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Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties

Interim Final

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Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
Washington, DC 20460

Notice

Development of this document was done by the Environmental Protection Agency (EPA). It has been subjected to the Agency's review process and approved for publication as an EPA document.

The guidance and procedures set out in this document are intended solely for the guidance of EPA Superfund remediation personnel. They are not intended, nor can they be relied upon, to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. The Agency reserves the right to act at variance with these policies and procedures and to change them at any time without public notice.

Foreword

This Interim Final Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties was issued in order to ensure that selected remedies being conducted are protective of public health and the environment, and that the Remedial Actions are in compliance with the applicable performance standards. It provides guidance for oversight when EPA is the lead agency on a project in which a Potentially Responsible Party conducts the Remedial Design and Remedial Action.

This guidance does not cover projects when the Remedial Design and Remedial Action is performed with Superfund monies in which the EPA or the State is the lead agency. This will be the subject of future guidance documents.

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Christine Beling . . . . . EPA, HSCD
Michael Peterson . . . . . EPA, HSCD

The following Regional, Headquarters, and US Army Corps of Engineers (USACE) individuals contributed by participating as members of the initial peer review work group:

Ira Leighton . . . . . EPA, Region I
Laura Boornazian . . . . . EPA, Region III
Cindy Nolan . . . . . EPA, Region V
Brad Bradley . . . . . EPA, Region V
Loren McPhillips . . . . . EPA, Region X

Russel Wyer . . . . . EPA, HSCD
Ken Ayers . . . . . EPA, HSCD
Sandra Connors . . . . . EPA, OECM
Pat Winfrey . . . . . EPA, OECM
Patty Bubar . . . . . EPA, OWPE
Ross Natoli . . . . . EPA, OWPE

Jack Mahon . . . . . USACE
Noel Urban . . . . . USACE
Edward Watling . . . . . USACE

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Acronyms Used in This Guidance

ARAR	-	Applicable or Relevant and Appropriate Requirement
ARCS	-	Alternative Remedial Contracting Strategy
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
EPA	-	Environmental Protection Agency
FSP	-	Field Sampling Plan
HSCD	-	Hazardous Site Control Division
OECM	-	Office of Enforcement and Compliance Monitoring
OERR	-	Office of Emergency and Remedial Response
O&M	-	Operation and Maintenance
OSWER	-	Office of Solid Waste and Emergency Response
OWPE	-	Office of Waste Programs Enforcement
PRP	-	Potentially Responsible Party
QA	-	Quality Assurance
QC	-	Quality Control
RA	-	Remedial Action
RD	-	Remedial Design
RD/RA	-	Remedial Design and Remedial Action
RI/FS	-	Remedial Investigation/Feasibility Study
ROD	-	Record of Decision
RPM	-	Remedial Project Manager
SARA	-	Superfund Amendments and Reauthorization Act of 1986
USACE	-	US Army Corps of Engineers

Executive Summary

This document presents the Environmental Protection Agency's (EPA) guidance for oversight by Remedial Project Managers (RPMs) on enforcement lead projects in which a Potentially Responsible Party (PRP) conducts the Remedial Design and Remedial Action. The objectives of PRP oversight are to ensure that selected remedies being conducted by the PRP are protective of public health and the environment, and that the Remedial Actions are in compliance with the Settlement Agreement. The Hazardous Site Control Division within EPA has developed a focused approach to PRP oversight that assists RPMs in concentrating their efforts on the most significant aspects of the projects.

The successful implementation of the focused approach consists of two steps. First, the RPM must focus on certain key documents developed throughout the design and construction of the remedy such as the Remedial Design and Remedial Action Work Plans, project schedules, preliminary design, final design, Construction Quality Assurance and Quality Control Plans, and the Contingency Plan. The second step in the focused approach is the utilization by the RPMs of an Independent Quality Assurance Team during construction. The impact of the focused approach is to allow RPMs to utilize their oversight activities in a more efficient manner, enabling them to more effectively monitor PRP activities. The ultimate goal of PRP oversight is to hold PRPs responsible and accountable for the Remedial Actions.

CHAPTER 1

INTRODUCTION

1.1 PURPOSE OF THIS GUIDANCE

When a Potentially Responsible Party (PRP) elects to conduct the Remedial Design and Remedial Action (RD/RA) activities at a Superfund site, they must do so in accordance with the terms of the negotiated Settlement Agreement (either an administrative order on consent or a judicial consent decree) per Section 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Subsequently, PRPs and their agents are responsible for the adequacy of the design and the implementation of remedies specified. During an enforcement lead cleanup, the primary function of the Environmental Protection Agency (EPA) is to ensure PRPs comply with all applicable laws, regulations, and requirements, and meet all performance standards specified in the Settlement Agreement. The purpose of this guidance is to provide an overview of the general sequence of events that occur during a PRP conducted RD/RA. It also provides guidance on the specific roles and responsibilities of the EPA Remedial Project Manager (RPM) and the Oversight Official.

1.2 OVERVIEW OF THIS GUIDANCE

EPA has two objectives for overseeing PRP conducted RD/RAs on enforcement lead cleanups:

- Ensure the remedies are protective of public health and the environment throughout the life of the project; and

- Ensure the Remedial Action (RA) is implemented in compliance with the terms of the Settlement Agreement.

The intent of the oversight program is to focus EPA efforts on the most significant aspects of the project, such as overall quality assurance (QA), scheduling, major changes due to changed field conditions, emergency actions, and project close out. EPA must use a high level of oversight at the onset of the Remedial Design (RD) and again when the Remedial Action is initiated. The amount of oversight effort may be increased or decreased over time, depending on the capabilities of the PRPs' design and construction teams, the implementation of a construction quality assurance program, the nature of the technology selected, and the provisions

of the Settlement Agreement. The oversight must always be structured so the PRPs, not EPA, remain legally responsible and accountable for the success of the response action.

The reason for allowing PRPs to conduct RD/RA is to place the responsibility for cleanup of hazardous waste disposal sites on those who generated the wastes, and those who owned or operated the sites. This enforcement approach not only conserves Fund resources, it also frees EPA personnel to work on other sites. To maximize the benefit of PRPs conducting the RD/RA, yet ensure compliance with the Settlement Agreement and protection of health and the environment, this guidance outlines a focused approach to oversight. EPA approval authorities and monitoring focus on certain key documents and activities performed during the design and construction of the remedy.

A second aspect of the focused approach is to formalize the requirement for PRPs to implement a construction quality assurance program. This is consistent with standard industry construction practice. In addition to reducing the duplication of quality assurance activities, this will maintain the burden of quality assurance accountability with the PRP.

CHAPTER 2

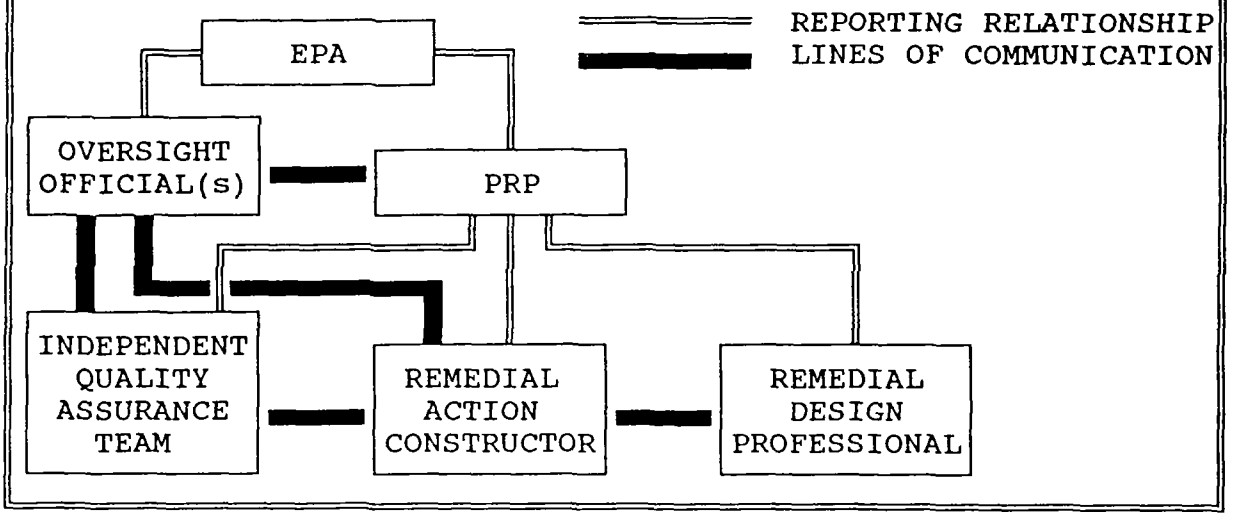
ROLES AND RESPONSIBILITIES

This chapter presents a summary of the general roles and responsibilities of the Potentially Responsible Party(s) and the EPA when implementing the RD/RA on an enforcement lead site. Because each Superfund site and RD/RA is unique, there are other acceptable variations of the PRP organizational structure in addition to those presented in this section. Regardless of the PRP organizational structure, however, it is the ultimate responsibility of the PRP to successfully implement the remedy under the terms of the Settlement Agreement.

