



ENVIRONMENTAL RESTORATION

U.S. Army Environmental Center

ENVIRONMENTAL SITE CLOSEOUT

After nearly two decades of effort and an investment of billions of dollars, the Army's environmental cleanup program is moving toward site closeout at many of its installations. "Site closeout" refers to the point at which the Army will no longer engage in active management or monitoring at an environmental restoration site, and no additional environmental funds will be expended unless additional remedial action is warranted by unforeseen future events.

The initial focus of the cleanup program was on finding sites with problems (site identification), determining how best to handle cleanup at these sites (remedy selection), determining which sites to clean up first (risk-based prioritization), and beginning the cleanup process (remediation design and construction). The "site closeout process" refers to the steps in the cleanup process after the cleanup decision has been made, from initiation to completion of remedial action. Through a joint effort by the Services, DoD, EPA and several state regulatory agencies, the existing statutory and regulatory requirements that affect closeout of DoD sites have been consolidated into a single working

document: *The Environmental Site Closeout Process* guide (Closeout guide).

While the restoration program is measured on progress toward achieving Defense Planning Guidance goals of Remedy-in-Place (RIP) and Response Complete (RC) for the various relative risk site categories, RIP and sometimes RC do not mark the end of the restoration process. The Closeout guide was developed to pull together all available guidance on what is required to proceed to final site closeout, to raise the awareness of the Remedial Project Manager (RPM) and other stakeholders on just what is required to achieve site closeout, and to ensure that proper planning is conducted for the last steps in the program. The process identified in the Closeout guide is not a new one. Existing requirements have been gathered and organized into an overall site closeout framework that accommodates multiple regulatory frameworks. The Closeout guide describes actions that should be taken to reach site closeout, although the level of effort necessary will vary based on site-specific conditions. Since guidance and policy are still being developed and

Activities That May Remain After RIP/RC

- Operation and maintenance of cleanup systems
- Implementing and monitoring institutional controls
- Community involvement
- Performance reviews of cleanup systems
- Cleanup system modifications or upgrades
- Final Closeout Reports for installations
- Long-term monitoring
- Cleanup system and monitoring well decommissioning

revised for the final steps of restoration, the Closeout guide should be treated as a starting reference with leads to other guidance that may need to be researched for the latest version. The major guidance documents from which the guidance was derived are listed in Section 9 of the Closeout guide.

The Closeout guide should be used as a starting point for discussion among the stakeholders at a particular installation to make knowledgeable decisions about the most effective manner of integrating and applying these requirements at their installation.

Why Do We Need the Closeout Guide Now?

The Army environmental restoration program has been under way for over a decade, and there are now many installations whose cleanup efforts are nearing completion. For such installations, it has become apparent that the site closeout process represents uncharted territory. For many years, environmental program management guidance focused on completing the studies and analyses necessary to make an informed decision regarding selection and implementation of environmental remedies. Now that many installations have implemented their selected remedies and are in the remedial action operation phase, the next important step is to consider the requirements for completing and documenting the closeout of sites once cleanup goals have been met and other environmental responsibilities have been fulfilled.

Remedial Project Managers (RPMs), in coordination with their Cleanup Teams, are expected to plan for site closeout based on available guidance documents from the EPA, DoD/DA, and states. However, many of these separate guidance documents are not in complete agreement with each other with respect to definitions, milestones and requirements. The Closeout guide is intended as a planning resource that has already completed most of the groundwork in consolidating the guidance from the universe of available sources into a single document. Using the Closeout guide, the Cleanup Teams can save a significant amount of time and effort, and increase the amount of national consistency in planning for site closeouts.

For those installations still addressing restoration in the pre-decisional analysis phase, the Closeout guide can be an important tool for considering future requirements and incorporating those requirements into current decision making. For example, documentation requirements for future reviews and

closeout of sites can be established up front and incorporated into decision documents and out-year schedules and budgets.

