

## 2.0 PLANNING

Planning in the EM Program is driven by regulatory decision documents, the DOE Strategic Plan, the EM Vision, and the most recent *Accelerating Cleanup: Paths to Closure* document.

Project baselines are developed to reflect planning assumptions and decisions. Project baselines, which define the planned scope, schedule, and cost for all EM work, are developed for each EM Project and are the fundamental building blocks for EM planning. Project baselines are integrated at the site level and validated. Information from the project baselines is summarized in Program planning tools, including PBSs, disposition maps, Site Critical Paths, and Programmatic Risk Management Plans. The information in these program-planning tools is evaluated from a National Program integration perspective, and improvements and changes are identified for discussion with the site and for possible incorporation into project baselines. Annually, information from the PBSs and other program management tools is used to update program planning documents, including the Site *Accelerating Cleanup: Paths to Closure* for each Operations/Field Office, the EM *Accelerating Cleanup: Paths to Closure*, and the DOE Annual Performance Plan. Throughout the planning process, planning information is made available to stakeholders, regulators, and Tribal Nations for their review and input. These steps are summarized in Figure 5, EM Planning Process. Information from the planning process becomes the starting point for the budgeting process, and it also is used for programmatic analysis and for external program reporting.

It is essential that the concepts from the Integrated Safety Management System and DOE Policy 450.04 and *Department of Energy Acquisition Regulations* (DEAR) requirements for safety and health be incorporated within the EM planning process. Analysis and integration of safety management activities that directly affect the successful completion of Projects should be integrated into the planning process. Additional guidance is provided in DOE Policy 450.5 and the *EM Functions, Responsibilities, and Authorities Manual* (FRAM).

Each element of the EM planning process is described in the following sections. For National Programs managed by Headquarters, responsibilities for planning, budgeting, execution, and evaluation may be performed by Headquarters in conjunction with the Field.