Figure 2-1 presents a simple organizational chart illustrating the relationships in an enforcement lead project in which the PRP conducts the RD/RA. There are a number of organizations that could be used for conducting the work, and the best approach will depend on the experience and preference of the PRPs.

FIGURE 2-1

RELATIONSHIPS AMONG PARTIES WHEN RD/RA IS PERFORMED BY A PRP



A "reporting relationship" is defined as a direct line responsibility in which one party, as an agent of the other or as a legal requirement, is compelled to report the results of their work or observations. The PRP has a "reporting relationship" with the EPA as a condition of the Settlement Agreement, while agents and contractors hired by the PRP have a similar type of association with the PRP. Where "lines of communication" are indicated in

Figure 2-1, it implies that an information exchange is highly desirable between parties. Such an exchange is usually necessary for a successful implementation of a remedy, however, there is no legal requirement for such communication.

The PRPs are legally responsible for the adequacy of the design and the implementation of remedies specified in the Settlement Agreement. After ensuring the public health and environment are protected, EPA's primary goal is to confirm the PRPs meet all performance standards specified in the Settlement Agreement. This guidance introduces the concept of using an "Independent Quality Assurance Team" to ensure compliance and provide unbiased quality assurance monitoring of the Remedial Action. The following sections discuss the specific roles and responsibilities of the PRP and EPA in the implementation of an enforcement lead project where the PRP does the RD/RA.

2.1 POTENTIALLY RESPONSIBLE PARTIES

The PRPs are legally responsible for complete site remediation as specified in the Settlement Agreement. All work is done under the PRP's control and they are responsible for the long term performance of the remedy. EPA monitors compliance. The PRPs provide the necessary input to effect site remediation, whether done with "in-house" resources, or through the use of hired contractors and subcontractors. PRP responsibilities are apportioned among the Remedial Design Professional, the Remedial Action Constructor, and the Independent Quality Assurance Team.

In an enforcement lead RD/RA, the following roles and responsibilities fall under the direction of the PRP. The purpose of the descriptions is to provide a typical view of the design and construction process. Much of this discussion is based upon the American Society of Civil Engineers' publication entitled Quality in the Constructed Project: A Guideline for Owners, Designers and Constructors, Volume 1, Preliminary Edition for Trial Use and Comment, May 1988. Please refer to this publication for further information.

2.1.1 Remedial Design Professional

The primary function of the Remedial Design Professional, or design engineer, is to provide the PRP with a set of plans and specifications for the proposed remediation which meets the requirements and is within budget and on schedule. The Remedial Design Professional may be an employee of the PRP or may be a private consulting entity retained under a contractual relationship with the PRP. Unless the Remedial Design Professional has a large

and experienced staff, many projects are sufficiently complex to require the design team to be supplemented with additional capabilities, i.e., geotechnical, electrical, mechanical or structural engineers, field surveyors, or other specialized skills. This may be done by subcontracting with the Remedial Design Professional or some of these specialists may contract directly with the PRP. Tasks which the Remedial Design Professional may be responsible to perform include the following:

- Evaluate and interpret data generated in the planning phase, such as treatability data and geotechnical investigations;
- Collect and evaluate additional data required for the design phase;
- Provide a complete engineered design of the Remedial Action to be constructed, i.e., plans and specifications;
- Identify and obtain easements, permits, and approvals necessary for the RD/RA;
- Identify critical technical requirements and activities where quality may be at risk;
- Provide and review key documents concerning compliance with design requirements; and
- Update plan and specification changes during construction.

In addition to the above responsibilities, the Remedial Design Professional will usually be required to provide a Resident Engineer to act as the PRP's agent on the site during construction. In some situations the Resident Engineer may be hired directly by the PRP. In either case, this person is one of the most critical in establishing and maintaining construction quality on the site. Typically the Resident Engineer is required to:

- Review progress and shop-drawing submittal schedules;
- Serve as the PRP and Remedial Design Professional's liaison with the Remedial Action Constructor;
- Maintain, at the site, orderly files of all job records;
- Log shop drawings and samples;

- Review work performed, disapprove defective work, and verify that test and start-up procedures are accomplished;

- Accompany PRP personnel and inspectors, and other agency personnel with a jurisdictional interest, during site visits;

- Prepare periodic progress reports, make recommendations concerning major inspections and tests, draft change orders, field orders, and work directive changes;

- Conduct the pre-final and final inspection of completed work with PRP, Remedial Action Constructor, EPA, and other agencies with a jurisdictional interest;

- Prepare a Project Closeout Report which certifies the completed project has been constructed in accordance with the Settlement Agreement and that all performance standards have been met; and

- Determine that certificates, operation and maintenance (O&M) manuals, and other required data have been assembled by the Remedial Action Constructor.

2.1.2 Remedial Action Constructor

A Remedial Action Constructor's primary responsibility in constructing the Remedial Action is to meet the quality standards specified by the design and accepted trade practices. They are responsible to the PRP for implementing and maintaining the quality control (QC) program. The following is a list of responsibilities that generally apply to Remedial Action Constructors on most jobs:

- Obtain all necessary permits and approvals as required by the Remedial Action activities;

- Construct the project according to the plans and specifications by supervising and controlling the execution of work, including means, methods and sequences of construction;

- Provide progress schedules and other required submittals;

- Furnish signs, utilities, and office facilities, as required;
- Maintain "Record Drawings" at the site, properly noting all changes made during construction;
- Be responsible to the public and to site personnel for project safety;
- Notify all personnel in the event that the Contingency Plan has been triggered;
- Implement and maintain a construction quality control program, identify and report problems, provide qualified testing to demonstrate that proposed materials and equipment are acceptable, and respond constructively to quality control issues; and
- Cooperate fully with inspection authorities and provide them access to the project for adequate inspection.

2.1.3 Independent Quality Assurance Team

Quality is conformance to properly developed requirements. In the case of construction contracts, these requirements are established by the contract specifications and drawings. Quality assurance is planned and systematic actions by the PRP to provide confidence that the completed remedy meets these requirements. The Independent Quality Assurance Team is used to provide this level of confidence to the PRP by testing and inspecting the work of the Remedial Action Constructor. Quality control is the system used by the Remedial Action Constructor to manage, control, and document the compliance with requirements of all Remedial Action activities. This includes not only activities of the parent firm, but also those of suppliers and subcontractors.

The Independent Quality Assurance Team are representatives from testing and inspection organizations, independent of the constructor, that are responsible for examining and testing various materials, procedures, and equipment during the construction. Since the PRP is responsible for the quality assurance of the remedy, the Independent Quality Assurance Team is retained by the PRP. The qualifications and expertise of the personnel should be commensurate with the scope of the project. Typical functions of the Independent Quality Assurance Team are to:

- Review design criteria, plans, and specifications for clarity and completeness;
- Direct and perform observations and tests for quality assurance inspection activities;
- Verify that the Construction Quality Control Plan is implemented in accordance with the site-specific Construction Quality Assurance Plan;
- Perform independent on-site inspections of the work to assess compliance with design criteria, plans and specifications;
- Verify that equipment used in testing meets the test requirements and that the tests are conducted according to standardized procedures; and
- Report to the PRP and EPA the results of all inspections and corrective actions, including work that is not of acceptable quality or that fails to meet the specified design requirements.

2.2 ENVIRONMENTAL PROTECTION AGENCY

EPA is responsible for protecting the public health and the environment and ensuring that the PRPs comply with the terms of the Settlement Agreement. The most successful way for EPA to do this is to vest responsibility for the project in a single individual within EPA. This person is known as the Remedial Project Manager (RPM) or as the EPA Project Coordinator. For the purposes of this guidance these terms will be synonymous.

