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Systematic Planning Processes for the Removal Program

Office of Emergency Management
Office of Superfund Remediation and Technology Innovation

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The Office of Solid Waste and Emergency Response (OSWER) is revising its 1990 *Quality Assurance/Quality Control Guidance for Removal Activities* to address changes in Agency-wide quality assurance policies and guidance documents. Environmental data collection operations should be designed using a systematic planning process that is based on the scientific method. The planning process should be based on a common sense, graded approach to ensure that the level of detail in planning is commensurate with the importance and intended use of the results and the available resources. EPA has developed a systematic planning process called the Data Quality Objectives (DQO) Process. While not mandatory, this process is the recommended planning approach for many EPA data collection activities, such as when environmental data are used to select between two opposing conditions. Other Federal agencies have tailored the DQO process or have developed their own systematic planning and decision support processes. Many of them are directly related to environmental operations, and may be useful to EPA decision makers (e.g. On-Scene Coordinators) when planning and implementing removal operations.

INTRODUCTION

In April 1990, the Office of Emergency and Remedial Response (OERR) prepared the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01, *Quality Assurance/Quality Control Guidance for Removal Activities* (the Removal Guidance), which was based on then-current Agency-wide quality assurance (QA) policies.

Since then, the following Agency-wide quality documents were issued in May 2000:

- EPA Order 5360.1 A2, *Policy and Program Requirements for the Mandatory Agency-Wide Quality System* (the revised Quality Order); and
- EPA 5360 A1, the *EPA Quality Manual for Environmental Programs* (the Quality Manual).

In addition, beginning in 1997, OSWER spearheaded an Intergovernmental Data Quality Task Force (IDQTF) to address issues related to the management of environmental data quality at Federal facilities. The IDQTF has produced the *Uniform Federal Policy for Implementing Environmental Quality Systems* and the multi-part *Uniform Federal Policy for Quality Assurance Project Plans* (UFP-QAPP). OSWER has adopted the UFP-QAPP for federal facility hazardous waste activities and highly recommends that it be considered more broadly for data collection projects conducted under Superfund. Regions are strongly encouraged to consider the use of the UFP-QAPP for other purposes. (See OSWER 9272.0-17.)

OSWER has recognized the need to update the Removal Guidance in light of these Agency-wide and OSWER-specific policy changes as well as organizational changes within OSWER through 2004.* As part of the process of revising the Removal Guidance, the Office of Emergency Management (OEM) and the Office of Superfund Remediation and Technology Innovation (OSRTI) are issuing three QA Technical Information Bulletins focusing on some of the more significant QA changes now impacting the Removal Program. †

* In January 2003, the Assistant Administrator of OSWER proposed an organizational structure to better meet new responsibilities related to homeland security. The organizational change included moving the emergency response (including emergency and time-critical removals) and oil spill programs, then in OERR, into the Chemical Emergency Preparedness and Prevention Office (CEPPO), and the Technology Innovation Office (TIO) into OERR. The final phases of the reorganization were completed by January 2004 for the former OERR, now renamed the Office of Superfund Remediation and Technology Innovation (OSRTI), and by September 2004 for the former CEPPO, now renamed the Office of Emergency Management (OEM).

† The discussion in this document is intended solely as guidance. This document is not a regulation. It does not impose binding legal requirements. EPA retains the right to adopt approaches on a case-by-case basis that differ from those described in this guidance, where appropriate. This guidance document interprets Agency policies on QA. This guidance document may be revised without notice.

SYSTEMATIC PROJECT PLANNING

Environmental data operations should be designed using a systematic planning process that is based on the scientific method. The concept of the scientific method is to make an observation, create a hypothesis based on what was observed, use the hypothesis to make a prediction, and test the hypothesis. One should continue to test until there are no discrepancies between the hypothesis and the results.