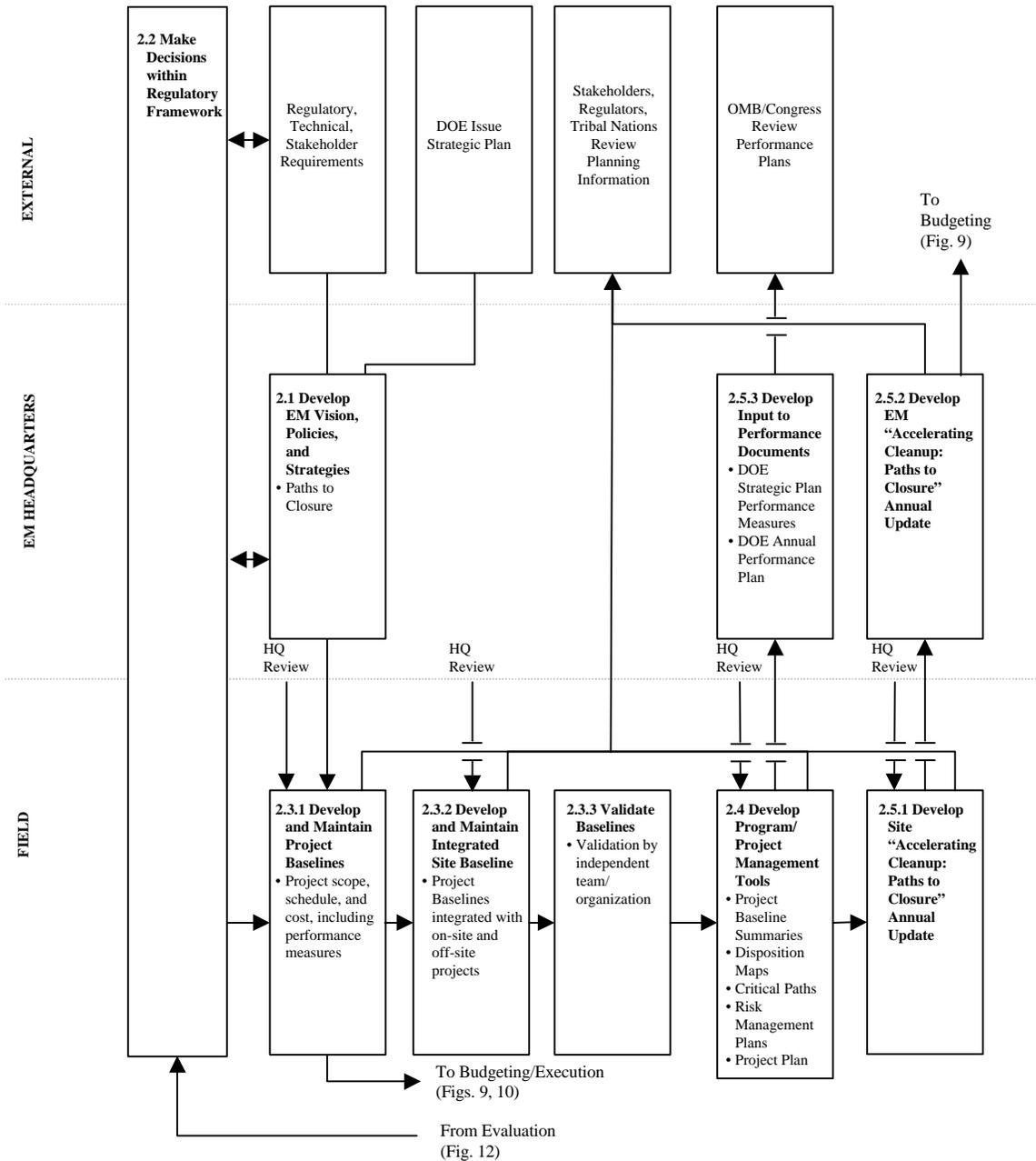


Figure 5. EM Planning Process

### 2.1 EM VISION, POLICIES, AND STRATEGIES

The Environmental Quality business portion of the DOE Strategic Plan and Accelerating Cleanup drives planning in the EM Program: *Paths to Closure*. *Paths to Closure* provides the overall program blueprint for completing the cleanup of contaminated soil, groundwater, and facilities; treating, storing, and disposing of waste; and effectively managing nuclear materials and spent nuclear fuel. *Paths to Closure* is a management tool that reflects the individual sites best

judgment of what can be accomplished, assuming a constant outyear funding level, over time. *Paths to Closure* conveys the EM Vision, which states—

By 2006, the Environmental Management program intends to complete cleanup at most of its 53 remaining sites. At the 10 remaining sites, including our five largest sites, treatment will continue for the few remaining “legacy” waste streams. This vision will drive budget decisions, the sequencing of projects, and the actions needed to meet program objectives. This vision will be implemented in collaboration with stakeholders, regulators, and Tribal Nations.

Achievement of this vision will be guided by the following principles:

- Protect human health and safety and the environment
- Eliminate the most urgent risks
- Maintain compliance
- Reduce mortgage and support costs to free up funds for further risk reduction
- Reduce generation of wastes
- Create a collaborative relationship between DOE regulators, stakeholders, and Tribal Nations
- Focus science and technology development on filling technology gaps and cost and risk reduction
- Integrate waste treatment and disposal across sites.

*Paths to Closure* and the EM Vision are implemented through the use of project baselines to show how individual EM Projects contribute to overall completion of site cleanup. This Project-based planning approach keeps the planning focus on the ultimate project end point/end state. EM Headquarters will establish the policies and programmatic strategies to meet the EM Vision and *Paths to Closure*, while the Field is responsible for incorporating the EM Vision, policies, strategies, and *Paths to Closure* into its planning, budgeting, execution, and evaluation activities.

## **2.2 EM DECISION-MAKING PROCESS**

Decisions in the EM Program relative to program scope and schedule are driven by various statutory mandates, most notably the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). Most decisions are made at the site level (with appropriate Headquarters oversight). Other decisions are made at the Headquarters level because of their complex wide implications. In many cases, ultimate decision-making authority, in the sense of final approval authority, resides with EPA or state regulators. Public participation is an important element of the EM program’s decision-making process. The National Environmental Policy Act (NEPA) requires federal agencies to consider the environmental impact of their proposed actions. NEPA also requires that the public be informed of, and have an opportunity to comment on, major federal actions significantly affecting the environment. Consistent with its obligations under NEPA, the EM program performs an appropriate level of environmental review in conjunction with its projects, with

opportunities for public involvement. For projects managed under CERCLA, EM relies on the CERCLA process to incorporate NEPA values.

