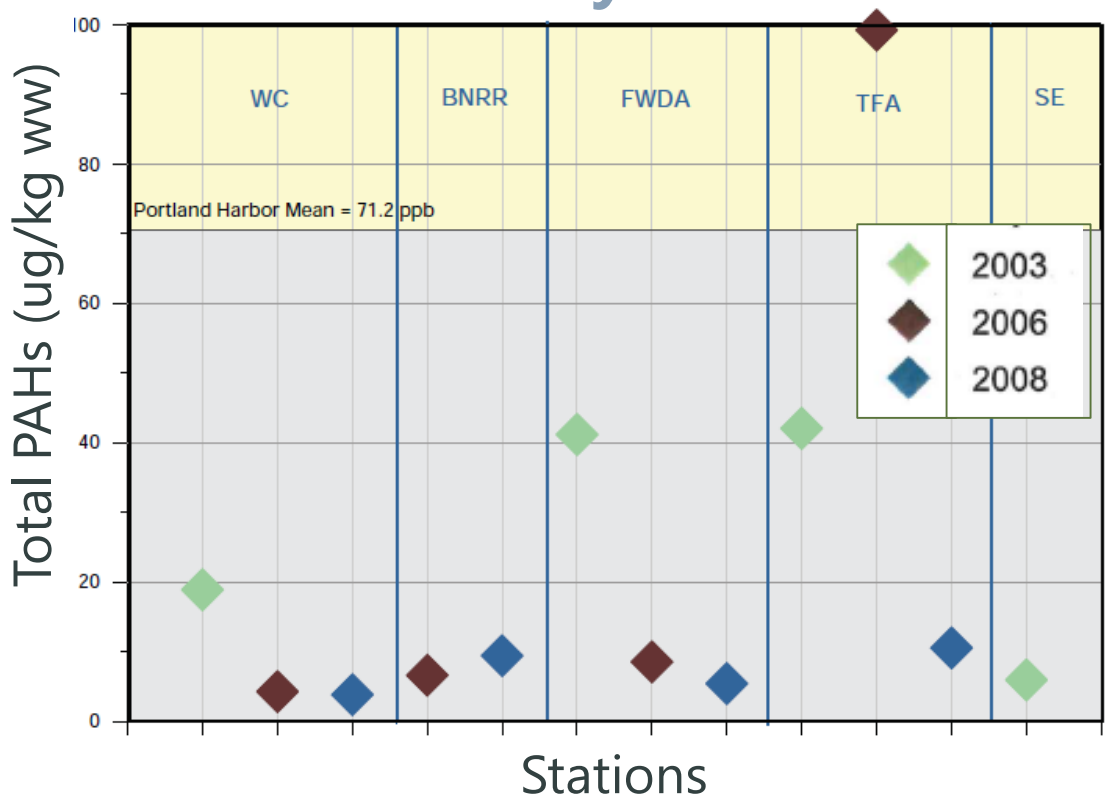




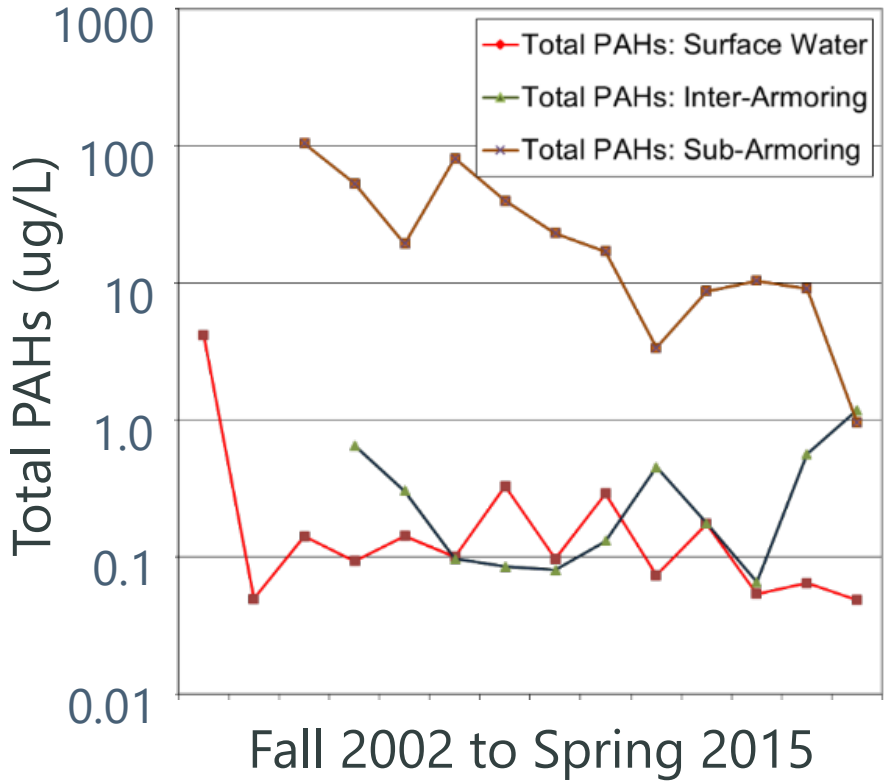


Is the Remedy on Track to Achieve Long-Term Remediation Objectives for Water and/or Biota?

Crayfish



Water



Key Take-Home Messages

- Caps work
- NAPL is a nightmare
- Big rivers require armoring
- Think twice about organoclay
- Long-term monitoring should not be an afterthought

For Reference: Oregon DEQ's Website for McCormick & Baxter