



EPA Support for Adaptive Management at Hanford's 200 West Pump and Treat Facility

Emerald Laija
US Environmental Protection Agency



EPA Support for Optimization

- September 2012: EPA released a *National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion*.
 - Envisions the application of optimization concepts throughout all phases of the remedial process
- Systematic site review at any phase of the cleanup process to:
 - Identify opportunities to improve remedy protectiveness, effectiveness and cost efficiency
 - Facilitate progress toward completion of site work



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EPA Memo – Broaden Use of Adaptive Management (July 2018)

Adaptive management is a formal and systematic site or project management approach centered on rigorous site planning and a firm understanding of site conditions and uncertainties. This technique, rooted in the sound use of science and technology, encourages continuous re-evaluation and management prioritization of site activities to account for new information and changing site conditions. A structured and continuous planning, implementation and assessment process allows EPA, states, other federal agencies, or responsible parties to target management and resource decisions with the goal of incrementally reducing site uncertainties while supporting continued site progress.



Adaptive Management Applications

- Site Level:
 - Upfront planning may consider use of early and interim response actions sitewide to expedite cleanup
 - May help align resources to collect critical information addressing site uncertainties
- Remedial Investigation/Feasibility Study (RI/FS):
 - Target site resources to address key site uncertainties during characterization
 - Use of dynamic work strategies and real-time measurements
 - May reduce data collection costs



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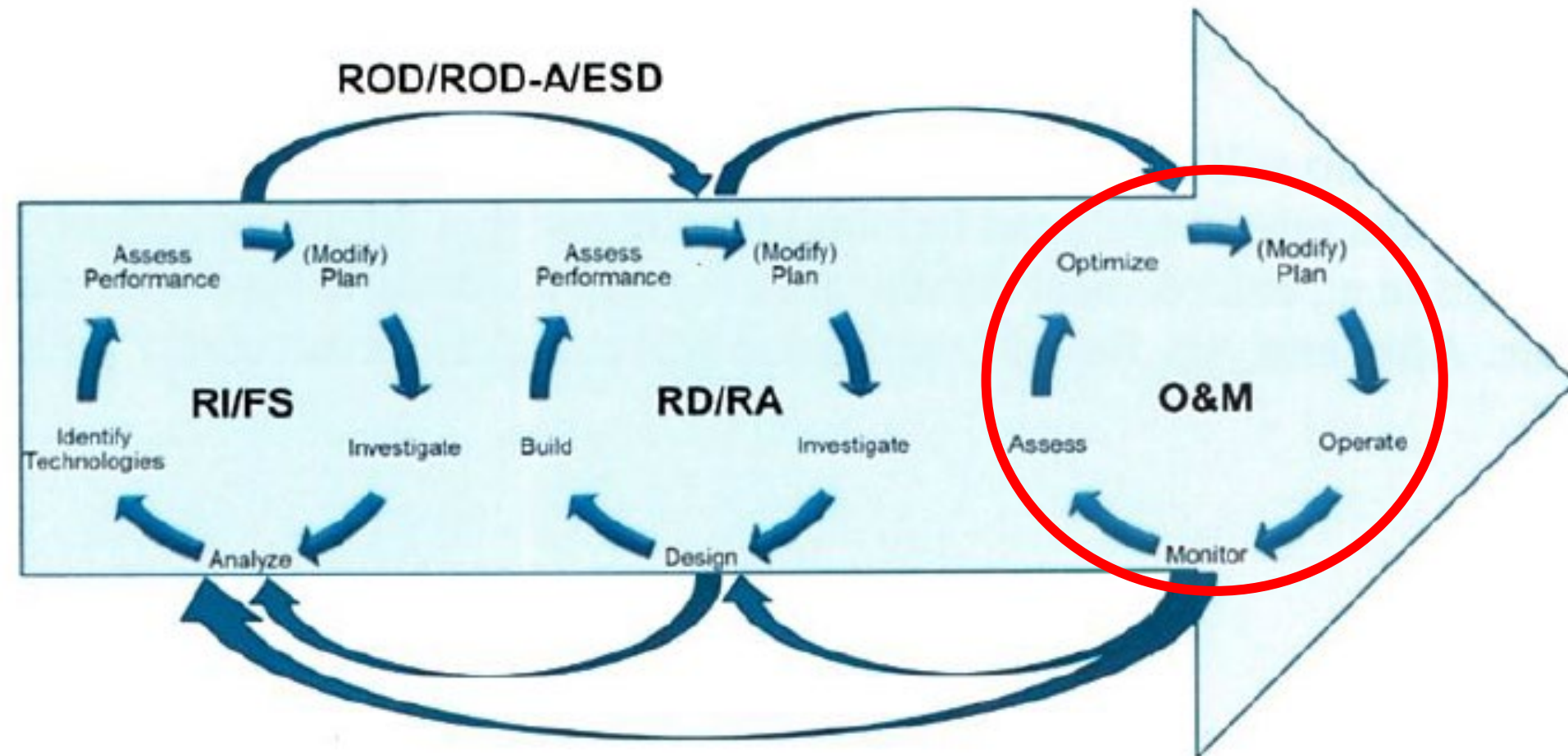


Adaptive Management Applications (Cont.)