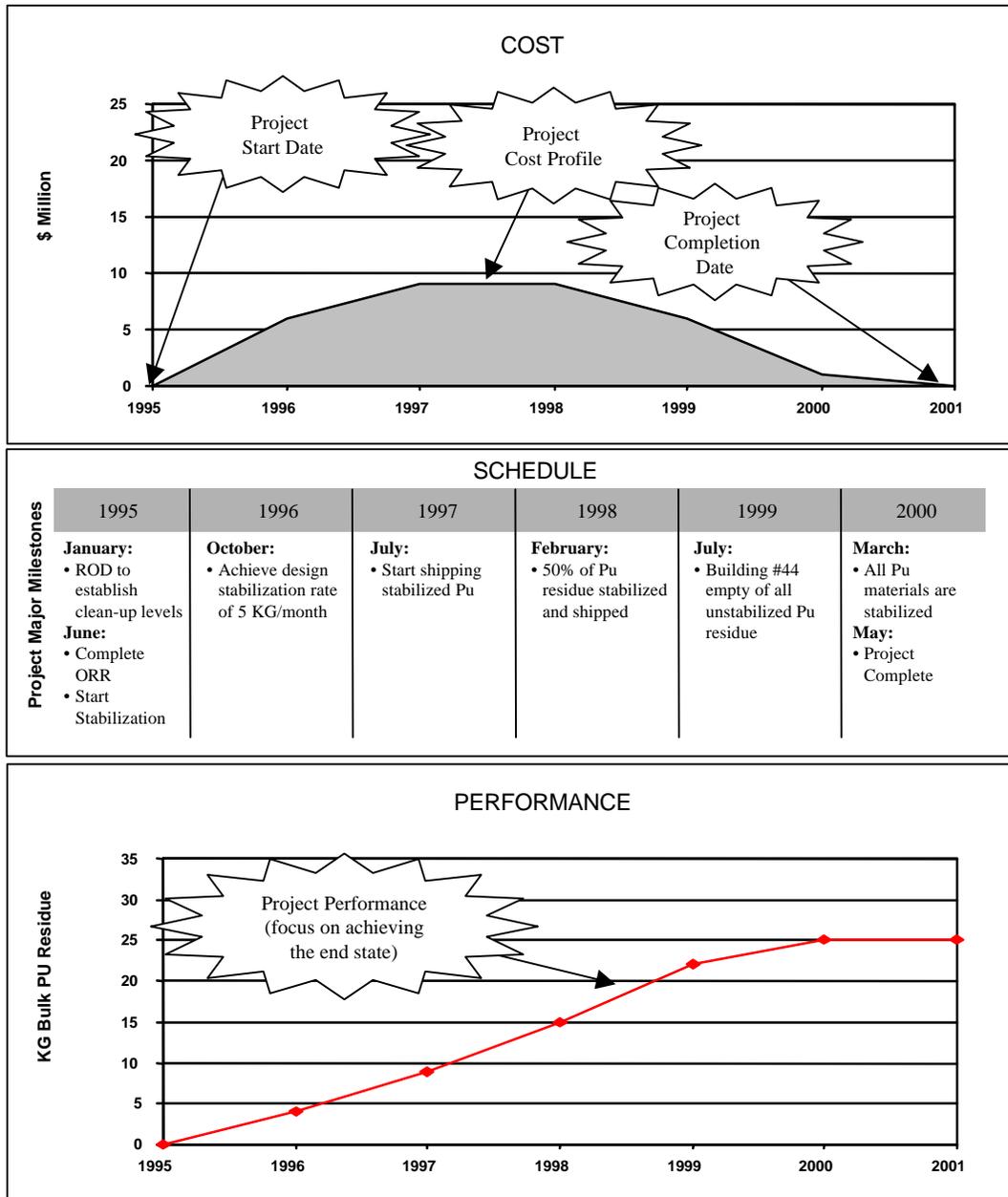
EPA or state environmental regulators are the final decision-makers for cleanup work conducted under CERCLA or RCRA because of their regulatory approval roles. At the site level, the EM Program negotiates with state and Federal regulators regarding the scope and schedule for conducting the studies, confers with the regulators on the recommended course of action, and negotiates with the regulators on the scope and schedule for implementing and monitoring the actions once decisions are finalized. The EM Program's role is to comply with schedules negotiated with state and Federal regulators for conducting studies, propose recommended courses of action, and implement the actions when the regulators have made decisions.

## **2.3 BASELINES**

Baselines define the planned scope, schedule, and cost for each EM Project and provide a basis for managing the project and measuring performance. Baselines also describe the current estimate of the scope, schedule, and costs for each site to complete the cleanup program. The baseline includes projects for which key site cleanup decisions have been made pursuant to CERCLA, RCRA, or other statutes and projects where such decisions have yet to be made. Where decisions have not yet been made, sites make assumptions about how those cleanup actions might be carried out so that sites can define work and develop schedule and cost estimates. Defensible EM Project baselines provide the foundation for IPABS. Sound baselines support the preparation of defensible budgets, development of meaningful performance measures and contract incentives, establishment of accountability, as well as provide a basis for controlling scope and cost growth. Baselines are developed at the EM Project level and are integrated with related on-site and off-site EM Projects to form the Integrated Site Baseline.

### **2.3.1 Project Baselines**

Baselines shall be developed for each EM Project. An EM Project baseline is a quantitative expression of the project scope, schedule, and cost requirements against which the status of resources and progress can be measured. The project baseline is typically maintained by the Field as a collection of documents, cost-loaded schedule networks, cost estimates, and documented assumptions. The Field will develop the specific content of EM Project baselines. Appendix G provides uniform expectations for the format of EM Project baselines. The scope, schedule, and cost components of the project baseline should be consistent with one another. Figure 6 illustrates the consistency among cost, schedule, and performance targets for an example project baseline.