How to Use the Closeout Guide

The Closeout guide should be used by the Cleanup Team to facilitate the environmental site closeout process and plan and tailor their site closeout efforts. It is not intended to be a prescriptive document that must be followed explicitly. The process described in the Closeout guide should not be viewed as a rigid process; rather, it should be viewed as a flexible management tool that can be applied to the specific situations that must be addressed by the RPM/BEC at each installation. Users of the Closeout guide should recognize that, in most cases, only a portion of these requirements would apply at a particular installation. Restoration project team members should discuss the most effective manner of integrating and applying these requirements at their installation. The Closeout guide can also be used for projecting future resource requirements associated with site closeout, including programming and budgeting estimates.

Site Closeout Considerations

- CERCLA and RCRA Corrective Action Sites
- National Priorities List (NPL) and Non-NPL Facilities
- Removal and Remedial Actions
- BRAC and Active Installations
- Federal and State Regulatory Requirements
- Cleanup Agreements, including Federal Facility Agreements (FFAs)
- Community Involvement

In planning a site closeout strategy for an installation, restoration project teams must address a number of considerations (see box above), including the regulatory regime(s) that apply to the installation, the installation's regulatory status; and the cleanup strategies employed and actions taken to date. The Closeout guide addresses each of these considerations in greater detail. Restoration project team members are encouraged to consider all of these factors in developing their strategy and to incorporate the relevant requirements as appropriate.

Overview of the DERP Restoration Process

DoD/DA employ a risk management approach in the environmental restoration program that protects human health and the environment in a cost-effective manner. In risk management, several types of information are used collectively to make decisions about cleanup and

and the protectiveness of completed remedies, including the possibility that reviews may result in the need to undertake system modification or replacement. Five-year reviews are not necessarily a requirement at all sites, only where the selected remedial action results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited

use and unrestricted exposure. Figure 2 also reflects the general requirement under both RCRA and CERCLA for community involvement efforts. In addition, at NPL installations, deletion (or “delisting”) of the installation (or partial deletion of individual sites/OUs) from the NPL is part of the overall site closeout process. [See NPL Deletion fact sheet].