- Remedial Design/Remedial Action (RD/RA):
 - Use early in the design process to ensure any additional site characterization and treatability studies are scoped to address key project uncertainties
 - Allow for continuous evaluation and optimization of remedy
- Operations and Maintenance (O&M):
 - Use in remedy operation phase, particularly where remedies are “stuck”
 - Support development of a remediation completion strategy
 - Provide opportunity to rethink project management plan
 - Facilitate development of target data collection, as needed



Figure 1 Adaptive Management's Application in the Superfund Remedial Process



ROD: Record of Decision
ROD-A: Record of Decision Amendment

RD/RA: Remedial Design/Remedial Action
RI/FS: Remedial Investigation/Feasibility Study

EPA Adaptive Management Pilots (2018)

- Bonita Peak Mining District – EPA Region 8
- Ore Knob Mine, Passive Water Treatment System – EPA Region 4
- Baytown Township Ground Water Plume, Strategy to Reach a Final Remedy – EPA Region 5
- 10th Street Site, Groundwater Remedy Completion Strategy – EPA Region 7
- Bunker Hill Mining & Metallurgical Complex, Lower Basin – EPA Region 10
- Naval Undersea Warfare Engineering Station (4 Waste Areas) – EPA Region 10 (Keyport, WA)



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Example: Naval Undersea Warfare Engineering Station (4 Waste Areas) – EPA Region 10

- Location: Keyport, Washington
- Objective: Demonstrate how an adaptive management project management plan can support the development of potential remedial action approaches for a site in operation and maintenance that is not meeting groundwater and surface water goals. This pilot will highlight how project risk management, an element of the adaptive management process, can be used at a complex groundwater site to manage uncertainty.



