Chapter Six

6. Remedial Design/Remedial Action (RD/RA)

The major activities of the Remedial Design (RD) and Remedial Action (RA) phase of the Remedial Action Process follow the completion of the Record of Decision (ROD) and lead to Site Closeout. The activities performed after the ROD are based on the information received during the RI/FS.

Response actions during the RD and RA phases include implementing the selected treatment, and on-site/off-site monitoring. These activities will normally be accomplished by a Remedial Action Contract (RAC) contractor selected by the EFD/EFA. Initially, the RPM should direct the contractor to develop an RD/RA work plan before remedial activities begin. The plan should be site-specific and include the information from previous plans and procedures developed during the RI/FS. These previous plans can be modified and changes incorporated by reference in the RD/RA work plan. Pre-design activities and requirements should be outlined before beginning the design phase and include scheduling, fast-track structuring, setting milestones, planning concurrent activities, and costing and budgeting. Additional guidance for implementing RD/RAs can be found in the *Superfund Remedial Design and Remedial Action Guidance* (EPA, June 1986).

6.1 REMEDIAL DESIGN (RD)

The purpose of the RD is to convert the conceptual design for the selected remedy into a final design that is implemented. The frequency and level of internal design reviews are at the discretion of the RPM within the limits set forth in CERCLA or RCRA orders or permits. If during the RD step new information comes to light that would substantially alter the scope, cost, implementability, or effectiveness of the previously selected remedial action, the Selection of Remedy step may need to be repeated to include public participation requirements. Chapter 10 contains additional guidance for when this situation occurs.

Following the preparation of RD documents, the Community Relations Plan, prepared during RI/FS Scoping, should be reviewed and revised. After completion of the final design, the RPM will issue a fact sheet to notify the media and public and, as appropriate, conduct a public briefing.

6.1.1 Remedial Action Contract (RAC)

The RAC can be used to streamline the design-build process for simple remediation projects. In such cases, preparation of a detailed design of the project is not necessary. Under the RAC contract, the contractor can prepare work plans based on the RI/FS and the ROD.

6.1.2 Design Guidance For Remedial Technologies

The NAVFAC Criteria Office and the National Defense Center of Environmental Excellence have established a database of non-mandatory design guidance for remedial technologies on the Construction Criteria

Base CD-ROM system. The goal of the guidance is to assist designers in determining and identifying important remedial technology design parameters. The criteria office will later expand the design package and construction/ performance lessons learned data, based on new information received from users.

6.1.3 Permits and Approvals

Permits, approvals, and site access agreements, if required, will generally be obtained during RD. Cooperation between the RPM and the installation legal, engineering, and public affairs staff may be needed to secure the permits.

Remedial actions that are conducted entirely on site and in accordance with CERCLA Sections 104, 106, 120, 121 or 122, do not require federal, State or local permits to engage in the remediation activity; CERCLA § 121(e), as codified in 42 U.S.C § 9621 (e) (2001). On-site remedial activities include the aerial extent of contamination and all suitable areas in very close proximity to the contamination requiring the response action.

Figure 6-1 lists the elements of the RD step.

6.2 REMEDIAL ACTION (RA)

Upon completion of the RD, the EFD/EFA will begin implementation of RA. The RA step involves the award of a contract or Delivery Order to the RAC contractor to construct the selected remedy and implement the detailed design plans or performance specifications. RA activities require close cooperation between the Resident Officer in Charge of Construction (ROICC), the RPM, and the installation. The RPM is the technical manager for the RA and is responsible for oversight functions such as coordinating with EPA, the State, and local officials, maintaining the administrative record, participating in appropriate community relations efforts, and assuring overall quality assurance/quality control. The RA step involves two sub-categories, Remedial Action Construction and Remedial Action Operation.

6.2.1 Remedial Action Construction

RA Construction is the period during which construction is occurring to implement the remedy. Remedial Action Operation is the period, following RA Construction, needed to operate installed equipment to accomplish remedial objectives. If the remedy is accomplished by actions taken during RA Construction, RA Operation is not needed and does not occur.

6.2.2 Remedial Action Operation (RAO)

Following the completion of the RA Construction phase and when the Remedy in Place (RIP) milestone has been attained, the project enters the Remedial Action Operation (RAO) phase.

