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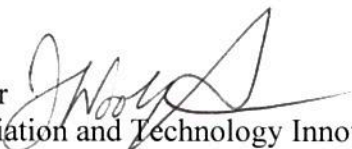
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OLEM 9200.3-120

MEMORANDUM

SUBJECT: Superfund Task Force Recommendation #3: Broaden the Use of Adaptive Management

FROM: James E. Woolford, Director 
Office of Superfund Remediation and Technology Innovation

TO: Superfund National Program Managers, Regions 1-10

PURPOSE

This memorandum's purpose is to provide a working definition of adaptive management (AM) and to outline an implementation plan to expand AM's use at Superfund remedial sites. The U.S. Environmental Protection Agency's (EPA's) Superfund Task Force recommended such an expansion in its July 2017 report to improve and to accelerate the Superfund cleanup process.

BACKGROUND

In May 2017, EPA Administrator Scott Pruitt established a task force and charged it with developing recommendations to, among other objectives, identify strategies for restructuring the Superfund cleanup process to expedite cleanups. One of the Task Force's recommendations called for the Agency to "broaden the use of adaptive management at Superfund sites" to focus "...limited resources on making informed decisions throughout the remedial process."

To implement the Task Force's AM recommendation, the Superfund remedial program established an AM workgroup comprised of regional Superfund program office representatives as well as Headquarters representatives from the Office of Superfund Remediation and Technology Innovation (OSRTI), Office of Site Remediation Enforcement, and Federal Facility Restoration and Reuse Office. Through regular meetings, the workgroup developed a working AM definition and outlined an approach for piloting the management technique's application at Superfund site(s). The workgroup's pilot will help inform how best to apply AM to the

Superfund site remediation process while operating within the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and Superfund policy and guidance. We most recently discussed this work at the May 2018 Superfund division directors meeting in Denver, Colorado.

ADAPTIVE MANAGEMENT OVERVIEW

Federal and state agencies, corporations and research institutions (e.g., National Academies of Science) have developed various AM definitions since the approach was first developed for natural resources management in the 1970s. Since that time, different federal and state agencies as well as private corporations have defined AM in similar ways. The AM workgroup reviewed these definitions and developed the following working definition:

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 (OFAs), or responsible parties (PRPs) to target management and resource decisions with the goal of incrementally reducing site uncertainties while supporting continued site progress.

The Task Force's AM recommendation focused on its application at large and/or complex Superfund sites where limited resources, varying stakeholder perspectives, and lack of consensus on priorities can hinder decision making and slow site progress. At such sites, upfront planning and formal documentation can help:

- Build stakeholder consensus by capturing all stakeholders' interests and priorities;
- Ensure:
 - Consistency with good engineering practices and
 - Adherence to regulatory requirements; and
- Establish transparent documentation of project uncertainties/risks and the management approach to address them.

Within the Superfund remedial program, AM strategies can have applications at a:

Site level where they can be employed early in the Superfund site characterization and remediation process to help ensure stakeholder input and consensus on a high-level site strategy or approach. This upfront planning may consider, for example, how early or interim response actions may be implemented throughout the sitewide remedial investigation/feasibility study (RI/FS) to eliminate, reduce, or control site hazards or to expedite completion of site cleanup. Early understanding of how such actions may be considered during the RI/FS can help align resources to collect information critical to addressing key site uncertainties, identify how response action outcomes will be evaluated and inform future management decisions, and ensure information is sufficient

to support CERCLA and NCP-consistent remedy decisions for all early, interim, or final response actions.

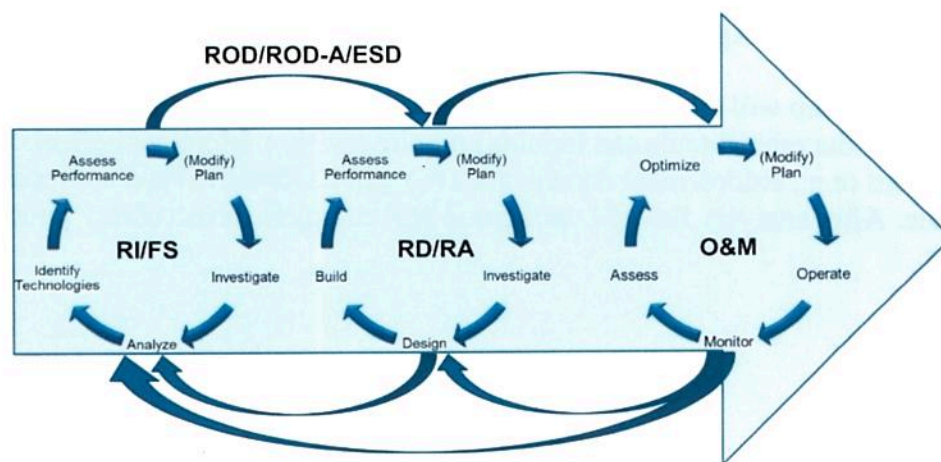
Such approaches can also have applications at a **project level**; for example, application of AM can occur during an:

RI/FS project to support a Triad approach. This application can ensure the targeting of site resources to address key site uncertainties using dynamic work strategies and real-time measurement technologies. These efforts can reduce data collection costs and ensure data collection efforts throughout the investigation process support the analysis of remedial technologies and the development of an appropriate suite of project-specific remedial alternatives.