2.2.1 Remedial Project Manager

The Remedial Project Manager is defined as the Federal official designated by EPA to coordinate, monitor, or direct remedial activities. In the case of an enforcement lead project, the RPM's role is one of coordination and monitoring. At a minimum, the RPM should review and approve the following documents submitted by the PRP under the Settlement Agreement:

- Remedial Design and Remedial Action Work Plans;
- Preliminary and final design;
- Construction Quality Assurance and Construction Quality Control Plans;

- Contingency Plan; and
- Project Closeout Report.

Traditionally, the RPM may exercise a high level of oversight at the onset of the project. As the PRP demonstrates competence in implementing the remedy, the amount of oversight may be relaxed accordingly. The oversight program must focus the RPM's efforts on the most significant aspects of the project, such as overall quality, scheduling, major changes due to changed field conditions, site safety, emergency actions, and project close-out.

The RPM acquires technical assistance for performing oversight by engaging one or more Oversight Officials capable of providing support in all technical aspects of the Remedial Design and Remedial Action. The recommended options available for oversight support include Alternative Remedial Contract Strategy (ARCS), the US Army Corps of Engineers (USACE), and the Bureau of Reclamation.

2.2.2 Oversight Official

The Oversight Official is under some form of contractual or interagency agreement with EPA and reports directly to the RPM. They provide technical support to the RPM in monitoring PRP compliance with the Settlement Agreement. The responsibilities of an Oversight Official during Remedial Design could include the following:

- Assist in reviewing the professional qualifications of Remedial Design Professional, Remedial Action Constructor, and the Independent Quality Assurance Team;
- Review the Remedial Design and Remedial Action Work Plans;
- Review design support data including field investigations and treatability study results;
- Review the Remedial Design submittals to determine if they are protective of the public health and the environment, comply with the Record of Decision (ROD), and will attain the performance criteria specified in the Settlement Agreement.

During Remedial Action, the Oversight Official reviews for compliance with the Construction Quality Assurance Plans, schedule, and the approved plans and specifications. Construction oversight is limited to observing construction and comparing the work to a

set of standards (in this case, the design plans and specifications, and the Construction Quality Control Plan prepared by the PRP's Remedial Action Constructor). The Oversight Official also spot checks the activities of the Independent Quality Assurance Team and reviews quality assurance reports. The results of all Remedial Action oversight activities are reported to the RPM.

CHAPTER 3

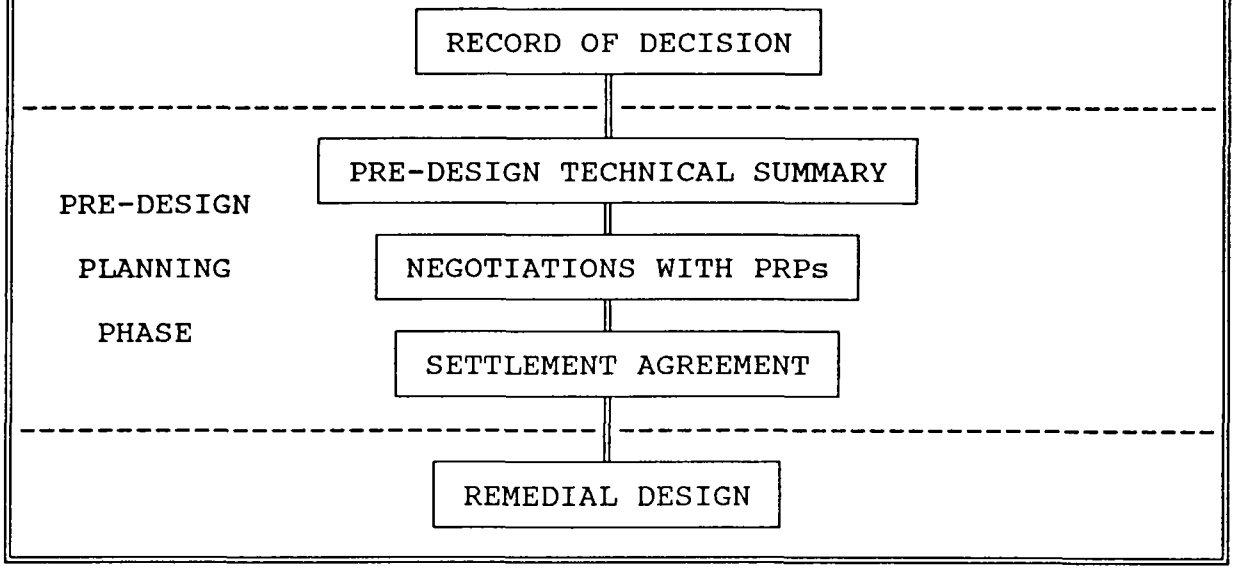
MODEL SETTLEMENT AGREEMENT FOR REMEDIAL DESIGN/ACTION

3.1 INTRODUCTION

The pre-design planning phase as shown in Figure 3-1 moves the project from the ROD into Remedial Design. After the ROD is signed, EPA prepares a "Pre-Design Technical Summary" which defines the technical criteria to implement the remedy. Negotiations then take place with the PRP. If it is determined that the RD/RA will be conducted as an enforcement response action, the PRP enters into an agreement with EPA. This agreement specifies the terms and conditions of the work to be performed by the PRP and is embodied in either an administrative order on consent or a judicial consent decree.

FIGURE 3-1

PRE-DESIGN PLANNING PHASE



The term "Settlement Agreement" is used in this guidance to refer to either an administrative order on consent or a judicial consent decree. It is a commitment by the PRPs that they will finance and perform the Remedial Design and Remedial Action in accordance with the provisions set forth in the Settlement Agreement.

3.2 SETTLEMENT AGREEMENT PROVISIONS

EPA is developing a "Model Consent Decree for RD/RA" and a "Model Unilateral Order for RD/RA" to be used as a guide in preparing Settlement Agreements. These models incorporate the essential provisions to implement this guidance and should be referred to for more information. The following is a brief summary and description of provisions included in these models.

3.2.1 Introductory Sections

The introductory sections of the Settlement Agreement generally include discussions of the following items:

- Description of what EPA and the State seek in their complaint against the PRP, and the status of the site activities that have previously taken place;
- Jurisdiction of EPA and/or the courts relative to the PRP;
- Parties bound by the Settlement Agreement (PRP, including employees, agents, and assigns); and
- Definitions of terms used in the Settlement Agreement and attachments incorporated thereunder.

3.2.2 General Provisions

Included in these sections are discussions which address the following issues:

- The objectives of the parties entering into the agreement, i.e., protection of the public health and welfare and the environment from releases of waste material from the site;
- The responsibility of the PRP to finance and perform the work in accordance with the Settlement Agreement, including past response costs, oversight response costs, and future response costs;
- The requirements for both EPA and the PRP to designate a Project Coordinator to serve as the contact point for each party;

- Requirements for compliance with applicable laws and for the performed work to achieve the performance standards specified;

- The requisite for the PRP to obtain all permits required by CERCLA and the National Contingency Plan;

- The notice of obligations to Successors-in-Title;

- The right of EPA to access the site at all times for the purpose of conducting any activity related to the Settlement Agreement, such as monitoring work, verifying data, conducting investigations, obtaining samples, and assessing PRP compliance;

- Requirements for all aspects of the work performed by the PRP to be under the direction and supervision of qualified contractors, the selection of whom are subject to EPA approval;

- Procedures for EPA to review PRP submissions including the process for approval, conditional approval, or disapproval of these submissions; and

- Acknowledgement that EPA review and approval of PRP submissions does not warrant the performance standards will be met.

3.2.3 Remedial Design

These sections describe the requirements of the PRP to commence and perform the Remedial Design as a contractual obligation. Items which are required to be submitted to EPA for review only or review and approval should be described. This could include such items as:

- Remedial Design Work Plan which provides for the design of the remedy set forth in the ROD and in accordance with the Statement of Work. The Remedial Design Work Plan would include plans and schedules for the implementation of all Remedial Design and pre-design tasks identified in the Statement of Work;

- Health and Safety Plan for all field design activities;

- Preliminary design submittal to include design criteria, project delivery strategy, results of treatability studies and additional field sampling, preliminary plans and drawings, outline of required specifications, and a preliminary construction schedule;

- Intermediate design submittal (optional); and

- Pre-final/final design submittal which includes the final plans and specifications, Operation and Maintenance Plan, Field Sampling Plan, Construction Quality Assurance Plan, and the Contingency Plan.

