LESSONS LEARNED FROM DESKTOP OPTIMIZATION EFFORT FOR FUDS

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9 May 2018

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PROBLEM STATEMENT

Many Formerly Used Defense Sites (FUDS) Ground Water (GW) Sites
- Hundreds of Sites Requiring Remediation
- Large costs, Long "tails"

Need to "Move the Needle" on accelerating closure, reduce cost to complete

Traditional optimization studies relatively slow, expensive
- Justified for some projects
- USACE optimization process: Remediation System Evaluation (RSE)

Need fast and efficient process to assess FUDS GW sites

PROPOSED APPROACH

Proposed to HQ USACE a rapid "tiger team" approach
- Small team (2 person, senior engineers and geologists)
- Gather key documents (Decision Document, RI, Operational data, cost, etc.)
- Meeting or call with PM/team
- Rapid assessment, brief (2-4 page) memo on findings and recommendations
  - Accelerate closure and reduce cost
  - Identify common/systemic barriers to progress
- Review by district team and possibly their contractor
- May recommend RSE if justified

Pilot test proposed in FY18

PILOT IMPLEMENTATION

Developed standard checklist, report memo outline

Reviewed FUDS GW sites in USACE Northwestern Division

Chose 14 sites based on discussions with division & district FUDS program managers

Studies used readily available documents from internal databases, requested other recent info from PMs
- Decision documents
- Operational reports
- Remedial Investigation reports
- Pilot test reports, etc.

PILOT IMPLEMENTATION, CONTINUED

Teams formed with EM CX engineering & hydrogeology staff

One lead technical person
- Review materials, complete checklist
- Compile plume maps, piezometric maps, cross-sections

Meet with other technical tiger team member
- Discuss conceptual site model
- Review objectives
- Brainstorm

Lead tiger team member drafts memo
- Review by other team member, EM CX PM

Transmit the memo & checklist to district team and division

PILOT IMPLEMENTATION, CONTINUED

Sites considered
- Mostly former intercontinental ballistic missile sites (Atlas, Titan)
- Former munitions manufacturing
- Former Air Force radar site

Contaminants
- Chlorinated solvents
- Explosives

Existing remedies
- In-situ bioremediation, chemical oxidation/reduction
- Pump & treat at manufacturing site
- Monitored natural attenuation

RESULTS AND RECOMMENDATIONS TO DATE

- Sites are making progress, in some cases quite substantial progress
- Contractors taking varied approaches to amendment injection, varied success
  - Direct injection
  - Recirculation
- Ground water circulation as option to accelerate cleanup
- Issues with adequate treatment of source areas
  - Additional (high resolution) characterization or vertical profiling to target treatment
  - Offered alternatives, enhancements to accelerate closure

RESULTS AND RECOMMENDATIONS TO DATE, CONTINUED

- Recommended transition to MNA sites treated to plateau levels (or one additional injection event)
- Difficulties treating fine-grained heterogeneous lithology
  - Address with aggressive technology, better characterization or alternative RAOs
- Monitoring optimization recommendations
- Some sites targeting MCLs for non-potable aquifers (e.g., perched aquifers or low yield shallow unit)
- Costs under $5,000 per site, expect costs to be further reduced

ISSUES IDENTIFIED

- Follow-up and tracking recommendations
  - Follow-up encourages implementation of recommendations
  - Tracking recommendations, implementation for assessing full benefit of effort
  - Still considering tracking mechanism
- MCLs used as standards in all groundwater DD
  - Even when no potential for potable use
  - Anticipated barrier to achieving “Response Complete” by FY21
  - Develop metrics for ending active treatment prior to MNA
  - Recognizing the need to continue long-term management & monitoring of site https://www.itrcweb.org
- Resources for continuation of the effort
  - Planning ~20 sites per FY over 6 years
- Consider training & transfer of injection guidance

CASE STUDY

- Missile Facility in Nebraska
- COCs: TCE and daughter products
- RA: Enhanced Reductive Dechlorination (ERD)
- RAOs: Restore aquifer to DWS shallow and deep
- Issues: Large off site plume
  - Right of Entry limitations
  - Potable wells/residences adjacent to the site
  - MNA will not meet DWS by 2021 timeline
- Recommendations:
  - Use GW recirculation to accelerate cleanup
  - Gain RoE to off site monitoring wells
  - Optimize monitoring program