ORNL/ER-167

**Energy Systems Environmental Restoration Program
ORNL Environmental Restoration Program**

**Program Management Plan for the Martin Marietta
Energy Systems, Inc., Oak Ridge National Laboratory
Site Environmental Restoration Program**

Date Issued—July 1994

**Prepared by
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Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831-6285**

**managed by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400**

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Site Environmental Restoration Program**

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ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U. S. Department of Energy
DOE-ORO	DOE Oak Ridge Operations Office
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
ES&H	environmental, safety, and health
FFA	Federal Facility Agreement
FIOS	Field Interface and Oversight Section
MCS	Management Control System
NEPA	National Environmental Policy Act
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation
WAG	waste area grouping
WBS	work breakdown structure
WMRAD	Waste Management and Remedial Action Division

EXECUTIVE SUMMARY

This program management plan describes the scope, objectives, and method of accomplishment for the Martin Marietta Energy Systems, Inc. (Energy Systems) Oak Ridge National Laboratory (ORNL) Environmental Restoration (ER) Program. The ORNL ER Program is one of five site programs receiving guidance from and reporting to the Energy Systems ER Division. Therefore, all ORNL ER policies and procedures are consistent with ER Division policies and procedures. This plan covers all ORNL ER activities, the participants involved in these activities (and their roles and responsibilities), and all phases of the remediation process. This plan will also serve as a template that may be supplemented as necessary to provide individual project management plans for specific projects.

This document explains how the Energy Systems ORNL ER Program does business, so the ORNL ER Program's management structure is illustrated in detail. Personnel are assigned to the ER Program from other organizations to assist with specific projects. This plan identifies positions at the program level and discusses responsibilities and interactions with positions at the project level.

This plan includes sections that describe requirements for project plans, work breakdown structures, schedules, project management and cost control systems, and information and reporting. Project management plans will utilize the work breakdown structure and dictionary pages in the appropriate life cycle baseline report. This plan describes the information that should be contained in ORNL ER project management plans.

The most important milestones are primary documents relating to the management and remediation of contaminated sites. Primary document milestones are subject to stipulated penalties and receive paramount attention. These key milestones are shown in Table 1 (page 49) of this plan. The main measures of performance on ORNL ER Program projects, which will be prepared for U. S. Department of Energy review and approval, are (1) budgeted cost of work scheduled, (2) budgeted cost of work performed (or earned value), (3) actual cost of work performed, (4) estimate at completion (or current working estimate), (5) budget at completion, (6) schedule variance, and (7) cost variance. The Energy Systems ER Division develops performance indicators for the entire division.

Energy Systems typically receives data from other contractors which it integrates into the actual cost and schedule performance data for ORNL ER projects including (1) costs, milestones/schedule, and technical parameters, including baseline tracking data for each subproject; (2) a time-phased contractor cost plan that interfaces with the integrated installation cost plan; (3) for semiannual reviews -- all cost and schedule data through the cutoff date for the reporting period; current status of each subproject; overall accomplishments, problems, and potential problems at the summary subproject level; and a forecast of ultimate overall performance; (4) for the quarterly Federal Facility Agreement progress reports -- detailed statements identifying anticipated delays in the meeting time schedules, the reasons for the delays, and the actions taken to prevent or mitigate the delays.

1. INTRODUCTION

1.1 PURPOSE

U.S. Department of Energy (DOE) Order 4700.1 requires major system acquisitions, such as the Environmental Restoration (ER) Program at the Oak Ridge Reservation (ORR), to have a project management plan. In response to this requirement, the Environmental Restoration Division of the Department of Energy — Oak Ridge Operations Office (DOE-ORO) prepared the Oak Ridge Operations Environmental Restoration Program Management Plan (DOE-ORO 1991) and the Site Management Plan for the Environmental Restoration Program (DOE-ORO 1992a). Martin Marietta Energy Systems, Inc. (Energy Systems), the managing and operating contractor for the ORR, is currently preparing a division-level program management plan for the Energy Systems ER Division.

This program management plan for the Oak Ridge National Laboratory (ORNL) ER Program, delineates the major activities of the ER Program. This plan discusses the roles and responsibilities of the organizations that will perform the work and provides guidance for the preparation of specific project management plans. This program management plan also serves as a generic project management plan for activities conducted by the ORNL ER Program.