3.2.4 Remedial Action

The requirements for the PRP to initiate Remedial Action after approval of the Remedial Design are described in these sections. This could include the following items:

- Submission to EPA for review and approval a Remedial Action Work Plan which details the plan and schedules for the construction of the remedy;

- The requisite to submit for EPA review a Health and Safety Plan for all field construction activities;

- Requirements for the off-site shipment of any waste material to an out-of-state waste management facility; and

- The requirement for the PRP to implement the activities required by the approved Remedial Action Work Plan.

3.2.5 Quality Assurance

Included in these sections are descriptions of the requirements for the PRP to use quality assurance and quality control procedures for all remedial activities that take place on the site. It would include the following requirements:

- That the PRP submit a Construction Quality Assurance and Quality Control Plan;

- The requirement for the PRP to retain an Independent Quality Assurance Team, separate from the Remedial Action Constructor, to conduct quality assurance activities during the construction phase of the project; and

- The right for EPA to take split or duplicate samples of any samples collected by the PRP, and the right to take any additional samples deemed to be necessary.

3.2.6 Reporting Requirements

Described in these sections is the frequency and type of reports required for the PRP to submit to the EPA. Typical reporting requirements for the reporting period specified could include the following:

- Actions taken toward achieving compliance with the Settlement Agreement;

- All sampling and test results and all other data generated by the PRPs or their contractors;

- All plans and deliverables completed during the reporting period;

- All actions scheduled for the next reporting period including data collection and implementation of work plans and other information relating to the progress of construction; and

- Information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the work plan, and a description of efforts made to mitigate those delays.

3.2.7 Endangerment and Emergency Response

This section defines the requirements of the PRP in the event of any action or occurrence which causes or threatens a release of waste material, or which may present an immediate threat to the public health or welfare or the environment.

3.2.8 Certification of Completion

After the PRPs conclude that the Remedial Action has been fully performed, the PRPs shall so notify EPA and shall schedule a pre-certification inspection to be attended by the PRP and EPA. The requisites for this procedure is described in the Settlement Agreement. It details the notification and inspection requirements, the method for correction of deficiencies, and the issuance of a certification of completion.

3.2.9 Other Conditions and Requirements

Many sections are required in the Settlement Agreement to address the performance of the PRP and other miscellaneous requirements. They could include the following:

- The requirements (notification, review, and approval process) if EPA or the PRP determines that additional response activities are necessary to meet the performance standards;

- The requirements of the PRP to demonstrate their ability to complete the work and to pay all claims which may arise. Such requirements may include performance bonds, letters of credit, third party work guarantees, and EPA access to PRP financial records;

- The requirements of the PRP to notify EPA of any event which may delay the performance of the work. If EPA agrees that the delay is attributable to a force majeure (i.e., event arising from causes entirely beyond the control of the PRP), the times for performance that is directly affected by the force majeure may be extended;

- The requirements for the establishment of a Trust Fund necessary to finance the obligations of the PRP under the terms of the Settlement Agreement. This section would also describe

the method for the PRP to reimburse the EPA for past response costs, oversight response costs, and future response costs;

- PRP insurance requirements;
- Dispute resolution procedures, i.e., mechanisms to resolve disputes arising under or with respect to the Settlement Agreement;
- The stipulated penalties for violations to the conditions of the Settlement Agreement. Language is also included which details when the EPA or PRP has the right to sue or take administrative actions against the other party for any claims related to or arising from any response action taken with respect to the site or Settlement Agreement;
- The right for EPA to be provided access to copies of all documents and information relating to site activities and implementation of the Settlement Agreement. It also describes the time requirements of the PRP to preserve and retain all records that relate in any way to the site;
- Requirements for making modifications to the Settlement Agreement; and
- Requirements for community relations and opportunities for public comment.

3.2.10 Concluding Sections

The concluding sections of the Settlement Agreement include the following sections:

- Addresses of EPA and PRP for notices and submissions;
- Effective and termination dates of the Settlement Agreement; and
- Signatories.

CHAPTER 4

REMEDIAL DESIGN OVERSIGHT

The Remedial Design establishes the general size, scope, and character of a project. It details and addresses the technical requirements of the Remedial Action. Remedial Design begins with preliminary design and ends with the completion of a detailed set of engineering plans and specifications.

There are two approaches to Remedial Design: performance-based and definitive. In a performance-based design, basic technical specifications are developed, containing the performance requirements for the work. The Remedial Design Professional focuses on defining criteria and process limits. It is the Remedial Action Constructor's responsibility to implement a remedial plan that achieves those technical specifications.

In a definitive design, information is provided on system integration and on appropriate equipment for each unit process. The designer chooses equipment, dimensions, controls, size, shape, materials, and installation details. The constructor builds to these definitive plans and specifications.

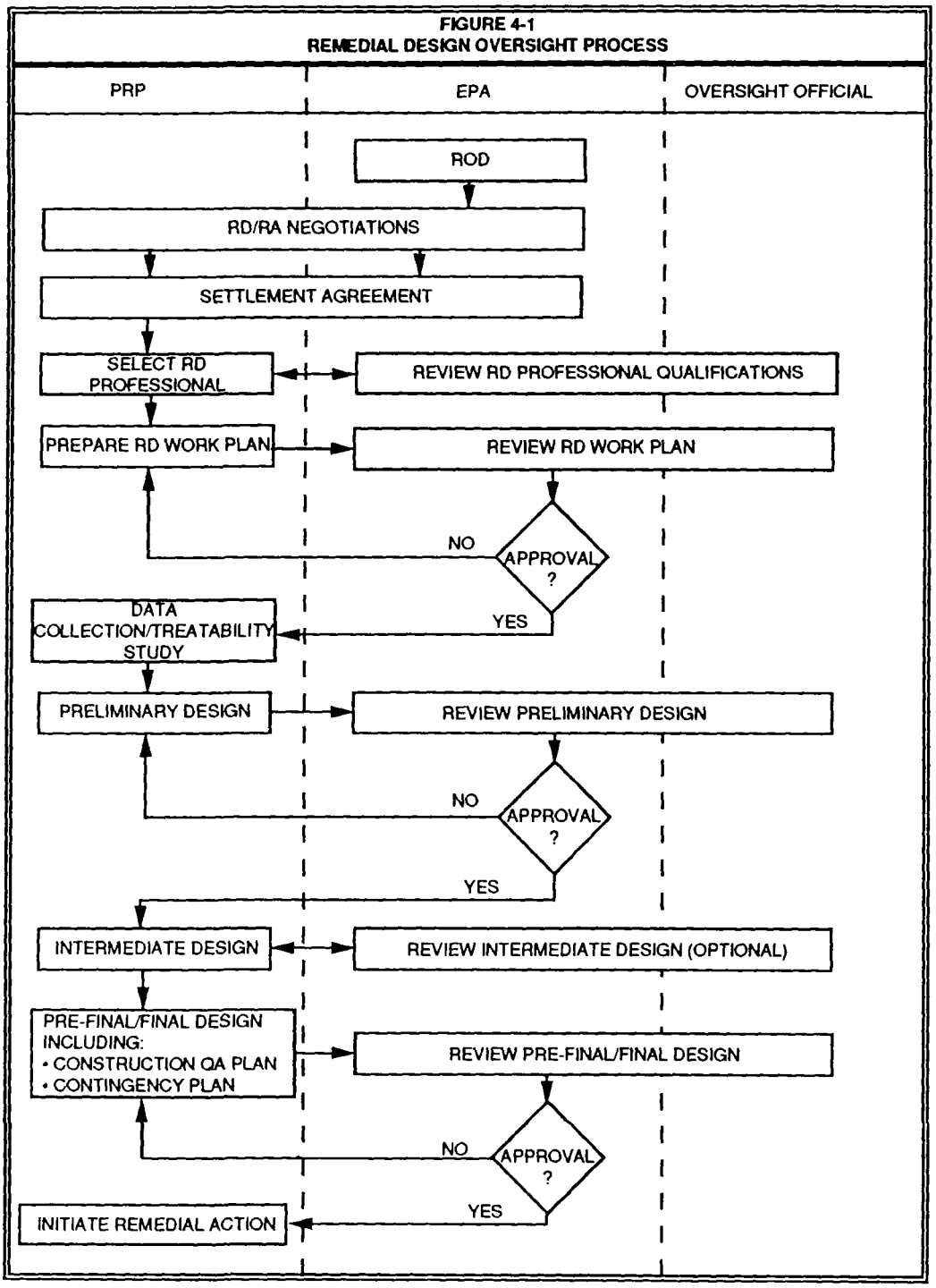
In many situations, a mixed design approach is used. This often occurs for designs incorporating an innovative or emerging technology for which there is relatively little information available. In this instance, the designer may use a performance specification for the innovative technology and a definitive design for all other aspects.