**Figure 6. Consistency Among Performance Targets, Schedule, and Cost**

For planning purposes, project baselines should reflect full regulatory compliance and should be based on reasonable outyear funding assumptions. The degree of baseline detail should be consistent with the phase of the project and should adopt the “rolling wave” approach, such as, greatest level of detail for near-term (fiscal year plus 2 years) activities.

Performance measures and key milestones should be defined as part of the baseline. The Field Project Manager, with the assistance of the contractor, defines the major performance metrics required for management and control of the project. EM Corporate Performance Measures,

along with performance measures required by the contractor to implement the contractor's management system, should be incorporated into project baseline documentation.

Project baselines should remain stable through minor funding changes. If funding changes cause an impact to the project baseline that exceeds Field project baseline change control thresholds, the baseline should be changed through the Field baseline change control process.

Field Project Managers are responsible for developing and maintaining project baselines.

Headquarters PBS Leads will review EM Project baselines as part of the Integrated Site Baseline review discussed in Section 2.3.2. Headquarters Site Leads have the option of identifying major project milestones, such as site critical path milestones, that will be subject to baseline change control by Headquarters. Project baselines that support the Initial *Paths to Closure* document issued in June 1998 will be considered as "approved for use" baselines by EM Headquarters. This means that the scope, schedule, and cost of the EM Program as presented in *Paths to Closure* will reflect the "approved for use" baseline. These baselines represented the EM strategy based on the assumptions in the initial Paths to Closure. These baselines will be subject to baseline change control by the Field, with Headquarters involvement if thresholds are exceeded (see Chapter 4). Formal baseline approval by the Field and EM Headquarters occurs after the Headquarters baseline review and independent baseline validation by the Field.

Headquarters will approve, at a minimum, the end state, end date, project cost, and major project milestones for each EM Project. Headquarters can approve lower-level baseline information, as agreed to between the Headquarters Site Lead and the Field.

### 2.3.2 Integrated Site Baselines

Individual project baselines should be integrated using systems engineering principles with other associated on-site and off-site EM Projects to verify the integrated site baseline. In general terms, the integrated site baseline is a high-level summary of the project baselines with documented identification of interfaces and constraints between related on-site and off-site projects. If integration issues exist, they are identified and resolved; and the project baselines are revised through baseline change control. All EM work performed at a site, including nuclear materials stabilization, facility deactivation, facility decommissioning, environmental restoration, waste management, science and technology development, and landlord-infrastructure should be included in the integrated site baseline. EM Projects may also be integrated with non-EM Projects for site management efficiencies. This integration should occur at the geographic site level to allow the Field Project Managers to understand how their projects interact with available EM and site resources and with other projects. Integrated site baselines should meet compliance requirements, incorporate sequencing of projects to achieve maximum mortgage reduction (minimization of fixed costs), and include constraints in interactions with other sites. The integrated site baseline will contribute to the site *Accelerating Cleanup: Paths to Closure* and for the baseline-related program management tools described in Section 2.4. The Field is responsible for developing and maintaining the integrated site baseline. The Headquarters Site Lead will support identification of cross-site integration requirements.

Headquarters will conduct a review of the Integrated Site Baseline (including review of EM Project baselines) as determined by the Headquarters Site Lead. Factors such as the extent of baseline changes due to new regulatory documents, assumption changes, development of more-

detailed planning, and the rigor of the field change control process will determine the frequency of this review. This review will focus on the baseline scope and will address both the project baseline documentation and the baseline-related planning tools (Project Baseline Summaries, Disposition Maps, Site Critical Paths, and Programmatic Risk Management Plans) that are each further discussed in Section 2.4. The review will address the following elements at the site level or for selected EM Projects:

- Programmatic assumptions
- Review of EM Project baseline documentation against the baseline attributes in Appendix G
- Consistency of project baselines with EM Vision and *Paths to Closure*
- Integration of EM Projects with related on-site and off-site EM Projects
- Site Critical Path
- Disposition Maps
- Programmatic risk rankings and Programmatic Risk Management Plans
- Technical approach in project baselines
- Accuracy of PBSs as a summary of the EM Project baselines
- Relationship of Site WBS to EM Project structure
- Other elements as determined by the HQ Site Lead.

The outcomes of the baseline review must be discussed, negotiated, and then incorporated into the project baseline through the change control process as applicable.

### **2.3.3 Baseline Validation**

Once a site develops its integrated baseline, the site is responsible for ensuring that the site baseline is independently validated to prove that it is defensible relative to scope, schedule, and cost. A credible and independent validation of each site's baseline is an expectation of Congress, OMB, local stakeholders, Tribal Nations, and EM. Baseline validation is a one-time event. Once a baseline is validated, it should not require revalidation if changes are managed through a rigorous change control process. Completion of a rigorous independent validation should reduce the need to subject the site to additional resource-consuming audits and reviews by other organizations.