One example of the scientific method being used in an environmental data collection operation is the following. An On-Scene Coordinator (OSC) *observes* there has been a fire at a warehouse, firefighters have responded, and water run-off from the warehouse has flowed into a storm drain. The OSC *hypothesizes* there has been a release of hazardous chemicals from the warehouse and *predicts* that the release has entered into the storm drain extending 100 feet from the point of entry. The OSC *tests* this hypothesis by sampling the storm sewer at points both less than and greater than 100 feet through the sewer line. Based on the results of these tests, the OSC obtains a definitive answer (the presence and extent of contamination) or refines the hypothesis and tests again.

Practical Considerations in Systematic Planning

The planning process should be based on a common sense, graded approach to ensure that the level of detail in planning is aligned with the importance and intended use of the results and the available resources. The EPA Quality Manual, amended May 2000, identifies elements of a systematic planning approach, consisting of the following:

- Identification and involvement of the project manager, sponsoring organization and responsible official, project personnel, stakeholders, scientific experts, etc. (i.e., all customers and suppliers);
- Description of the project goal, objectives, and questions and issues to be addressed;
- Identification of project schedule, resources (including budget), milestones, and any applicable requirements (e.g., regulatory requirements, contractual requirements);
- Identification of the type of data needed and how the data will be used to support the project's objectives;
- Determination of the quantity of data needed and specification of performance criteria for measuring quality;
- Description of how, when, and where the data will be obtained (including existing data) and identification of any constraints on data collection;
- Specification of needed QA/QC activities to assess the quality performance criteria (e.g., QC samples for both the field and laboratory, audits, technical assessments, performance evaluations, etc.); and
- Description of how the acquired data will be analyzed (either in the field or the laboratory), evaluated (i.e., QA review, validation, verification), and assessed against its intended use and the quality performance criteria.

A systematic planning process ensures that all organizations and/or parties who contribute to the quality of the environmental program or use the results are identified and that they participate in this process. The planning process also provides for direct communication between the customer and the supplier to ensure that there is a clear understanding by all participants of the needs and expectations of the customer and the product or results to be provided by the supplier.

OPTIONAL PROCESSES

Although there should be a systematic planning process, no single process is required or is best in all cases. There are several processes that a project manager can choose from. Some of these are summarized below.

EPA's Data Quality Objectives (DQO) Process – EPA has developed a systematic planning process called the DQO Process. While not mandatory, this seven-step process is the recommended planning approach for many EPA data collection activities, such as when environmental data are used to select between two opposing conditions. The steps are as follows:

- Step 1. State the problem;
- Step 2. Identify the goals of the study;
- Step 3. Identify information inputs;
- Step 4. Define the boundaries of the study;
- Step 5. Develop the analytic approach;
- Step 6. Specify performance or acceptance criteria; and
- Step 7. Develop the plan for obtaining data.

The DQO Process is described in several guidance documents:

- EPA QA/G-4, *Guidance for the Data Quality Objectives Process*, EPA/240/B-06/001, February 2006;
- EPA QA/CS-1, *Systematic Planning: A Case Study for Hazardous Waste Site Investigations*, EPA/240/B-06/004, February 2006; and
- OSWER Directive 9355.9-01, *Data Quality Objectives Process for Superfund*, EPA/540/R-93/071, September 1993.

As stated above, the DQO Process is not mandatory. However, it is the only Agency-wide systematic

planning process described to date.‡ Other Federal agencies have tailored the DQO process or have developed their own systematic planning and decision support processes. Many of them are directly related to environmental operations, and may be useful to EPA decision makers (e.g., OSCs) when planning and implementing removal operations.

Some example processes include the following:

UFP-QAPP Systematic Planning Process – This process was designed to ensure conformance to the American National Standard adopted by EPA through its Quality Order. (The standard is ANSI/ASQC E4-1994, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*.) Part 1 of the UFP-QAPP document series describes planning elements that are similar to the DQO process. These elements include the following:

- Establishment of a team-based approach to planning;
- Description of the project goal, objectives, and questions and issues to be addressed;
- Identification of project schedule, resources (including budget) milestones, and any applicable requirements;
- Matching of the data collection and analysis process to project objectives;
- Identification of collection and analysis requirements; and
- Description of the generation, evaluation, and assessment of collected data.