Figure 4-1 presents a flow chart illustrating the Remedial Design process of the focused approach to oversight. The "diamonds" in the figure represent decision or review points that are the RPM's responsibility and are considered critical to the quality and success of the project.

4.1 STANDARD REMEDIAL DESIGN TASKS

Before commencing Remedial Design, it is often necessary to perform design related tasks (e.g., data gathering and treatability studies). In addition, there are other activities required to be performed during the actual design process to support the design (e.g., establishing design criteria and a delivery strategy, value engineering study, and community relations). The following standard tasks are commonly required in a PRP performed Remedial Design, either as prerequisites to the design or as part of the actual design.

FIGURE 4-1
REMEDIAL DESIGN OVERSIGHT PROCESS



4.1.1 Design Investigation

It is unlikely that all the data required for the Remedial Design was collected during the remedial investigation and feasibility study (RI/FS) phase. Some RODs prescribe remedies contingent on the results of additional testing or treatability studies. Additional field data may need to be collected and evaluated, including geotechnical investigations, groundwater sampling, and surveys (property, utility, right-of-way, topographic). Usually this information is required before the significant progress can be made on the design.

4.1.2 Design Support

During the initial preliminary design phase, concepts supporting the technical aspects of the design are defined in detail. Much of the information is based on the results of field data and treatability studies that may have been completed since the RI/FS. These design criteria supplement the information provided in the "Pre-Design Technical Summary" and are commonly summarized in a report format that usually addresses the following items:

- Summary of available data;
- Design assumptions and parameters including "Applicable or Relevant and Appropriate Requirements" (ARARs), design restrictions, and so forth;
- Process design and performance criteria;
- Long-term monitoring and operation requirements;
- Real estate, easement, and permit requirements; and
- Cleanup verification methods.

Besides the design criteria, which primarily address the project's technical issues, the designer must devise a strategy for delivering the project. This is the management approach to carry out the design and implement the Remedial Action. It normally discusses the following items:

- Procurement method and contracting strategy;
- Phasing alternatives
- Health and safety considerations;

- Review requirements;
- Design schedule;
- Contractor, labor, and equipment availability concerns; and
- Requirements for addressing sampling and data gathering methods (Field Sampling Plan), quality assurance considerations (Construction Quality Assurance Plan), and air emissions and spill control requirements (Contingency Plan).

4.1.3 Plans and Specifications

The goal of Remedial Design is to produce a detailed set of engineering plans and specifications that are consistent with the technical criteria established for the design. These documents present the design information in the detail appropriate for the requirements of the project.

4.1.4 Construction Cost Estimate

An important element of Remedial Design is to prepare a cost estimate for the construction activities covered by the design. The PRP will need this information in order to plan for Remedial Action. Unless required by the Settlement Agreement, the PRP is not required to share the cost estimate with EPA, although this information might be beneficial in cost negotiations, i.e., de minimis settlements.

4.1.5 Construction Schedule

A construction schedule is developed to identify major tasks, determine their duration, and establish milestone dates. Key issues that may affect the schedule should also be identified.

4.2 REMEDIAL DESIGN REVIEW

During Remedial Design, EPA monitors and reviews the performance of the PRP. The Oversight Official provides technical assistance to EPA in this process. An approval of any of the Remedial Design work elements at any stage by EPA in no way guarantees the success or failure of the ultimate remedy. This is analogous to a city issuing a building permit to a developer for construction of a building. The permit does not guarantee the

building will be structurally sound, it merely indicates compliance with the minimum design criteria and standards of the city for such buildings. The soundness of the building's construction is still the complete responsibility of the owner. Similarly, EPA review and approval of a PRP's work plan or design merely assesses their acceptability with regard to Remedial Action goals in accordance with the ROD and the Settlement Agreement. It does not warrant that the specified performance standards will be met.

4.2.1 Review of Remedial Design Professional Qualifications

The PRP is responsible for selecting the Remedial Design Professional, subject to the approval of EPA. Selecting a qualified designer with the training, experience, staff, and capabilities consistent with the scope of work is an important step towards completing a quality constructed project. Factors that should be considered in evaluating a Remedial Design Professional's qualifications include the following:

- The professional and ethical reputation as determined by inquiries with previous clients and other references;
- The principal and other responsible members of the firm must be registered professional engineers;
- The Remedial Design Professional should have demonstrated qualifications and expertise in performing the specific design services required for the project, including knowledge of codes or other governmental regulations; and
- The Remedial Design Professional should be able to assign or make provision for qualified staff to work on the project and be able to complete required services within the time allotted.

The RPM, in conjunction with the Oversight Official, should review the qualifications of the Remedial Design Professional. The resultant analysis is used to form the basis of the level of oversight employed by EPA during the Remedial Design process.

4.2.2 Review of Remedial Design Work Plan

The Remedial Design Work Plan is the first major deliverable and area of focus for the RPM and Oversight Official. It is the PRP's interpretation of the Settlement Agreement and the Statement of Work. A thorough review of the work plan is essential since it

sets the course for the PRP's implementation of the design portion of the Remedial Action. The Remedial Design Work Plan should be reviewed for its thoroughness and approach, and to ensure that it contains at least the following items:

- Tentative formation of the design team;
- A Health and Safety Plan for design activities;
- Requirements for additional field data collection;
- Requirements for treatability studies;
- A schedule for completion of the design;
- Design criteria and assumptions; and
- Tentative treatment schemes.

The RPM and Oversight Official should use the results of this review and the evaluation of the Remedial Design Professional qualifications to establish the level of initial Remedial Design oversight as the designer begins the preliminary design.

4.2.3 Preliminary Design Review

The preliminary design review is the most critical technical review performed during Remedial Design oversight. Since the preliminary design sets the pattern and direction of the entire design process, it is imperative that any deficiencies in the Remedial Action performance standards be identified. Furthermore, inconsistencies within the design itself must be identified and corrected before the PRPs proceed with the detailed design submissions. Based on the Settlement Agreement, EPA is required to review and approve this submission. The preliminary design submittal from the PRP should include the following elements:

- Design criteria;
- Project delivery strategy;
- Results of treatability studies and additional field sampling;
- Preliminary plans, drawings, and sketches;
- Outline of required specifications; and
- Preliminary construction schedule.

In performing the preliminary design review, the Oversight Official and the RPM use their professional training to assess the feasibility of the design to achieve the Remedial Action goals in accordance with the ROD and Settlement Agreement. The Oversight Official makes a recommendation to the RPM based on the criteria listed below. The RPM is responsible for the deciding whether the design is adequate and if enforcement action is necessary.

Ultimately the Settlement Agreement and any document incorporated into the agreement set the performance criteria for the site. The preliminary design review should evaluate the adequacy of the design with respect to all environmental and public health requirements. A review with respect to environmental criteria can be done by determining the feasibility of the design to meet the performance standards. The preliminary design should be reviewed with consideration of the following:

- Technical requirements of the ROD, Settlement Agreement, and ARARs;
- Currently accepted environmental protection measures and technologies;
- Standard professional engineering practices;
- Applicable statutes, EPA policies, directives, and regulations;
- Conformance with results of field data and treatability studies;
- Reasonableness of estimated quantities of materials specified based on known data; and
- Examination of the construction schedule for meeting project completion goals.

The preliminary design review is limited to ensuring that the design criteria and the delivery strategy are consistent with the design requirements of the selected remedy. It should focus only on the environmental aspects of the design. The level of review should initially be limited to the following:

- Verifying that appropriate unit processes are being employed by the treatment train;
- Confirming that the removal or treatment efficiencies assumed are reasonable for both the process and waste (concentration and volume);

- Checking that process waste streams are adequately identified and addressed, and that flow rates are appropriate;

- Verifying that the proposed siting of the process is appropriate and that any site abnormalities have been addressed; and

- Spot checking some (about 10%) of the design calculations.

The review can be expanded if any of the above areas appear to be deficient. Approval of the preliminary design only allows the PRP to proceed to the next step of the design process. It does not imply acceptance of later design submittals that have not been reviewed, or that the remedy, when constructed, will meet performance standards and be accepted.

4.2.4 Intermediate Design Review

The intermediate design review is an optional review and would normally only be performed for larger, complex designs or when required by the Settlement Agreement. The design is reviewed to determine that comments from the preliminary design review have been incorporated. If a value engineering study has been performed by the PRP, the intermediate design would typically reflect any design modifications resulting from this study. These changes must be evaluated for consistency with the ROD.