The Field will select the validation organizational team with the concurrence of the Headquarters Site Lead. A team or organization that is clearly independent of the business implications of the validation results will conduct independent baseline validation. For example, Headquarters Site Team members or Operations Office staff should not participate in the independent validation for their sites, although they may participate as observers. The validation team or organization should not have contributed to the development of the baseline or project planning documents nor should it experience any positive or negative effects from the validation finding. Independent

baseline validation will focus on the reasonableness and validity of the baseline cost and schedule by using appropriate estimating techniques and comparisons to benchmark costs where applicable. The outcomes of the validation must be discussed, negotiated, and then incorporated into the project baseline through the change control process.

## **2.4 PROGRAM/PROJECT MANAGEMENT AND PLANNING TOOLS**

EM maintains summary level information on all EM Projects and the integrated site baseline through a series of program/project management and planning tools, including PBSs, Disposition Maps, Site Critical Paths, and Programmatic Risk Management Plans. Together, these tools enable EM to plan, budget, execute, and evaluate work more effectively. They also allow EM to focus management attention on EM Projects critical to the completion of the cleanup mission and direct technology development efforts to support those critical projects. Because life-cycle planning information in these tools is updated by the Field annually and provided to Headquarters for review, Headquarters should work collaboratively with the Field between these updates to improve the overall quality of site-specific planning and to improve national integration. The following sections describe these tools.

### **2.4.1 Project Baseline Summary**

As discussed in Section 1.2.2, PBSs are developed for each EM Project to summarize project information related to planning, budgeting, execution, and evaluation. In the spring of each year, the life-cycle baseline information in the PBSs should be updated to be consistent with the project baseline. The life-cycle baseline information in the PBS must include specific data fields subject to baseline change control at the Headquarters level. These Fields include the end state narrative, the end date milestone, the project life-cycle cost, any milestones identified by Headquarters for Headquarters baseline change control, and milestones that establish interfaces with off-site EM Projects. The life-cycle baseline information in the PBS must also include additional scope, schedule, cost, and performance measures information that summarizes the project baseline, but is not explicitly subject to baseline change control at the Headquarters level.

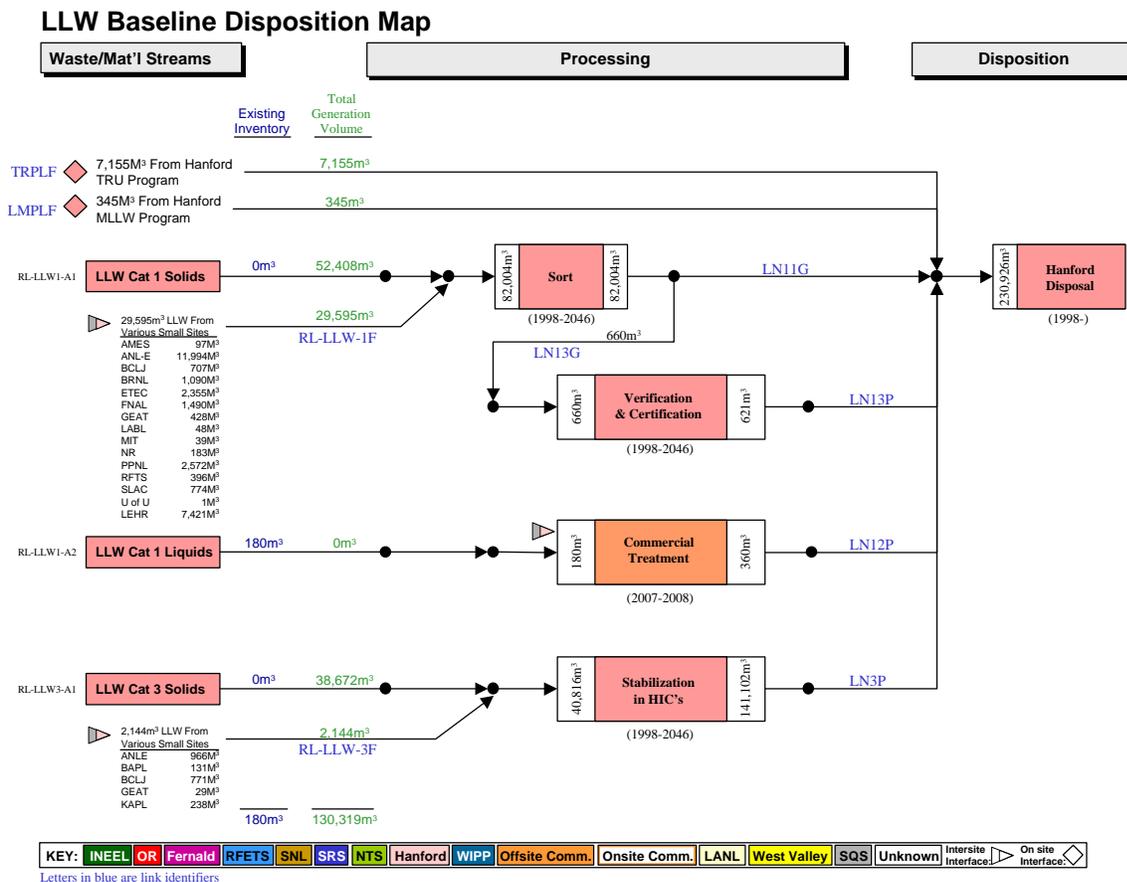
The Field is responsible for updating life-cycle baseline information in the PBS annually as required to ensure consistency with project baselines. After each annual update, Headquarters PBS Leads will review the life-cycle baseline information in the PBS to ensure planning is consistent with EM policies and strategies, to identify potential baseline improvements (such as program integration and reduction in overall project costs) to be discussed with the sites, to evaluate end state consistency with stakeholder expectations, and to evaluate cross-site consistency between end state, technical approach, and cost for similar project types.