1.2 BACKGROUND

Energy Systems manages ORNL, a multipurpose research facility, for DOE. Since its construction in 1943, ORNL primarily has conducted research and development on uses of nuclear technologies. This research and development effort generated, as byproducts, a wide variety of solid and liquid radioactive wastes, as well as hazardous wastes and mixed wastes (radioactive and hazardous). These wastes came from radioisotope production, experimental reactors, hot cells, pilot plants, research and analytical laboratories, and accelerators. Most of these wastes were stored or disposed of on-site. In addition, from 1955 to 1963, ORNL served as the Southern Regional Burial Ground for the Atomic Energy Commission and received a large volume of solid radioactive waste from other sites. Consequently, ORNL has a legacy of contaminated and potentially contaminated facilities, research areas, and waste management areas that may require remediation. The most recent inventory of remediation sites [Federal Facility Agreement (FFA), 1992] of remediation sites has identified approximately 400 individual sites that will require investigation and possibly remediation.

In 1984, it was determined that DOE is subject to the general requirements of the Resource Conservation and Recovery Act (RCRA) and the 1984 Hazardous and Solid Waste Amendments to RCRA. Therefore, when the first RCRA permit was issued to DOE-ORO, the Hazardous and Solid Waste Amendments provisions were incorporated as required by Congress. These provisions required that releases or potential releases from all known and future solid waste management units, both on-site and off-site, would be investigated. The solid waste management units are approximately equivalent to the 400 or so remediation sites previously noted. Initial site characterization studies have shown the presence of area-wide groundwater and soil contamination that is not readily traceable to an individual remediation

site. Therefore, hydrogeologic characteristics and waste source information were used to group remediation sites into waste area groupings (WAGs) for better management of the ER projects. Because the shallow groundwater systems closely relate to the surface drainage systems in the ORNL area, the remediation sites were grouped into WAGs based on observable surface drainage characteristics. While some WAGs may share boundaries, each WAG comprises a distinct small drainage area into which similar contaminants were introduced. Watersheds that contain contiguous and similar assemblages of operating facilities and remediation sites generally define the WAGs (Trabalka and Myrick 1992).

The WAG concept allows perimeter groundwater and surface water monitoring for each hydrologic unit, or WAG, in a time frame that is much shorter than that required to isolate and define each remediation site within the WAG. Based upon the WAG perimeter monitoring, further studies can address individual remediation sites within a WAG or contaminant plumes leaving the WAG. Individual projects within the ORNL ER Program can be at the WAG level, operable unit level, or lower.

In 1985 ORNL established the Remedial Action Program to remediate the past reactor waste and other research waste contamination based on DOE orders pertaining to the management of surplus facilities (DOE Order 5820.2), compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), (DOE Order 5480.4A), and implementation of the National Environmental Policy Act (NEPA), (DOE Order 5440.1C). Where DOE remedial actions under CERCLA trigger the procedures set forth in NEPA, DOE integrates the procedural and documentation requirements of CERCLA and NEPA, wherever practical. The primary instrument for this integration will be the remedial investigation/feasibility study process. Approval levels for remedial investigation/feasibility study-NEPA documents are intended to parallel those approvals required for NEPA documents in DOE 5440.1C.

When the ORR was placed on the National Priority List on November 21, 1989, the regulatory driver for the ORR shifted from RCRA to CERCLA. Sections of RCRA became applicable or relevant and appropriate requirements (ARARs) for managing some ER projects on the ORR. The Remedial Action Program at ORNL was merged with those at the Oak Ridge Y-12 Plant, the Oak Ridge K-25 Plant, the Paducah Gaseous Diffusion Plant, and the Portsmouth Gaseous Diffusion Plant into a new, comprehensive ER Division. The ORNL ER Program is one of five site offices reporting to the Energy Systems ER Division.

An FFA was negotiated with the Tennessee Department of the Environment and Conservation (TDEC) and the U. S. Environmental Protection Agency (EPA) to establish responsibilities, roles, approval processes, and schedules for implementation of CERCLA on the ORR. The FFA for the ORR was finalized in December 1991, became effective in January 1992, and annually specifies the list of deliverables for the ER work at ORNL.

1.3 THE CERCLA PROCESS

The CERCLA process is shown in Fig. 1. The first phase in the CERCLA process is preliminary assessment/site investigation. Candidate sites that may be contaminated are identified and screened in this phase. Many sites can be eliminated from further characterization based on evidence that these sites are managed to acceptable levels of environmental contamination or human health risks.

93-022-MIS

Fig. 1. The CERCLA Process.