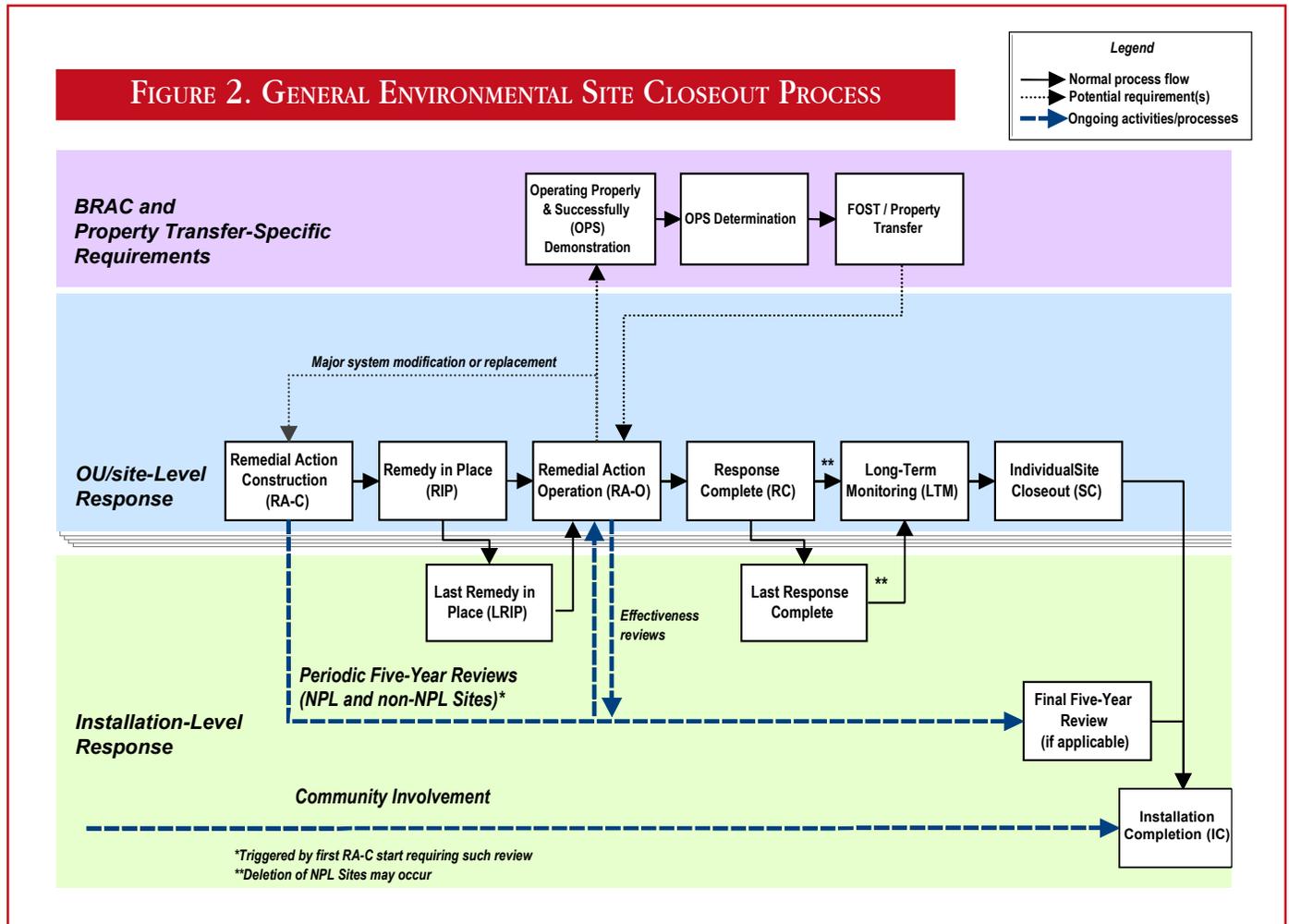


Table 1 describes phases and milestones identified in the *DERP Management Guidance* and gives examples of those milestones for various remedy scenarios. These scenarios are discussed in greater detail in the Closeout guide.

TABLE 1. DESCRIPTION OF MAJOR PHASES AND MILESTONES IN THE SITE CLOSEOUT PROCESS

Phase/Milestone	Definition	Example Remedy Scenario
Remedial Action Construction (RA-C)	The RA-C phase occurs while the final remedy for a site, or group of sites under an operable unit, is being put in place.	For on-site treatment, this phase comprises construction of the waste treatment facility. Remedies such as excavation or groundwater monitoring may not have an RA-C phase.
Remedy in Place (RIP)*	The RIP milestone signifies the completion of the RA-C phase, and that the remedy has been implemented and has been demonstrated to be functioning as designed (i.e., “all testing has been accomplished and the remedy will function properly,” as defined in the <i>DERP Management Guidance</i>).	For on-site treatment, this could occur when the treatment facility demonstrates it can properly treat waste.
Remedial Action Operation (RA-O)	The RA-O phase occurs while a remedy is being operated to achieve the cleanup objective (traditionally associated with “operation and maintenance” (O&M)), but cleanup goals have not yet been reached.	Operation of a groundwater pump and treatment remedy or soil vapor extraction; monitoring of natural attenuation prior to achievement of cleanup goals. Containment remedies such as landfills do not generally have an RA-O phase (RC occurs concurrently with RIP).
Operating Properly and Successfully (OPS)	OPS is a milestone that demonstrates a remedy is operating properly and successfully prior to deed transfer of Federally owned property to a non-Federal recipient prior to achieving cleanup goals. Applicable to Federal property transfer; e.g., at BRAC installations.	For a groundwater remedy, an OPS demonstration might include evaluating whether the pump and treat system is performing adequately so that achievement of cleanup goals appears likely.
Response Complete (RC)	The RC milestone signifies that cleanup goals for a site or group of sites under an OU have been met, the decision has been documented, and any necessary regulatory requirement for notification or application for concurrence has occurred.	For excavation and off-site disposal, this occurs when all contaminated soil has been properly removed and disposed. For longer-term remedies, RC may not be achieved for years or decades.
Long Term Monitoring (LTM)	The LTM phase may include environmental monitoring that occurs after cleanup goals have been achieved to ensure that the remedy remains protective of human health and the environment; administrative management of use restrictions; and operation and maintenance of the remedy. Not all remedies require LTM, while some may require indefinite LTM.	Containment remedies such as landfills can require indefinite LTM to ensure contaminants are not migrating from the site at levels harmful to public health or the environment.
Site Closeout (SC)	<p>SC implies that DoD has completed active management and monitoring at an environmental restoration site, and no additional environmental restoration funds are expected to be expended at the site unless the need for additional remedial action is demonstrated.</p> <p><i>* Last Remedy in Place (LRIP) signifies that the RIP milestone has been reached for every site at the installation</i></p>	For practical purposes, SC occurs when cleanup goals have been achieved that allow unrestricted use of the property (i.e., no further LTM, including institutional controls, is required).