4.2.5 Pre-Final/Final Design Review

The pre-final/final design submittals are reviewed for consistency with the ROD and Settlement Agreement. The final design submittal package from the PRP should include the following:

- Final design plans and specifications;

- Operation and Maintenance (O&M) Plan;

- Field Sampling Plan (FSP). This defines in detail the sampling and data gathering methods to be used during construction of a project. It is the basis for ascertaining whether the performance standards have been achieved by the Remedial Action. A description of a FSP can be found in Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (U.S. EPA, Interim Final, October 1988, OSWER Directive No. 9355.3-01);

- Construction Quality Assurance Plan. This plan describes the site specific components of the quality assurance program. The purpose is to ensure, with a reasonable degree of certainty, that the completed project meets or exceeds all design criteria, plans, and specifications. More information and the specific elements to be included in a Construction Quality Assurance Plan can be found in Appendix A; and

- Contingency Plan. This is written for the local affected population in the event of an accident or emergency at the site. More information describing a Contingency Plan and the specific elements to be included in a this plan can be found in Appendix B.

The pre-final/final design review is the last review of the Remedial Design and should be based upon the approved preliminary and intermediate design submittals. The Oversight Official and RPM assess the acceptability of the final design submittals on the basis of the same considerations used for the preliminary design. The approval of the final design is acceptance that the project may proceed to the next step; i.e., community relations activities and preparation of a Remedial Action Work Plan.

4.3 COMMUNITY RELATIONS

At the conclusion of the Remedial Design, the RPM distributes to the community and other interested persons, a fact sheet on the final engineering design. The fact sheet enables EPA to inform the public about activities related to the final design, including the schedule for implementing the Remedial Action, what the site will look like during construction, the roles of the PRP and EPA, the Contingency Plan, and any potential inconveniences such as excess traffic and noise. The RPM should also provide an opportunity for a public briefing to be held near the site prior to initiation of the Remedial Action. A public briefing could address issues such as construction schedules, changes in traffic patterns, location of monitoring equipment, and the methods in which the public will be informed of progress at the site.

CHAPTER 5

REMEDIAL ACTION OVERSIGHT

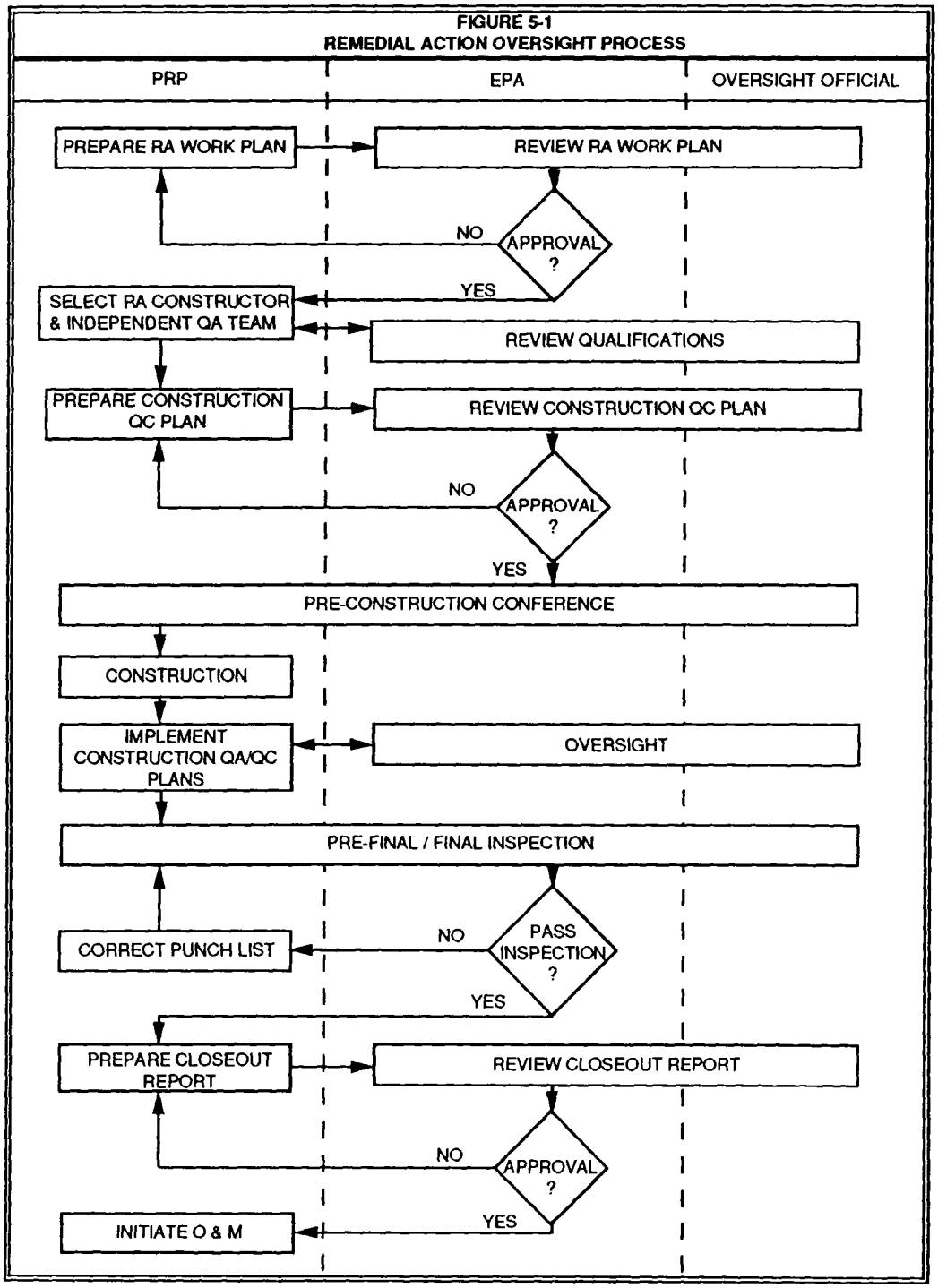
After completion of the Remedial Design, the Remedial Action begins, during which the actual implementation of the remedy occurs. Figure 5-1 presents a flow chart that illustrates the Remedial Action process of the focused approach to oversight. As in Figure 4-1, the "diamonds" represent critical decision or review points required of the RPM.

The RPM may use a high level of oversight at the onset of the Remedial Action as determined by requirements specified in the Settlement Agreement, the complexity of the remedy, past performance of the PRPs, the qualifications of the PRPs' design and construction teams (including the Independent Quality Assurance Team) and any other relevant factors affecting the design and implementation of the Remedial Action. The level of this oversight may then be adjusted accordingly as implementation proceeds based upon the actual performance of the Remedial Action Constructor. The objective of the oversight program is to focus the RPM efforts on the most significant aspects of the project such as environmental protection, consideration of public health concerns, overall quality, scheduling, major changes due to changed field conditions, emergency actions, and project close-out.

5.1 REMEDIAL ACTION REVIEWS

During Remedial Action, EPA monitors and reviews the performance of the Remedial Action Constructor in building the project. It is the PRP's responsibility to ensure the Remedial Action Constructor meets the quality standards specified by the design and accepted trade practices. EPA, through the Oversight Official, monitors and reviews the work of the PRPs on the basis of defined applicable standards, in this case, approved design plans and specifications and the Construction Quality Assurance and Quality Control Plans. It is inappropriate for the Oversight Official to direct or determine the means and methods of construction. Clearly defining these roles, and adhering to them, ensures that the responsibility and accountability of the construction project remains with the PRP.

FIGURE 5-1
REMEDIAL ACTION OVERSIGHT PROCESS



5.1.1 Review of Remedial Action Work Plan

The Remedial Action Work Plan is the basis for the PRP's approach to the implementation of the designed Remedial Action. The work plan may be a negotiated part of the Settlement Agreement or it may be a required submission under the agreement. As with the Remedial Design Work Plan, the RPM and Oversight Official should thoroughly review the work plan to ensure that the PRP will use a sound approach to the Remedial Action.