### **2.4.2 Disposition Maps**

Disposition Maps are graphical representations of a site's conceptual approach for managing wastes, nuclear materials, and contaminated media from generation through disposal. These maps provide local and national stakeholders, regulators, and Tribal Nations a clear understanding of waste and materials disposition paths. In cases where decisions have not been

made, these maps indicate “to be determined” or planning assumptions to enable more meaningful stakeholder participation in national planning efforts.

Disposition Maps should be developed using a systems engineering process and should be consistent with EM Project baselines and signed decision documents. Disposition Maps show aggregate “waste or material streams” that are of similar makeup and have a similar disposition path at a level established by the Field. Each waste stream, or flow, on a map represents the underlying “stream disposition” information (including annual quantities) reported by the Field in the EM Corporate Database. The specific EM Projects associated with each map stream and disposition activity should be identified to provide the necessary correlation between annual quantity measures and other project information. It is expected that Disposition Maps will evolve and improve each year as EM collects additional characterization information, resolves “to be determined” dispositions, and incorporates stakeholder and regulatory decision document input. Disposition Maps, together with Site Critical Paths and PBSs, can be used to assess the potential for cross-site opportunities. Figure 7 shows an example Disposition Map.



**Figure 7. Example Disposition Map**

All sites are required to have Disposition Maps covering all EM-managed waste, nuclear material, or contaminated media at a site; and the Field is responsible for providing appropriate input into the EM Corporate Database. Disposition Maps will be produced from tools linked directly to the Corporate Database. Headquarters PBS Leads will review Disposition Maps to—

- Determine whether quantities are consistent with what is generally known about the site, address known gaps, and verify assumptions
- Evaluate consistency between sites addressing similar streams
- Identify inter-site transfers and facilitate opportunities for inter-site transfers where this is a benefit to the program
- Improve overall efficiency of disposition activities, by taking actions such as eliminating redundancy, establishing efficient contracting practices, and applying lessons learned from similar projects
- Evaluate Science and Technology investments, technological and other risks, and Science and Technology Coordination Group needs with specific site waste streams
- Determine credibility of waste reduction claims from pollution prevention measures

### **2.4.3 Site Critical Path**

EM uses the Site Critical Path as a tool to focus project management efforts on achieving site cleanup and closure and to evaluate and take action to reduce programmatic risk. This tool shows the schedule for the major activities associated with each EM Project, major project interfaces (both within and between sites), major decisions, and the overall critical path for site closure or completion of cleanup activities at the site. The Site Critical Path is the series of activities or projects that determine the earliest completion for cleanup activities at a site. Delay in a critical path activity will delay site closure; similarly, acceleration of the site completion date can occur only if acceleration occurs with critical path activities. The critical path should also identify programmatic risk rankings associated with individual EM Projects, milestones, or activities on the critical path. The Site Critical Path will be built up from the critical paths for the individual EM Projects at the site and will be consistent with the integrated site baseline. The Field is responsible for developing and providing to the Lead Site DAS an annual update to the Critical Path for each geographic site. Critical Paths should be consistent with critical activities, events, and milestones provided in the spring update. Headquarters Site Leads will review the Site Critical Paths to identify actions to both maintain and potentially accelerate site cleanup or closure and to ensure that off-site interfaces are identified. Figure 8 is an example Site Critical Path.

### **2.4.4 Programmatic Risk Management Plans**

Programmatic Risk Management Plans are tools that identify key issues, risks, and uncertainties, as well as the approach for managing or mitigating those risks and uncertainties. Programmatic risk management focuses management attention on potential growth in project cost, schedule, and scope from uncertainties in technology, work scope definition (characterization and end state definition), and inter-site dependencies. Because a significant number of such uncertainties exist in the EM Program, programmatic risk management is needed to identify and significantly minimize unexpected cost growth and schedule delays.