Sites that are not eliminated during the preliminary assessment/site investigation phase require more intensive site characterization. The next phase in the CERCLA process is the remedial investigation, followed by the feasibility study phase. The remedial investigation defines the nature and extent of contamination, and the feasibility study evaluates remedial alternatives. Sometimes these two phases may be carried out simultaneously. Technology development and treatability studies are often performed as part of the remedial investigation/feasibility study phase.

The next phase in the CERCLA process is the proposed plan/record of decision. The proposed plan recommends an action to the public for review, and the record of decision finalizes the decision. The record of decision phase is followed by the remedial design and remedial action phases, sequentially. Under CERCLA, the remedial action must commence within 15 months of the approval of the record of decision. Removal actions can be performed at any time during the process. A removal action is a temporary or interim measure taken to abate further contaminant migration within the overall remediation activities. The documentation requirements for each type of removal and remedial action are contained in Fig. 2.

Following the remedial action phase, verification that the remedial action was conducted in accordance with the record of decision and remedial design may be required. This is not required by CERCLA. Surveillance and maintenance are performed before, during, and after the CERCLA process on remediation sites. Surveillance and maintenance ensures that the remediation site continues to pose no significant risk to human health or to the environment.

1.4 THE RCRA PROCESS

The RCRA process contains the following five phases: facility assessment, facility investigation, corrective measures study, corrective measures, and postclosure monitoring.

The RCRA process parallels the CERCLA process. The RCRA facility assessment phase is equivalent to the preliminary assessment/site investigation phase of CERCLA. The next step in the RCRA process is the RCRA facility investigation, which contains most of the same components as the remedial investigation phase of CERCLA. The RCRA corrective measures study, which follows the facility investigation phase, combines the work of two CERCLA phases: the feasibility study and the record of decision. Next, the RCRA corrective measures phase is equivalent to the remedial design and remedial action phases of CERCLA. RCRA concludes a site remediation with postclosure monitoring; CERCLA has an equivalent postconstruction requirement for surveillance and maintenance.

1.5 SCOPE

The mission of the DOE-ORO ER Program is to reduce to prescribed safe levels the risks to the environment and human health posed by inactive and surplus DOE-ORO-managed sites and facilities that have been contaminated with radioactive, hazardous, or mixed wastes. The FFA has assigned approximately 400 contamination or release sites to ORNL ER Program for remediation. Additional sites may be added to the ORNL ER Program jurisdiction as a result of site identification or other efforts. This program management plan

Fig. 2. Removal and remedial action document hierarchy under CERCLA.

will cover all activities and phases necessary to implement the ORNL ER Program. These activities include site identification, preliminary assessment/site investigation, remedial investigation, feasibility study, proposed plan/record of decision, remedial design, remedial action, technology development, verification, and surveillance and maintenance — for all program participants.

The CERCLA process requires that several alternatives be defined. The additional definition, planning, and analysis activities will help to mitigate schedule slip inherent in the design and/or construction breakage. Project participants will have a readily available, well-defined, planned alternative for achieving project goals. The revised approach to meeting the project objectives will already be familiar to the EPA, in principle, as a possible alternative.

As with other engineering projects conducted for DOE, the ORNL ER Program is required to prepare cost estimates for baselines and other government estimate purposes, performance plans, progress reports, financial reports, performance baselines, prioritization lists, and change control documents. Once remediation is completed at a site, the ER program will monitor the effectiveness of the remedial action. The ER Division will provide advice to DOE and Energy Systems management on land use for CERCLA and RCRA sites.

1.6 PRIMARY PARTICIPANTS

The support organizational structure for the ORNL ER Program is shown in Fig. 3. DOE-ORO ER Division will furnish overall program management, provide all necessary approvals, interface with EPA and TDEC, oversee Energy Systems activities as the ER Program Integrating Contractor, and administer the contract with the technical support contractor. The Environmental Restoration division manager is the DOE-ORO official responsible for these administrative activities. The DOE-ORO Assistant Manager for Construction and Engineering, who administers the contracts with the remedial design contractor and the construction management contractor, will oversee design and construction work. DOE-ORO will also provide project support, as required, through the DOE/ORNL site office. The primary program participants are prime contractors of DOE-ORO and are responsible for the following activities.

- Energy Systems, as the management and operations contractor for ORNL, the Y-12 Plant, the K-25 Site, Paducah Gaseous Diffusion Plant, and Portsmouth Gaseous Diffusion Plant, has responsibility for facility management and for the integration of all ER work and participants on the sites. Energy Systems is the integrating contractor for the DOE-ORO ER Program at all five sites. Energy Systems is responsible for the preliminary assessment/site investigation, remedial investigation, technology development, and surveillance and maintenance phases. The roles and responsibilities of the ORNL ER Program are as follows.
 1. Performing preliminary assessments, site investigations, and remedial investigations for all remedial action sites at ORNL.
 2. Serving in the role of integrating contractor for all ER Program work and all contractors to ensure coordination and integration of all participants, accomplishment of scope, adherence to budget, and satisfaction of all milestones.