The Remedial Action Work Plan should be reviewed to ensure that it addresses the following:

- Tentative formulation of the Remedial Action Team, including the key personnel, descriptions of duties, and lines of authority in the management of the construction activities;
- Description of the roles and relationships of the PRP, PRP Project Coordinator, Resident Engineer, Independent Quality Assurance Team, Remedial Design Professional, and Remedial Action Constructor;
- Process for selection of the Remedial Action Constructor;
- Schedule for the Remedial Action and the process to continuously update the project schedule;
- Method to implement the Construction Quality Assurance Plan, including criteria and composition of the Independent Quality Assurance Team;
- A Health and Safety Plan for field construction activities;
- Strategy for implementing the Contingency Plan;
- Procedure for data collection during the Remedial Action to validate the completion of the project; and
- Requirements for project closeout.

5.1.2 Review of Remedial Action Constructor Qualifications

The PRP is responsible for selecting the Remedial Action Constructor, whether through a competitive bidding process or the assignment of PRP "in-house" resources. EPA reviews and approves the selection of the Remedial Action Constructor using the following criteria for guidance:

- An evaluation of the professional and ethical reputation as determined by inquiries with previous clients and other references;
- The Remedial Action Constructor should have previous experience in the type of construction activities to be implemented;
- A demonstrated capability to perform the specific construction activities required; and

Again, as with the Remedial Design Work Plan, the RPM and the Oversight Official will use this evaluation to assist in determining the initial level of oversight required for construction activities.

5.1.3 Independent Quality Assurance Team Qualifications

Quality assurance is planned and systematic actions by the PRP to provide confidence that the constructed remedy meets project requirements. The Independent Quality Assurance Team is used to provide this level of confidence to the PRP by selectively testing and inspecting the work of the Remedial Action Constructor, and ensuring the Construction Quality Control Plan is being effectively implemented. The members of the Independent Quality Assurance Team are representatives from independent testing and inspection organizations responsible for examining and testing various materials, procedures, and equipment during the construction. Since the PRP, as the owner, is responsible for the quality of the remedy, the Independent Quality Assurance Team is retained by the PRP. They may be separate consultants working for the PRP under a contractual relationship or they might be "in-house" personnel assigned to the project. EPA reviews and approves the selection of the Independent Quality Assurance Team using the following criteria for guidance:

- An evaluation of the professional and ethical reputation as determined by inquiries with previous clients and other references;

- The qualifications and expertise of the inspection personnel should be commensurate with the scope of the project;

- Confirmation that the Quality Assurance team is truly independent and autonomous from the Remedial Action Constructor; and

If a PRP elects to use "in-house" resources to implement the Remedial Action, it is inappropriate for PRP "in-house" personnel to also be used for quality assurance. It is necessary for the Quality Assurance Team be completely independent of the constructor so the results of the quality assurance are unbiased and objective. In this situation, it is preferable that EPA utilize the Oversight Official to provide Independent Quality Assurance services.

5.1.4 Construction Quality Assurance and Control Plans

The focused approach to Remedial Action oversight is directed at the implementation of the Construction Quality Assurance and the Construction Quality Control Plans. It involves both quality assurance, a planned system of activities by the Independent Quality Assurance Team to provide confidence that the facility is constructed as specified in the design; and quality control, a planned system of inspections and tests performed by the Remedial Action Constructor to directly monitor and control the quality of the construction project.

The Construction Quality Assurance Plan is normally prepared by the Remedial Design Professional and is submitted with the final design. It is the responsibility of the Resident Engineer to implement it through the Independent Quality Assurance Team. The use of the Independent Quality Assurance Team will provide for an unbiased implementation of the Construction Quality Assurance Plan. More information and the specific elements to be included in this plan can be found in Appendix A.

Construction quality control should be a requirement on all construction projects. The Remedial Action Constructor is responsible for all activities necessary to manage, control, and document work so as to ensure compliance with the project requirements, i.e., plans and specifications. The Construction Quality Control Plan is prepared by the Remedial Action Constructor and it should be indicative of the scope and complexity of the work as well as the project requirements. It is the Remedial Action Constructor's management tool and should include:

- A description of the organization providing quality control, including lines of authority;

- The name, qualifications, duties, responsibilities, and authorities of each person assigned a quality control function;

- A copy of a signed letter which describes the responsibilities and delegates the authorities of the quality control manager;

- Methods of performing the quality control inspections, including when inspections should be made and what to look for;

- Control testing procedures for each specific test. This includes information which authenticates that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used complies with applicable standards;

- Procedures for scheduling and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents; and

- Reporting procedures including frequency of reports and report formats.

The Oversight Official should assist the RPM in reviewing each of the above plans. The review should focus on determining that the Construction Quality Control Plan is consistent with the requirements of the plans and specifications, and that the Construction Quality Assurance Plan ensures the performance standards will be met. The review should examine the appropriateness and the frequency of the tests and inspections identified in both plans. Reviewing the Construction Quality Assurance and Quality Control Plans will assist the Oversight Official in developing a strategy to spot check the PRP's quality assurance program.

5.2 PRE-CONSTRUCTION CONFERENCE

The PRP will initiate a pre-construction conference prior to the start of construction on the project. The participants would include representatives of all parties involved in the Remedial Action (e.g., RPM, Oversight Official, PRP, Remedial Design Professional, Independent Quality Assurance Team, and Remedial Action Constructor). The purpose of this meeting is to establish relationships among all parties involved in the Remedial Action implementation. The agenda should include:

- Introduction of the members of each team;

- Discussion of EPA's expectations for the project;
- Review of general project scope and requirements specified in the Settlement Agreement;
- Review of the final Construction Quality Assurance and Quality Control Plans;
- Review of the project schedule;
- Establishment of scheduled meetings and briefings during construction;
- Review of roles and responsibilities of all parties;
- Review of document control procedures;
- Discussion of all key issues, concerns, and project goals;
- Procedures to resolve disputes or misunderstandings during construction;
- Review of emergency actions and the Contingency Plan; and
- Review of endpoint activities and procedures for project completion.

The tone of this meeting will help the RPM to determine the level of oversight necessary for the project.

5.3 REMEDIAL ACTION IMPLEMENTATION

5.3.1 Remedial Project Manager

It is the RPM's responsibility to monitor PRP compliance with the Settlement Agreement and all documents and plans included therein by incorporation or reference. The RPM uses all the information and interactions to monitor PRP compliance and has the flexibility to adjust the level of oversight as determined to be necessary. The following defines the RPM's role during Remedial Action Construction:

- Conduct progress meetings with the PRPs on a periodic basis during remediation to address the status of project construction, schedule changes, test results, observations and findings, issues of non-compliance, change orders, and upcoming

activities. The frequency of the meetings depends on the environmental significance of site activities and the level of oversight desired;

- Ensure that construction activities are not endangering public health and that the Contingency Plan is implemented in the event of an accident or emergency;

- Monitor the construction quality assurance program including review of the sampling results and testing data from the PRP and Independent Quality Assurance Team, and the Oversight Officials' summary of all inspection reports;

- Coordinate interaction among all government entities involved, including the State and local municipalities;

- Enhance community relations by accompanying representatives of the public or other agencies during site visits;

- Document all contacts with the PRPs concerning implementation of the Remedial Design and Remedial Action;

- Verify that the work required under the Settlement Agreement is complete, and initiate project closeout activities;

- Ensure that the PRP is in compliance with the Settlement Agreement. If it is determined that the PRP is failing to comply with the terms of the Settlement Agreement, approach the problem in a constructive manner:

  - Identify the problem and devise corrective actions that are consistent with the Settlement Agreement;

  - Document all contacts with the PRPs concerning the inadequacies of the implementation;

  - Discuss the proposed correction action with Regional management to ensure the RPM is maintaining a consistent Regional

approach in overseeing the PRP's response activities; and

- Contact the Office of Regional Counsel for advice on how to proceed in the event enforcement becomes necessary.

5.3.2 Independent Quality Assurance Team

The responsibilities of the Independent Quality Assurance Team include implementation of the activities specified in the Construction Quality Assurance Plan (e.g., inspection, sampling, documentation). Quality assurance is planned and systematic actions by the PRP to provide confidence that the constructed remedy meets project requirements. The Independent Quality Assurance Team is used to provide this level of confidence to the PRP by testing and inspecting the work of the Remedial Action Constructor. Typical activities may include:

- Submitting blind samples for analysis by the quality control inspection personnel and one or more independent laboratories;
- Confirming that regular calibration of testing equipment is properly conducted and recorded;
- Verifying that testing procedures are conducted consistently and in the prescribed manner;
- Confirming that the test data is properly recorded, validated, maintained, and interpreted;
- Reporting the results of the quality assurance activities to the PRP, including:
  - Review and interpretation of all data sheets and reports;
  - Identification of work that should be accepted, work that should be rejected, and work that may require special testing;
- Providing copies of test results to the Oversight Official and RPM;
- Verifying that implementation of the Construction Quality Control Plan is in

accordance with the Construction Quality Assurance Plan; and

- Maintaining a communication and coordination relationship with the Oversight Official concerning quality assurance activities and test results.