In implementing programmatic risk management, sites should provide programmatic risk values for each critical path activity and waste stream. Appendix H provides criteria for ranking programmatic risks from low (1) to high (5). For high programmatic risk values (4 or 5), sites should develop Programmatic Risk Management Plans that describe the specific risk, provide a path for managing the risk (including contingencies, as appropriate), and provide a schedule for risk mitigation activities. The Field should develop Programmatic Risk Management Plans at whatever level (i.e., milestone, EM Project, treatment/disposal system, or site) is most appropriate to addressing the risk. In the case of technological risk, the Field should develop Science and Technology project-level roadmaps. Headquarters will provide funding as a top priority for Science and Technology investments outlined in project level roadmaps. Programmatic Risk Management Plans should be provided to the Lead Site DAS. Headquarters Site Leads should evaluate the appropriateness of risk scores based on what is known about each project and review the Programmatic Risk Management Plans to identify any additional potential actions to minimize or mitigate programmatic risk.

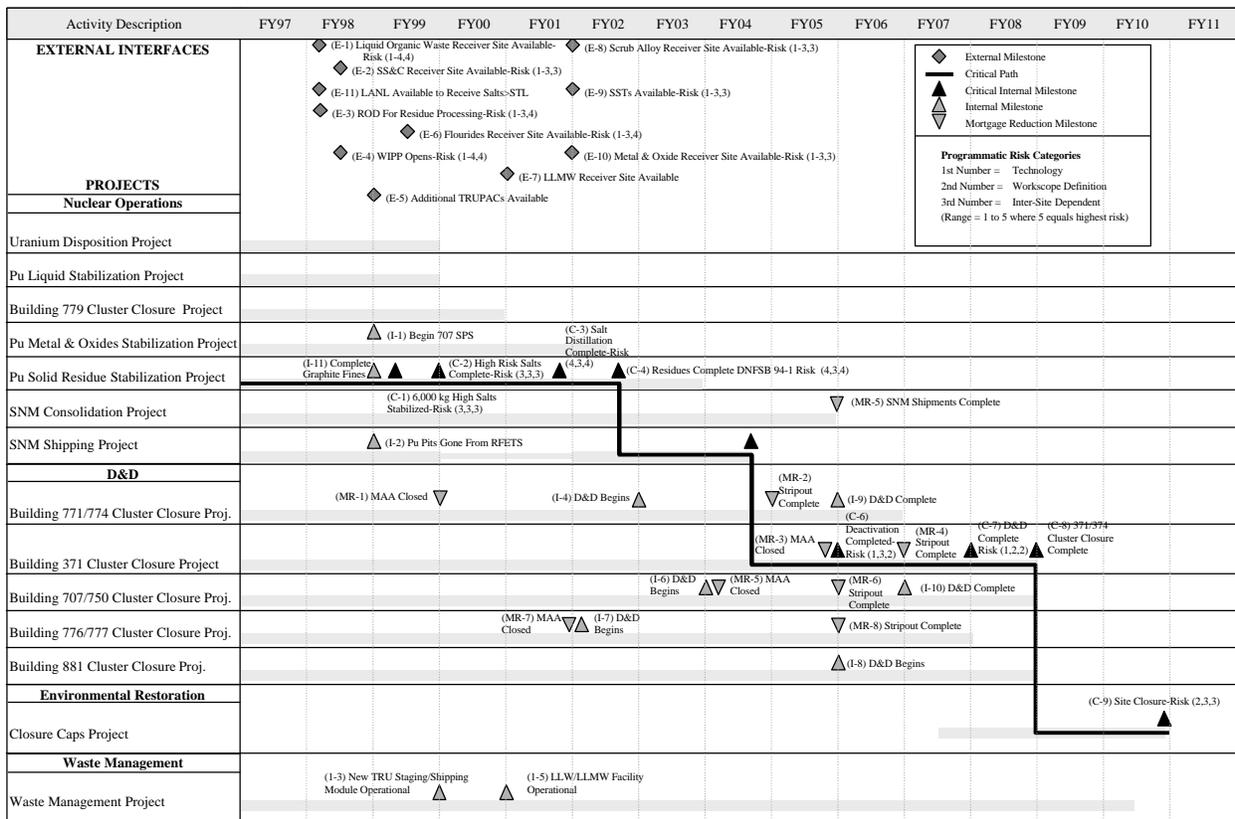


Figure 8. Example Site Critical Path

### 2.4.5 Project Plans

The project plan is a summary of all necessary information and documentation to properly plan and execute the project, to support Headquarters oversight activities, and to communicate with stakeholders and regulators. The field offices/elements will develop project plans for EM

projects based on a graded approach as appropriate and as negotiated with Headquarters. Many of the elements of the project plan are discussed elsewhere in this handbook. The project plan should include the following:

1. Mission Need Justification/Project Objectives
2. Project Description and Complexity Assessment
3. Detailed organizational structure, roles, responsibilities, and authorities including decision authority for Headquarters and Field Element program and project management and support functions such as health physics, safety, NEPA documentation, etc.
4. Resource requirements, including funding request documentation to be submitted into the congressional budget (Reference PBS–Section 2.4.1 of Handbook)
5. Project cost, schedule, and technical baseline (including contingencies), baseline change control thresholds, and description of Level 0, 1, and 2 change control elements as applicable (Reference PBS–Section 2.4.1 of Handbook)
6. Risk management plan–includes risk management for all major milestones with high programmatic risk (Reference Programmatic Risk Management Plan–Section 2.4.4 of Handbook)
7. Project controls system and reporting requirements–include work breakdown structure, funds management, variance analysis, project shut-down criteria, etc.