Each element has at least one specific planning step associated with it. For more information, see Table 1 and companion text in IDQTF's *Uniform Federal Policy for Quality Assurance Project Plans, Part 1: UFP-QAPP Manual*, EPA-505-B-04-900A, Version 1, March 2005 [Contact: Mike Carter, (703) 603-0046].

U.S. Army Corps of Engineers' Technical Project Planning (TPP) Process – The USACE's TPP process was also designed to ensure conformance to ANSI/ASQC E4-1994 and simplify EPA's planning requirements. The TPP process consolidates the DQO Process into the following four phases:

- Phase I: Identify Current Project;
- Phase II: Determine Data Needs;
- Phase III: Develop Data Collection Options; and
- Phase IV: Finalize Data Collection Program.

Compared to the DQO Process, the TPP process activities, guidance, and tools provide more explicit guidance in designing a data collection program for a site. TPP can be used when planning any activities at a site (i.e., site investigation; design; construction, operation and maintenance; or long-term monitoring). This process is described in *Technical Project Planning (TPP) Process*, EM 200-1-2, U.S. Army Corps of Engineers, August 31, 1998 [Contact: Larry Becker, (202) 761-8882].

U.S. Department of Energy (DOE) Streamlined Approach for Environmental Restoration (SAFER) – DOE developed SAFER as a methodology tailored to the challenges of conducting environmental restoration efforts under conditions of significant uncertainty. SAFER was developed primarily by integrating the DQO Process with the Observational Approach (OA), or "learn-as-you-go." SAFER does not use the "seven step" format explicitly, but implicitly incorporates the process in describing the steps in Remedial Investigation/Feasibility Study (RI/FS) planning through to the Remedial Design/Remedial Action (RD/RA) phase of environmental restoration. SAFER was developed for use in streamlining the iterative process between determining the type and extent of contamination at a site and identifying and evaluating cleanup alternatives. It is a corollary to EPA's Superfund Accelerated Cleanup Model (SACM). This process is described in "Streamlined Approach for Environmental Restoration (SAFER)" in *Remedial Investigation/Feasibility Study (RI/FS) Process, Elements and Technical Guidance* (EH 94007658), Environmental Management, December 1993 [Contact: Analytical Services Division, (301) 427-1677].

Bureau of Reclamation's Decision Process – The U.S. Bureau of Reclamation's Decision Process is broader in scope and designed to be used for a variety of operations, environmental or otherwise. It integrates the spirit of the DQO Process (using eight steps for planning) and continues the process through implementation and follow-up. Case studies available include a National Environmental Policy Act compliance study and a study on environmental indicators, demonstrating its flexibility. This process is described in *Decision Process Guidebook (How to Get Things Done in Government)*, Bureau of Reclamation [Contact: Thayne Coulter, (303) 445-2706].

The Triad Approach/Framework – Like the U.S. Bureau of Reclamation's Decision Process, the systematic planning performed for Triad projects is broader in scope than data collection, and is heavily focused on site remedial or closeout decision-making. Triad encourages the use of conceptual site models(CSMs) to aid understanding of contaminated sites.§ Information on Triad's systematic project

‡ EPA Quality Staff had made available for peer review a draft guidance document describing the "Performance and Acceptance Criteria (PAC) Process" in *Guidance on Systematic Planning for Environmental Data Collection Using Performance and Acceptance Criteria* (EPA QA/G-4A), Peer Review Draft, October 2002. By April 2003, however, this peer review draft was removed from Quality Staff's public Web site due to extensive revisions needed. By March 2004, EPA Quality Staff had decided not to revise and reissue EPA QA/G-4A as a separate document but to incorporate its information into the next revision of EPA QA/G-4, which was issued in February 2006.