FIGURE 3. DoD ENVIRONMENTAL RESTORATION PHASES AND MILESTONES

(Not every step is required.)

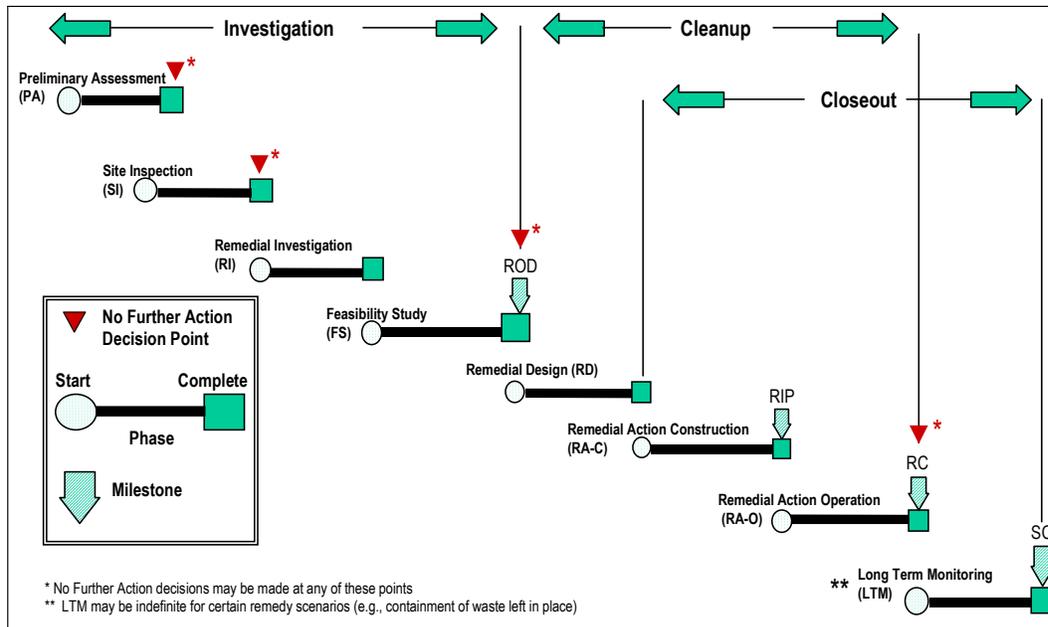
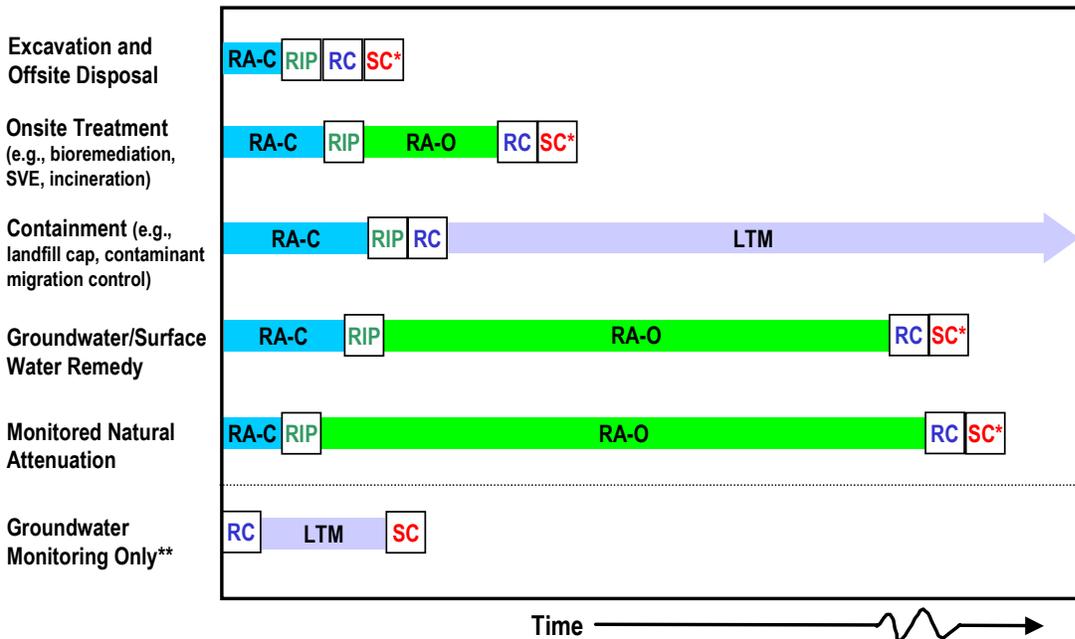