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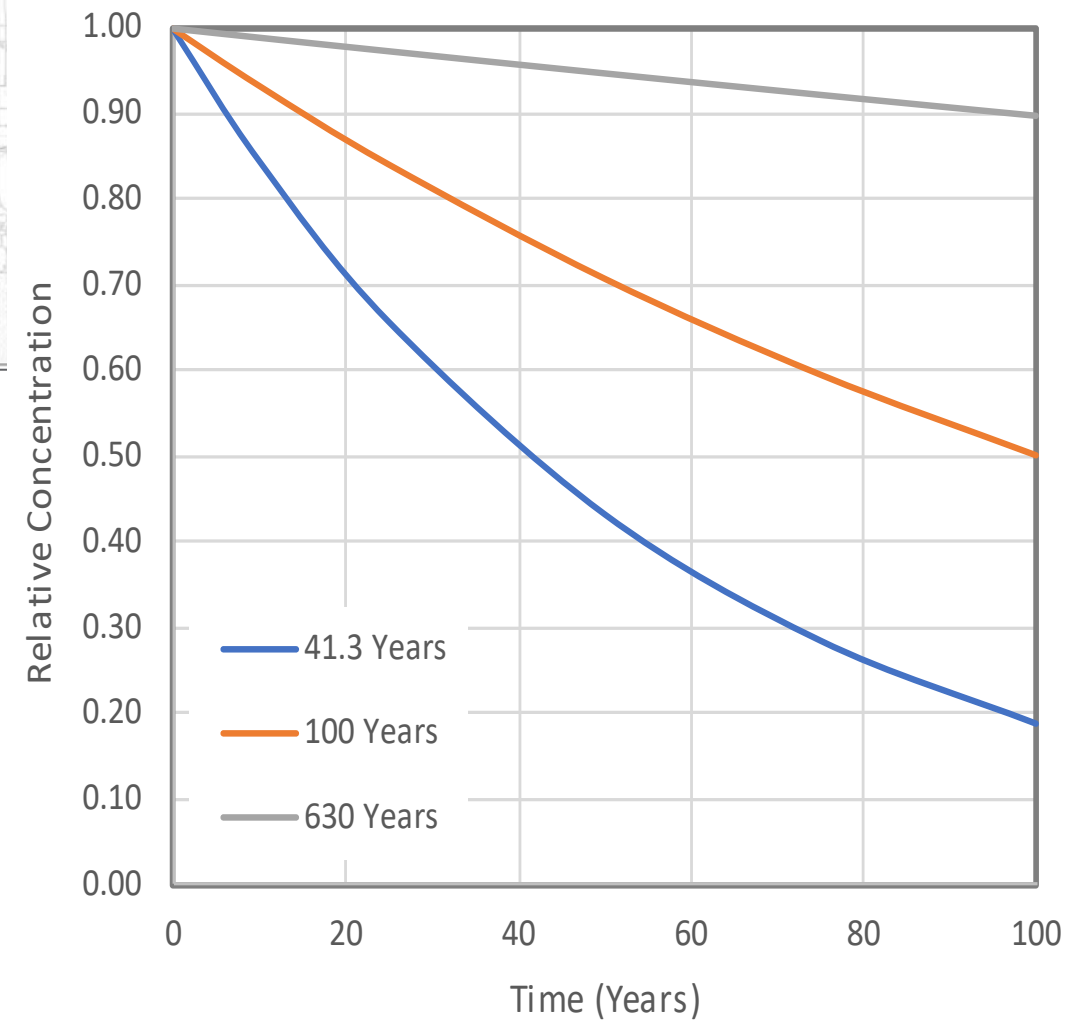
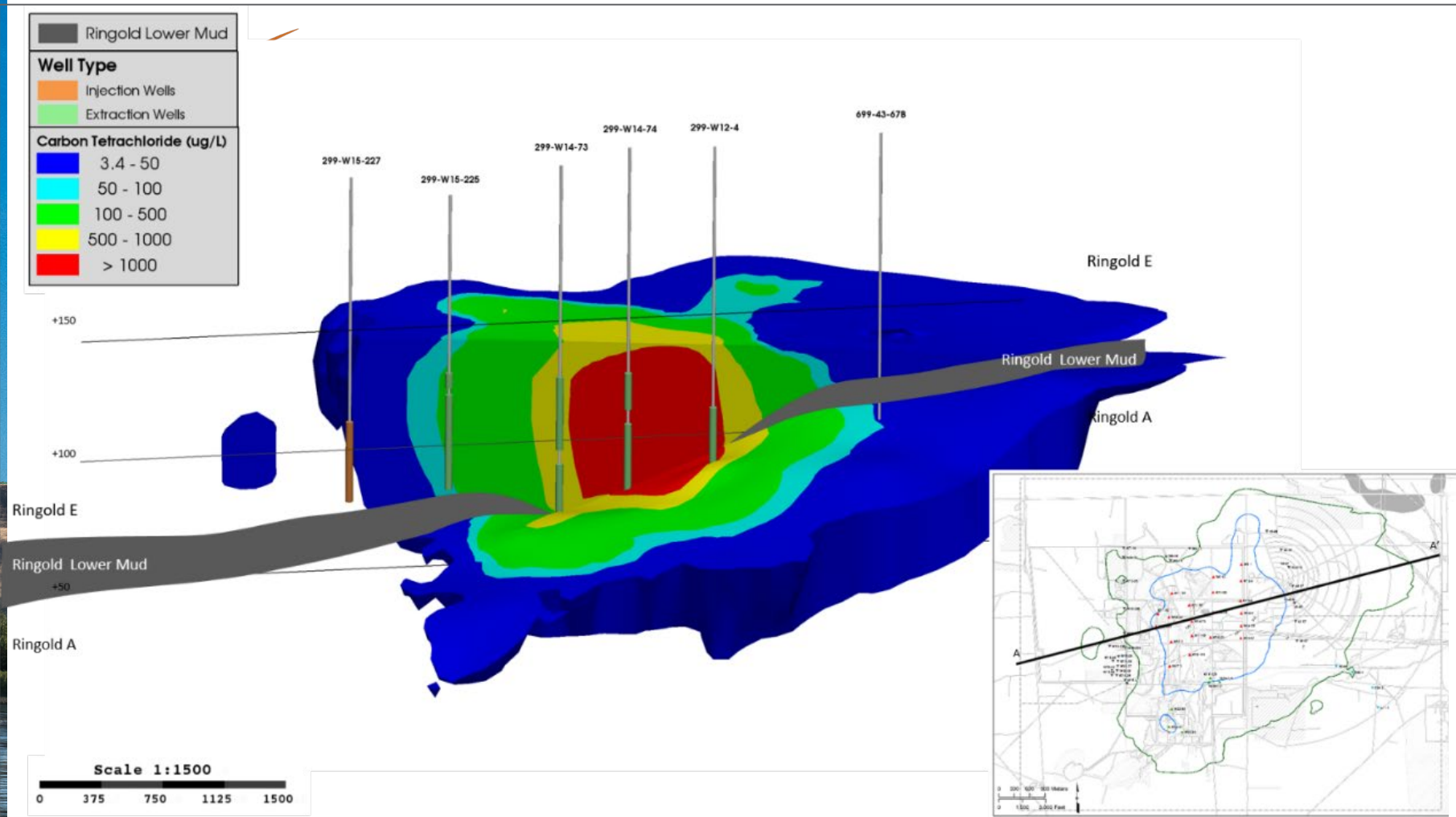


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Changing Conceptual Site Model

- More CCl_4 than originally understood
- Abiotic degradation of CCl_4 (hydrolysis) is slower than FS assumption

Support for Hanford 200 West Optimization

- Suspending biological treatment would enable more efficient approach for increasing CCl₄ treatment capacity and eliminate biofouling in wells
 - Acknowledge remaining nitrate will be addressed through MNA
 - Nitrate behavior will be monitored through optimization study
- Focus on risk-driver by increasing treatment capacity for CCl₄ with an additional air stripper and expanded well network
- Intended to be an iterative process of data evaluation and decision-making



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Lessons Learned

- Relationships between agencies is key to openly discussing optimization and adaptive management strategies
- Regulatory agencies should fully consider the flexibility in remedy implementation
- Lead agency should understand where there are and are not flexibilities in remedy selection and implementation



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Thank you



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