RAO is the period during which the remediation system is operating or chemical or biological processes are occurring to achieve the cleanup objective identified in the ROD or equivalent agreement with State or Federal regulatory agencies.

Elements of the Remedial Design Step

Selection of Remedy → **Remedial Design** → **Remedial Action**

Purpose	• Prepare Scope of Work, specifications, and bid documents • Select Remedial Action contractor • Prepare RD/RA Work Plan
Potential Subsequent Actions	• Remedial Action
Pre-award Activities	• Prepare Scope of work, specifications, and bid documents (EFD/EFA) • Advertise (EFD/EFA) • Evaluate bids (EFD/EFA) • Select contractor (EFD/EFA) • Award contract(s) (EFD/EFA)
Post Award Activities	• Monitor contractor's effort (EFD/EFA) • Revise Community Relations Plan (CRP), as necessary (Installation) • Conduct pilot scale testing, as necessary
Documentation	• Revised CRP (Installation) • Scope of Work, specifications, and bid documents (EFD/EFA) • RD/RA Work Plan • Remedial Design Fact Sheet

Figure 6-1: Elements of the Remedial Design Step

RAO includes active remediation such as groundwater pump and treatment systems and air sparging/soil vapor extraction systems that require extended operation time to reduce contaminants to cleanup standards. RAO also includes passive remediation technologies such as monitored natural attenuation (MNA). Although, MNA requires an extended period of monitoring, it is considered RAO until RC has been achieved.

The RAO should be evaluated annually to ensure it is efficiently meeting the project goals as defined. Annual assessments should include a review of the project goals, review and revision of the current conceptual site model, evaluation of progress toward remediation goals, and evaluation of the remediation system and unit processes to ensure the appropriate technology is being employed to reach cleanup goals.

The data collected during the remedial action monitoring will be used to evaluate the effectiveness and efficiency of the remediation. Using this data, RPMs can make decisions to optimize the remedial action by modifying the system, modifying the monitoring program, or implementing a new remediation strategy or technology. Annual reviews should be conducted well in advance of budget planning for the following year so that changes in funding needs can be included in budget requests.

The RAO is complete when cleanup goals have been reached. At that point the Response Complete milestone has been achieved and the site either enters the Long-Term Management phase or preparations for Site Closeout are began.

Additional information about LTM and RAO optimization as they relate to Navy programs is presented at the Navy RAO-LTM web page: http://erb.nfesc.navy.mil/support/work_grp/raoltm/main.htm.

Figures 6-2, 6-3 and 6-4 list elements of RA Construction, RAO, and Post-Project Activities, respectively.

6.2.3 Resident Officer In Charge of Contracting (ROICC)

The ROICC is the construction manager for the RA and is responsible for ensuring that the work is accomplished per plans and specifications and in a manner that protects human health, welfare, and the environment. Because the selected RA has been agreed upon by regulatory agencies, the ROICC cannot make field changes without consultation with the RPM, the Contracting Officer's Technical Representative (COTR) and the Contract Specialist.

The ROICC should monitor the contractor's HSP and other procedures for compliance with the Occupational Safety and Health Administration regulations 29 C.F.R. Part 1910; 42 U.S.C. §§ 651-678 (2001). The ROICC will ensure that the DON and the remediation contractor follow an approved QAPP, both for implementing the selected remedy and verifying via field sampling and analysis that specified cleanup levels have been attained.

In addition to ROICCs, the Naval Technical Representatives (NTR) monitors RA construction.

Elements of Remedial Action Construction

Remedial Design → **RA Construction** ⇢ **RA Operation**

Purpose	• Install remedial technologies
Potential Subsequent Actions	• Remedial Action Operation, or • Long Term Monitoring, or • No Further Action
Tasks	• Field activity management (Installation and EFD/EFA)
Documentation	• Worker Health and Safety Plan • Contractor documentation of work performed, equipment installed, site worker, and visitor logs; compliance with Worker Safety and Health Plan; and compliance with Data Quality Objectives • "As-built" drawings (EFD/EFA) • O&M Manual for electro-mechanical equipment (EFD/EFA)

Figure 6-2: Elements of Remedial Action Construction

Elements of Remedial Action Operation

RA Construction → **RA Operation** → **Post-Project Activities**

Purpose	• Operate installed equipment
Potential Subsequent Actions	• Post-Project Activities • Long Term Monitoring • No Further Action
Tasks	• Operate installed equipment
Documentation	• Sampling and Analysis Plan for post-project activities • "As-built" drawings (EFD/EFA) • O&M Manual for electro-mechanical equipment (EFD/EFA)
Additional Site Management Activities	• Program O&M resources for construction activities (EFD/EFA)