Figure 3 is not able to illustrate the variability in the applicability of these phases and milestones from site to site. Some of the phases may last from several months to multiple decades; some phases and milestones may not be applicable. In particular, there are multiple points in the process at which a decision can be made that no further response action is required; properly documented, these decisions constitute achievement of response complete and/or site closeout. In other cases, a chosen response action may not require all phases to achieve site closeout, and multiple milestones may be attained simultaneously.

As illustrated in Figure 3, some of these terms represent milestones (single points in time for a given site or OU) whereas others represent phases with longer durations. Schedules for a mature installation restoration program should indicate when major milestones will be achieved and the approximate durations of the phases, as required by DoD reporting conventions.

FIGURE 4. APPLICABLE PHASES/MILESTONES AND TIMEFRAMES FOR TYPICAL REMEDY SCENARIOS*



*A final remedy may be a hybrid of some or all of these remedy scenarios.

SC* = Indefinite LTM may be required for some sites (see Table 2.0).

** May be the only remedy selected at a site. Also applicable where previous Removal Actions and/or IRAs have achieved cleanup objectives, and the final remedy decision finds that only monitoring is needed to ensure permanence of the remedy.

Figure 4 attempts to capture the variety of ways in which these terms apply to multiple remedy scenarios. For example, containment remedies such as landfills have a substantial RA-C phase, but no RA-O phase. In the case of monitored natural attenuation, the monitoring is considered RA-O until cleanup goals have been achieved.

Under all scenarios, some form of LTM may be required if the cleanup goals do not allow for unrestricted land use or if a period of monitoring is required to verify that the remedy has succeeded in protecting human health and the environment. In some cases, where a remedy was specifically chosen to leave contamination in place (e.g., through containment), LTM may be required as long as

the contamination remains, with associated monitoring of institutional controls and Five-Year Reviews of the remedy's protectiveness. These remedy scenarios, and the specific applicability of the site closeout phases and milestones, are discussed in greater detail in the Closeout guide.

Specific legal requirements and process steps for achieving the DoD milestones are described in greater detail in the Closeout guide. For each phase/milestone, requirements under CERCLA and RCRA are described separately. For non-NPL sites/OUs not managed under RCRA, documentation during the site/OU closeout process should generally be consistent with the NCP Remedial Action Report format.

Roles of the Cleanup Team

In the site closeout process, the Cleanup Team remains DoD's mechanism for getting the job done. The Closeout guide was developed to 1) pull together all available guidance on what is required to proceed to final site closeout; 2) to raise the awareness of the RPM and other stakeholders on just what is required to achieve site closeout; and 3) to ensure that proper planning is conducted for the last steps in the program. The Cleanup Team is encouraged to use the Closeout guide as a reference, but must recognize that each installation will have unique requirements and opportunities for efficiencies. The Cleanup Team must consider those differences in order to effectively plan and execute the final steps of the restoration process.