5.3.3 Oversight Official

The Oversight Official reports to the RPM and supports the RPM in monitoring PRP compliance with the Settlement Agreement, the plans and specifications, and the Construction Quality Assurance and Quality Control Plans. Responsibilities that the RPM may assign to the Oversight Official include:

- Attendance at the pre-construction conference, progress briefings, and any other meetings as required;

- Making on-site observations of the work in progress to determine if the work is generally proceeding in accordance with the plans and specifications, and the Construction Quality Assurance and Quality Control Plans. The role of the Oversight Official is to monitor the PRP's quality assurance program;

- Immediately notifying the authorized representative of the Remedial Action Constructor or PRP of any observed activities presenting imminent and substantial endangerment to the public health or welfare or environment, and following up with an appraisal of the situation to the RPM (see section 5.4);

- Reporting to the RPM any actions that the constructor and/or the PRP take in interpreting contract documents in a way that may materially affect the work in progress or intent of the plans and specifications;

- Reviewing change orders, work directives, and contract modifications made by the Remedial Action Constructor for consistency with the Settlement Agreement, and reporting the results of these reviews to the RPM;

- Reviewing progress reports of the constructor and furnishing the RPM with routine reports on the schedule and progress of work;

- Maintaining a diary or log of observations at the site, including interactions with all parties, results of tests, site visits, and questions, concerns or discussions about conformance with the approved design plans and specifications;

- Reviewing perimeter monitoring data submitted to evaluate if the action levels have been exceeded and if so, verifying that corrective actions were promptly taken;

- Reviewing certificates, operations and maintenance manuals, and other data required to be assembled and furnished by the constructor;

- Attending the pre-final/final inspection and reviewing the punch list of items requiring correction. Verifying that all punch list items have been completed or corrected; and

- Reviewing deliverables (e.g., Remedial Action Work Plan, Construction Quality Control Plan, and Project Closeout Report) submitted by the PRPs.

The Oversight Official is a representative of the EPA and does not have authority to authorize any deviation from the contract documents or assume any of the responsibilities of the constructor, subcontractor, or their superintendents. This includes advisement on or issuance of instruction concerning the constructor's techniques or performance of duties.

5.4 IMMEDIATE DANGER AND EMERGENCY RESPONSE

In the event any action during the performance of the remedial activities causes or threatens a release which may present an immediate danger to the on-site construction workers, the PRP shall take actions in accordance with the Health and Safety Plan. If there is a substantial danger is to the off-site public health or environment, the Contingency Plan (see Appendix B) shall be implemented. This plan is written for the local affected population. In either case, the EPA shall be notified.

During an emergency, the RPM and the Oversight Official should closely monitor the situation to determine that the Health and Safety Plan and Contingency Plan are being implemented. EPA does have the authority stop work on the site if the conditions present an imminent and substantial endangerment to the public health or welfare or environment.

5.5 PRE-FINAL/FINAL INSPECTION

The PRP conducts the pre-final and final inspection of completed work with EPA, the Oversight Official, and other agencies with a jurisdictional interest in attendance (e.g., the State). The purpose of the inspection is to determine if all aspects of the plans and specifications have been implemented at the site. If any items have not been completed the PRP will develop a punch list which details the outstanding items still requiring completion or correction before acceptance of work. Acceptance of work may not be granted until the startup and operation of treatment systems. This may also include a demonstration that performance standards have been met.

The RPM and the Oversight Official should take careful notes of all corrective and extra work required to meet the requirements of the design plans and specifications. These notes should be carefully compared to the punch list developed by the PRP.

A final inspection should be conducted when all the items on the punch list have been completed. All items indicated as requiring correction on the punch list should be reinspected, and all tests that were originally unsatisfactory should be conducted again. A final punch list should be developed for any outstanding deficiencies still requiring correction.

5.6 PROJECT CLOSEOUT REPORT

At the completion of the Remedial Action and correction of all punch list items, the PRP (usually the Resident Engineer) prepares a Project Closeout Report which certifies that all items contained in the Settlement Agreement and any incorporated documents (e.g., plans and specifications) have been completed. The report includes documentation (e.g., test results) substantiating that the performance standards have been met and also includes "Record Drawings" of the project. The Oversight Official reviews the Project Closeout Report and verifies that all changes and variations from the original contract drawings have been made on "Record Drawings".

The RPM then initiates the project completion and deletion process as described in Procedures for Completion and Deletion of National Priority List Sites", OSWER Directive 9320.2-3A, EPA, April 1989.

APPENDIX A

CONSTRUCTION QUALITY ASSURANCE PROGRAM

A.1 INTRODUCTION

The terms quality assurance and quality control are frequently, and erroneously, used interchangeably. Since quality control is a part of quality assurance, maintaining a clear distinction between them is difficult but important. Quality assurance is planned and systematic actions necessary to provide confidence that the construction will perform satisfactorily and conform with project requirements. Quality control is the project specific activities that apply the quality assurance policies.

If strict construction related quality assurance and quality control guidelines are established and followed, the project will be constructed according to the project's requirements. The PRP is responsible for establishing the quality assurance program appropriate for the proposed action, and to provide adequate funds to implement the program. The constructor is responsible for implementing and maintaining the construction related quality control program. The exact scope of the quality assurance program and its relation to the quality control program should be clearly explained to the constructor before construction begins.

A.2 CONSTRUCTION QUALITY ASSURANCE PLAN

The Construction Quality Assurance Plan is a document that describes the site specific components of the quality assurance program. The purpose is to ensure, with a reasonable degree of certainty, that a completed project meets or exceeds all design criteria, plans, and specifications. Although the overall content of the Construction Quality Assurance Plan depends on the site specific nature of the site, at a minimum, several elements should be included in the plan. These elements are briefly summarized as follows:

- Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the site remediation;
- The qualifications of the quality assurance personnel to demonstrate they possess the training and experience necessary to fulfill their identified responsibilities;

- The observations and tests that will be used to monitor construction, and the frequency of performance of these activities;

- The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures as addressed in the plans and specifications; and

- Description of the reporting requirements for quality assurance activities including such items as daily summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, final documentation. Also describe the provisions for the final storage of all records consistent with the requirements of the Settlement Agreement.

Although quality assurance is, by definition, a system of overview activities, the Construction Quality Assurance Plan must also include a detailed description of the inspection activities that will be used to monitor and control construction quality. The Construction Quality Assurance Plan documents the PRP's commitment to quality assurance and is tailored to the specific project to be constructed. An example of a quality assurance program can be found in Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, U.S. EPA, October 1986, OSWER Directive 9472.003.

APPENDIX B

CONTINGENCY PLAN

The Contingency Plan is written to protect the local affected population in the event of an accident or emergency. It may incorporate an Air Monitoring Plan and a Spill Control and Countermeasures Plan, if applicable, for the site. The following is a preliminary list of items that could be included in a Contingency Plan.

- Name of person responsible for responding in the event of an emergency incident;

- Plan and date for meeting with the local community, including local, State and Federal agencies involved in the cleanup, as well as local emergency squads and hospitals;

- First aid and medical information including names of personnel trained in first aid; clearly marked map with the loactions of medical facilities; all necessary emergency phone numbers; fire, rescue, local hazardous material teams; and National Emergency Response Team;

- Air Monitoring Plan - Air monitoring will be necessary at any site when the site-specific risk assessment specifies a risk via the inhalation/air transport pathway. This section details the minimum requirements for air monitoring both on-site and at the perimeter of the site. The chemical constituents identified at the site as part of the risk assessment should be the basis for pollutant sampling and measurement of pollutants in the atmosphere. Air monitoring may include personnel monitoring, on-site and/or off-site area monitoring, and perimeter monitoring. Trigger concentrations to implement the Contingency Plan should be specified; and

- Spill Control and Countermeasures Plan which will provide contingency measures for potential spills and discharges from materials handling and/or transportation. It describes methods, means, and facilities required to prevent contamination of soil, water, atmosphere, uncontaminated structures, equipment or material from the discharge of wastes due to spills; provides for equipment and personnel

to perform emergency measures required to contain any spillage and to remove and properly dispose of any media that become contaminated due to spillage; and provides for equipment and personnel to perform decontamination measures that may be required to remove spillage from previously uncontaminated structures, equipment, or material.

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