Figure 6-3: Elements of Remedial Action Operation

Elements of the Post-Project Activities Step

Remedial Action → **Post-Project Activities**

Purpose	• Ensure continued compliance with project goals
Potential Subsequent Actions	• No Further Action • Reinitiation of Response Action, if necessary
Tasks	• Periodic review of compliance with project goals (Installation and EFD/EFA) • Operation and maintenance of electro-mechanical equipment (Installation) • Monitoring (Installation)
Documentation	• Monitoring reports (Installation) • Compliance review reports (Installation)
EPA/State Activities	• Review monitoring reports and 5-year compliance reviews as required

Figure 6-4: Elements of the Post-Project Activities Step

6.2.4 Off-Site Disposal Facility Approval Requirements

The "Off-site Rule" provides that a facility used for the off-site management of CERCLA wastes must be in physical compliance with RCRA, or other applicable Federal and State laws, 40 C.F.R. § 300.400 (2000). In addition, the following criteria must be met:

Units at RCRA Subtitle C facilities receiving CERCLA wastes must not be releasing any hazardous substances to the air, soil, groundwater or surface water;

Receiving units at Subtitle C land disposal facilities must meet minimum technology requirements;

All releases from non-receiving units at land disposal facilities must be addressed by a corrective action program prior to using any unit at the facility; and

Environmentally significant releases from non-receiving units at Subtitle C treatment and storage facilities, and from all units at other than Subtitle C facilities, must also be addressed by a corrective action program prior to using any unit at the facility for the management of CERCLA wastes.

These requirements are also applicable to RA at DON sites where wastes are being transported off-site for treatment or disposal. Off-site areas are areas that are not "On-site" (those areas, which include all suitable areas in very close proximity to the contamination, necessary for implementation of the response action.) The EPA Regional Offices maintain a list of acceptable off-site disposal facilities.

6.2.5 Remedial Action Documentation Requirements

The RPM should insure that the information repository contains a listing and a copy of all RA and O&M information reporting requirements and data needed to support site closeout and delisting.

6.3 LONG TERM MANAGEMENT

Long-Term Management (LTMgt) occurs after Response Complete (RC) has been achieved at a site. LTMgt is required at sites that have hazardous substances, pollutants or contaminants remaining at the site after RC, which restricts use of the site. This situation often arises when the DON makes the decision to remediate a site to restricted land use (e.g. recreational) risk-based cleanup levels. LTMgt will require long-term monitoring and usually some type of land use control for the site. The land use control may be engineered control or institutional control. The DON is responsible for maintaining land use controls and the long-term monitoring program.

In accordance with Section 121(c) of CERCLA, if hazardous substances, pollutants, or contaminants remain at a site after RC (for example, in the situation where land use controls have been implemented), the site will be subject to 5-year reviews. 42 U.S.C. § 9621 (c) (2001). Data collected from the long-term monitoring program will be reviewed to ensure that human health and the environment are being protected.

The RPM in coordination with the installation should submit the 5-year review report to the regulators, as appropriate, to obtain their comments.

Planning for and the conduct of LTMgt is the responsibility of NAVFAC using ER,N funds for a period of five years after RC. After that time, it becomes the responsibility of the installation commander to plan, fund, and conduct any required LTMgt functions. During the first two years of the LTM period, NAVFAC will develop and implement a long-term maintenance, monitoring and management plan (LTMgt Plan). NAVFAC will provide the LTMgt Plan and cost data to the installation commander to allow the timely budgeting for any funds required to continue the LTMgt beyond the first five-year period. The LTMgt Plan will include requirements for 5-year reviews after turnover of IRP responsibilities to the installation commander.

Although LTMgt responsibility for a site devolves to the installation commander five years after RC, in general, the planning and conduct of all 5-year reviews at the installation will remain with NAVFAC using ER,N funds until the "last" site at the installation achieves RC, and for a period of 5 years thereafter. The installation commander becomes responsible for conducting and funding 5-year reviews using installation O&M funds five years after that point.

See DON Policy Memorandum 99-02; *Land Use Controls, Interim Final* (25 May 1999).