Roles of the Cleanup Team

- Understand Federal and state requirements for various components of site closeout
- Ensure requirements beyond Last Remedy in Place are fully characterized and budgeted
- Consider innovative, flexible, and streamlined approaches to expedite the site closeout process and manage costs

More Information

Additional questions on Site Closeout can be addressed to:

Mr. Jim Daniel

U.S. Army Environmental Center

(410) 436-1501 • (DSN 584)

James.Daniel@aec.apgea.army.mil

FIGURE 3. DoD ENVIRONMENTAL RESTORATION PHASES AND MILESTONES

(Not every step is required.)

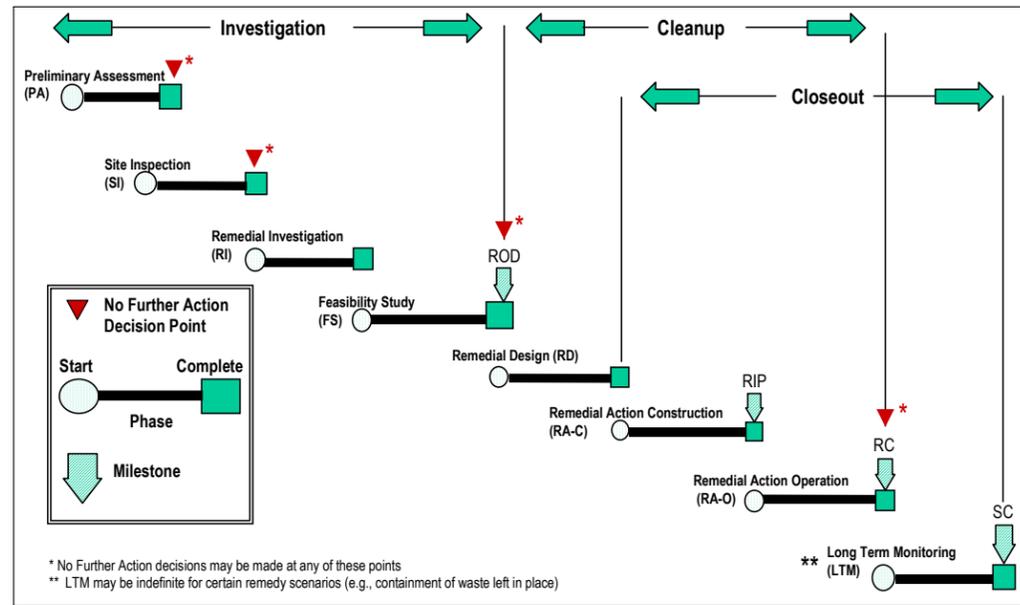


Figure 3 is not able to illustrate the variability in the applicability of these phases and milestones from site to site. Some of the phases may last from several months to multiple decades; some phases and milestones may not be applicable. In particular, there are multiple points in the process at which a decision can be made that no further response action is required; properly documented, these decisions constitute achievement of response complete and/or site closeout. In other cases, a chosen response action may not require all phases to achieve site closeout, and multiple milestones may be attained simultaneously.

As illustrated in Figure 3, some of these terms represent milestones (single points in time for a given site or OU) whereas others represent phases with longer durations. Schedules for a mature installation restoration program should indicate when major milestones will be achieved and the approximate durations of the phases, as required by DoD reporting conventions.

its timing, such as the remedial investigation/feasibility study (RI/FS), risk assessments, public health assessments, relative risk site evaluations, and other management factors.