§ CSM is a depiction of the contaminated site of interest and addresses contaminant release, migration, and potential exposure receptors.

planning and Triad case studies are available through the Triad Resource Center Web site at www.triadcentral.org [Contact: Deana Crumbling, (703) 603-0643].

Each of these five processes meets the eight elements of systematic planning described in the Quality Manual and included above. This is not intended to be an exhaustive list. Other processes may be more suitable to Removal Program staff in the Regions.

IDENTIFICATION OF SUPERFUND DATA CATEGORIES

Regardless of the process selected, completion of one of the planning process elements should include the identification of the Superfund data category or categories applicable to data to be generated during the removal event and the subsequent decisions. (That element is "identification of the type of data needed and how the data will be used to support the project's objectives.") A separate QA Technical Information Bulletin, *Applicability of Superfund Data Categories to the Removal Program*, discusses these Superfund data categories more thoroughly.

REGIONAL POLICIES ON SYSTEMATIC PLANNING

It is important that the Regional Quality Management Plan describe the process for project planning in the Removal Program. This should include identification of who is responsible and how project planning will be documented.

The results of systematic planning are typically documented in a QA Project Plan. A separate QA Technical Information Bulletin, *Changes in Quality Assurance Policies for the Removal Program*, describes the contents and QA Project Plan documentation for removals in more detail.

REFERENCES

1. Intergovernmental Data Quality Task Force, *Uniform Federal Policy for Implementing Environmental Quality Systems*, EPA-505-F-03-001, Version 2, March 2005.
2. Intergovernmental Data Quality Task Force, *Uniform Federal Policy for Quality Assurance Project Plans, Part 1: UFP-QAPP Manual*, EPA-505-B-04-900A, Version 1, March 2005.
3. U.S. Department of Army, *Technical Project Planning (TPP) Process*, EM 200-1-2, U.S. Army Corps of Engineers, August 31, 1998.
4. U.S. Department of Energy, "Streamlined Approach for Environmental Restoration (SAFER)" in *Remedial Investigation/Feasibility Study (RI/FS) Process, Elements and Technical Guidance* (EH 94007658), Environmental Management, December 1993.
5. U.S. Department of Interior, *Decision Process Guidebook (How to Get Things Done in Government)*, Bureau of Reclamation, http://www.usbr.gov/pmts/guide/.
6. U.S. Environmental Protection Agency, *Data Quality Objectives Process for Superfund* (Interim Final Guidance), (EPA 540/R-93-071), Office of Emergency and Remedial Response, September 1993.
7. U.S. Environmental Protection Agency, *EPA Quality Manual For Environmental Programs*, EPA Manual 5360 A1, Office of Environmental Information, May 2000.
8. U.S. Environmental Protection Agency, *Policy And Program Requirements For The Mandatory Agency-wide Quality System*, EPA Order 5360.1 A2, May 5, 2000.
9. U.S. Environmental Protection Agency, *Implementation of the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) at Federal Facility Hazardous Waste Sites*, Memorandum from Thomas P. Dunne, Deputy Assistant Administrator, Office of Solid Waste and Emergency Response, to Regional Administrators, Regions I–X, OSWER Directive 9272.0-17, June 7, 2005.
10. U.S. Environmental Protection Agency, *Guidance For The Data Quality Objectives Process*, EPA QA/G-4 (EPA/240/B-06/001), Office of Environmental Information, February 2006.
11. U.S. Environmental Protection Agency, *Systematic Planning: A Case Study for Hazardous Waste Site Investigations*, EPA QA/CS-1 (EPA/240/B-06/004), Office of Environmental Information, February 2006.
12. U.S. Environmental Protection Agency, *Triad Resource Center*, http://www.triadcentral.org/
13. U.S. Environmental Protection Agency, *Applicability of Superfund Data Categories to the Removal Program*, Quality Assurance Technical Information Bulletin, July 2006.
14. U.S. Environmental Protection Agency, *Changes in Quality Assurance Policies for the Removal Program*, Quality Assurance Technical Information Bulletin, July 2006.