Over the course of the project, the project plan shall be updated to include as applicable, or through reference:

1. ES&H documentation, readiness review, etc.
2. NEPA documentation to be completed prior to final commitment to an alternative
3. Safeguard and security documentation
4. Integrated Safety Management System (ISMS) documentation
5. Quality assurance and configuration management planning documentation
6. Transition and close out documentation
7. Acquisition Strategy
8. Integrated site schedule with other EM projects (i.e., Master Schedule/Site Critical Path) (Reference Site Critical Path–Section 2.4.3 of Handbook)

The project plan is a single document, which provides the required information either by providing reference to other existing documents or writing the information in this document as applicable to projects. Therefore, a project plan can be a two-page document or a detailed large size document, based on graded approach and other existing documentation.

## **2.5 PROGRAM PLANNING DOCUMENTS**

Using the baseline summary information contained in the program/project planning tools discussed in the previous sections, EM will prepare documents that reflect current EM planning, including the Site *Paths to Closure* Annual Update, the EM *Paths to Closure* Annual Update,

EM's input to the DOE Annual Financial Statement, and Performance Plans. These documents are used to inform stakeholders, regulators, Tribal Nations, OMB, and Congress about overall EM plans.

### **2.5.1 Site Accelerating Cleanup: Paths to Closure Annual Update**

The Site *Paths to Closure* provides a blueprint for the EM cleanup program at each site and is a management tool that reflects the site's best judgement of what can be accomplished. The annual updates of the Site *Paths to Closure* must be developed, consistent with the latest approved project baselines, the life-cycle baseline information in the PBSs, annual Disposition Map updates, and Site Critical Path updates. *Paths to Closure* must have a defined relationship to information presented in the budget. *Paths to Closure* will be consistent with (but not necessarily identical to) the prior year, current year, and planning year information presented in the most recent Congressional Budget Request. EM will use *Paths to Closure* to formulate annual budget strategies in the context of life-cycle cleanup costs and schedules. Site *Paths to Closure* should address the topics contained in the Life-cycle Planning and Budget Guidance. The Site *Paths to Closure* will be developed by the Field and reviewed by the Lead Site DAS.

### **2.5.2 EM Accelerating Cleanup: Paths to Closure Annual Update**

The EM *Accelerating Cleanup: Paths to Closure*, like the Site *Accelerating Cleanup: Paths to Closure* provides a blueprint for the EM cleanup program at each site and is a management tool that reflects EM's best judgement as to what can be accomplished. The EM *Paths to Closure* provides the integration and the national perspective not available in Site *Paths to Closure* documents. The information in the EM *Paths to Closure* must be consistent with the Site *Paths to Closure* and associated PBSs. EM will also use *Paths to Closure* to manage its cleanup program, including evaluating progress against performance metrics and project baselines. The EM *Paths to Closure* will be updated annually and will be prepared by EM Headquarters and provided to the Field for review and concurrence on the site-specific portion of the document.

### **2.5.3 Performance Plans**

Performance Plans provide a basis for measuring performance in meeting the EM Vision, goals, and objectives. Based on the planned performance measures for each EM Project, EM provides input for the following DOE planning documents required by GPRA:

**DOE Strategic Plan.** Outlines the goals, objectives, strategies, and success measures for DOE's major functions and operations. EM has overall responsibility for the Environmental Quality section of the DOE Strategic Plan.

**DOE Annual Performance Plan.** Includes EM's Corporate Performance Measures and goals for the fiscal year budget request for key departmental activities. The Annual Performance Plan is submitted, along with the budget, to OMB in the fall and is finalized when the budget is transmitted to Congress in early February. EM's section of the Department's plan will include key EM performance measures and associated fiscal year goals. The performance goals reported

in the plan will be consistent with the data reported in the Congressional Budget Request, in accordance with GPRA requirements.

EM input to DOE performance plans will be prepared by EM Headquarters based on performance measure goals reported by the Field. Fiscal year goals will be established for all EM performance measures. Headquarters will work with the Field to ensure that the performance goals are accurate, complete, and challenging. Performance measures information is also used for the execution year management commitments discussed in Section 4.2 of this handbook.