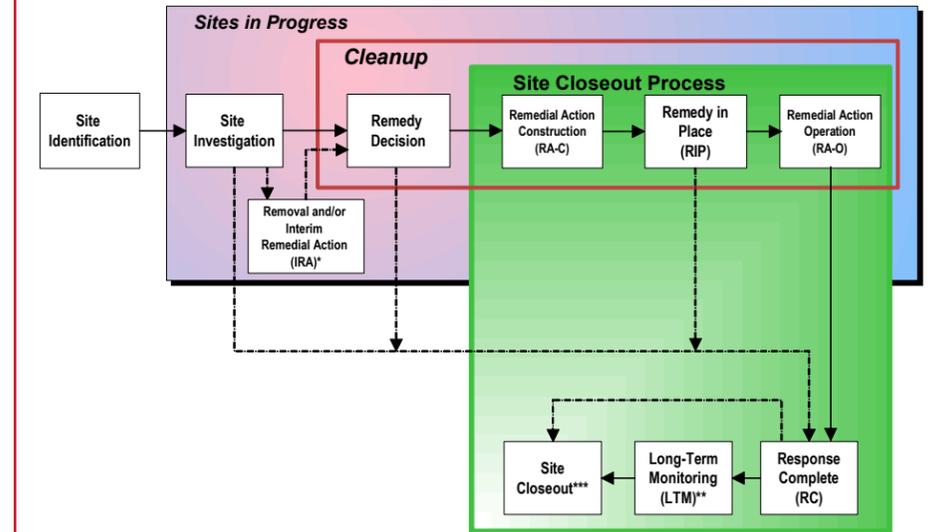
The major phases associated with the DoD environmental restoration process are shown in Figure 1. Initially, **site identification** (through records searches and/or visual inspections) produces a candidate list of areas of concern that warrant further **site investigation**.

The site investigation can result in an assessment of potential remedial actions that may be necessary to address any environmental contamination that has been found, including a “proposed plan” for remediation with associated public participation. Both site identification and site investigation may result in a decision that no environmental restoration is required, or in the need for a **removal action**. Similarly, **interim remedial actions** are commonly undertaken as components of larger actions for which a decision document has not yet been finalized, or to minimize or significantly reduce risks during ongoing investigatory efforts.

The **remedy decision** formally documents DoD’s decision on a method for final cleanup of contamination, including the “no-action” option where supported by analysis. **Remedial action construction** (if appropriate) can then begin, and **remedial action operation** (ongoing cleanup) can commence once the remedy has been constructed. In certain cases, a selected remedy (e.g., a landfill cap or other containment of contamination) may require only construction and no active, ongoing cleanup in order to achieve cleanup goals. **Response complete** (cleanup goals met) is the point at which the remedy has achieved the required reduction in risk to human health and the environment. Upon response complete, a remedy may require **long-term monitoring** of effectiveness to ensure that the cleanup goals continue to be met; in some instances, this monitoring may be required indefinitely. Lastly, when cleanup responsibilities have been completed at a site, **site closeout** can occur.

Much guidance has already been prepared to address the first few steps of “Sites in Progress” in Figure 1; the Closeout guide addresses the subsequent steps that constitute the Site Closeout Process.

FIGURE 1. DEFENSE ENVIRONMENTAL RESTORATION PROCESS



* Removal and/or Interim Remedial Actions may occur throughout process.
 **Some sites may require indefinite LTM.
 ***Sites may be reevaluated, if necessary.

Adapted from FY 1997 Defense Environmental Restoration Program Annual Report to Congress

General Site Closeout Process

The Closeout guide covers program execution after the cleanup decision has been made and remedial action is scheduled to begin. From this point forward, efforts should be focused on identifying the steps required to complete and close out the remedial action (i.e., the environmental site closeout process). The environmental site closeout process is described in the Closeout guide in terms of the major phases and milestones identified in the *DERP Management Guidance*. These are:

- Remedial Action Construction (RA-C)
- Remedy in Place (RIP), the culmination of RA-C
- Remedial Action Operation (RA-O)
- Response Complete (RC)
- Long-Term Monitoring (LTM)
- Site Closeout (SC)

The environmental site closeout process is shown generally in Figure 2, in terms of the DoD reporting milestones. In addition, Figure 2 integrates the general requirement, at installations transferring property, to demonstrate that a remedy is **operating properly and successfully** before a Finding of Suitability to Transfer (FOST) can be made and property transfer by deed can occur. Figure 2 also shows the ongoing requirement (both at National Priorities List (NPL) installations and non-NPL installations) to conduct five-year reviews of the effectiveness of ongoing remedies