RD/RA project early in the design process to ensure site characterization and treatability study activities are scoped to address key project uncertainties. For example, EPA could select, in a CERCLA decision document, a combination of technologies to treat dense non-aqueous phase liquid source material and contaminated groundwater. Information collection and analysis can inform a final design with the appropriate level of specificity and performance metrics. A design with such characteristics supports a flexible remedial action contracting strategy, allowing the contractor to continuously evaluate and optimize remedy implementation and performance, thus maximizing the use of multiple technologies to expedite remedial action completion.

O&M project to move sites “stuck” in remedy operation towards completion. Specifically, AM can support the development of a remedy completion strategy and provide an opportunity for rethinking the project management plan. It can also facilitate development of clear criteria for targeted data collection and technology evaluation to inform the need to change or modify the remedial approach.

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



ROD: Record of Decision
 ROD-A: Record of Decision Amendment
 ESD: Explanation of Significant Differences

RD/RA: Remedial Design/Remedial Action
 RI/FS: Remedial Investigation/Feasibility Study
 O&M: Operation and Maintenance

IMPLEMENTATION

Based on the workgroup's efforts, OSRTI recommends that regions use a formal AM process to ensure site and project management efforts are clearly documented, transparent and easily transferrable between sites. A formal process requires the development of standard tools and templates to support process implementation, including site management plans, and to support procedures for conducting project uncertainty analysis, such as project risk management tools and use of conceptual site models.

The Office of Superfund Remediation and Technology Innovation recognizes that a formal AM process necessitates development of: additional site documentation, a documented project risk management process, and Superfund staff and stakeholder training. Although these efforts may require additional resource investments, such investments will benefit the Superfund remedial program by supporting transparency and by documenting resource allocation decisions throughout the process. Adoption of a formal AM process will also bring key project uncertainties to the forefront of resource decision-making, especially at large and/or complex Superfund remedial sites.

To ensure these tools and trainings provide the necessary detail and support to implementers as well as to maximize successful Superfund AM implementation, OSRTI, working with the regions, will use a two-phase implementation process. This process will allow regions to pilot AM at Superfund remedial sites, to conduct post-pilot evaluation of its effectiveness, and to use lessons learned to develop an AM guidance.

Phase 1 – Superfund Site Pilots.

The AM workgroup will: develop AM pilot criteria, define pilot success and develop evaluation metrics, and confer with states, tribes and other stakeholders when identifying and selecting pilots. Selected pilots will use AM at either the site or project level.

Phase 2 – Implement Appropriate Policy.

The AM workgroup will evaluate pilots to determine if the proposed formal AM Superfund process and/or the related tools and trainings require revision. Moreover, effects on other program areas (e.g., enforcement documents, etc.) will be identified and addressed as appropriate. After analysis, the AM workgroup will complete the necessary policies or directives.

NEXT STEPS

Below is an outline of next steps and anticipated completion dates. These dates and activities are subject to change as plan implementation continues to unfold.

Timeframe	Action
End of July 2018	Create draft final pilot criteria; draft tools, evaluation metrics and measures of success. Disseminate draft products to regional programs for review and comment.
August 2018	Revise criteria and other draft products based on regional feedback.
September 2018	Coordinate/consult with states, tribes and other appropriate stakeholders.
October 2018	Solicit regions for pilot projects.
November 2018	Select pilots to apply formal AM at a variety of sites/projects.
April 2019	Review 6-month status and preliminary feedback from pilots. Determine preliminary scope of formal guidance and begin drafting. Identify any potential impacts to existing policy.
October 2019	Review 1-year status of pilots and incorporate lessons learned into draft guidance.
December 2019	Finalize guidance.

CLOSING

If you have any questions on the AM Task Force Implementation Plan or AM generally, please contact me or the Recommendation 3 lead, Kate Garufi, at garufi.katherine@epa.gov or 703-517-5857.

cc: Barry Breen/OLEM
Steven Cook/OLEM
Veronica Darwin/AO
Reggie Cheatham/OEM
Paul Leonard/FFRRO
Cyndy Mackey/OSRE
John Michaud/OGC
Karin Leff/FFEO
Regional Counsels, Regions 1-10
Regional Remedial Branch Chiefs, Regions 1-10
NARPM Co Chairs
Brigid Lowery/OSRTI
Pam Barr/OSRTI
Bob Jennings/OSRTI