Fig. 3. Support organization for ORNL ER Program projects.

3. Planning for waste management; forecasting waste generation; forecasting treatment, storage, and disposal needs; informing the Energy Systems Waste Management Organization Central of these capacity needs for the ORNL ER Program; and implementing a pollution prevention program.
 4. Identifying technology development needs and working with the Energy Systems Center for Environmental Technology to develop and demonstrate technologies specific to ORNL remediation needs.
 5. Providing support to the DOE-ORO ER Division in maintaining a strong regulatory interface with appropriate state and federal regulatory agencies.
 6. Performing surveillance and maintenance activities on inactive sites and facilities.
 7. Conducting monitoring programs necessary to identify and prioritize contaminated sites and to measure the effectiveness of remedial actions.
 8. Providing advice to DOE and Energy Systems management on land use for CERCLA and RCRA sites.
 9. Providing guidance to other prime contractors on quality assurance (QA), quality control, and health and safety.
 10. Preparing cost estimates for baselines and other government estimate purposes, performance plans, progress reports, financial reports, performance baselines, prioritization lists, and change control documents.
 11. Directing the work of various technical experts, including subcontractors or other Energy Systems organizations, to perform assessments, investigations, site characterizations, and preparation of associated reports. (Project managers also issue reports prepared by other program participants for internal and external technical review, consolidate comments, and recommend DOE-ORO approval to issue reports to regulatory agencies.)
 12. Preparing project plans, such as project management plans, quality assurance plans, waste management plans, and health and safety plans, data management plans, and sampling and analysis plans.
 13. Representing the ER Program to the public, DOE-Headquarters, regulatory agencies, the news media, and other stakeholders. (ORNL ER Program coordinates work sessions with the regulators and participates in public meetings.)
- Jacobs Engineering is the technical support contractor for the ORNL ER Program. Jacobs Engineering prepares the feasibility study, the proposed plan, the record of decision, and NEPA documentation.
 - ENSERCH Environmental Services, Inc., is the principal architect-engineering firm for remedial design for the ORNL ER Program and provides Title III services and

independent verification of both construction activities and remediation requirements (final contaminant levels, etc.).

- MK-Ferguson Company of Oak Ridge is the construction manager for the ORNL ER Program.

The ORNL ER Program contractor relationships are depicted in Fig. 4. The functional responsibilities are presented in Fig. 5. The DOE-CRO ER Division provides programmatic direction and approves all work plans for the ORNL ER Program. While the DOE-ORO ER Division assigns tasks to the DOE-ORO prime contractors, the ORNL ER Program acts as integrating contractor and provides guidance and direction on procedures, standards, and protocols for quality, compliance with DOE orders, progress reporting, and site access. The ORNL ER Program reviews, monitors, and recommends acceptance of the work of the other DOE-ORO prime contractors. The other prime contractors submit their progress/status reports to the ORNL ER Program for consolidation into overall program reports.

1.7 INTERFACES

The ORNL ER Program interfaces with a number of organizations and programs. Some of the more important interfaces include the ER Program for other sites managed by Energy Systems, ORNL Waste Management and remedial action Division, ORNL Safety and Health, and ORNL Environmental Compliance.

The ER and Waste Management Finance Organization provides finance officers as required for the ER Program Division. It also provides advice and consultation on financial matters. Information Management provides editing, publication, document reproduction, and other related services. ORNL Waste Management and Remedial Action Division provides an overall interface for advice and information on treatment, storage, and disposal availability, both on-site and off-site. The ER Program Support Section of the Waste Management and Remedial Action Division provides facility management and surveillance and maintenance of ER sites.

Central Engineering Services matrixes a number of individuals to the ORNL ER Program to serve as program and project managers; this organization also provides a central scheduling and estimating coordination service. Central Engineering Services oversees the remedial design and remedial action, which involves use of two DOE prime contractors: ENSERCH Environmental Services and MK-Ferguson Company.

The ORNL Environmental Sciences Division and ORNL Energy Division matrix a number of individuals to serve as project managers and to provide technical expertise on environmental matters.

LEGEND

- ENERGY SYSTEMS
- JACOBS ENGINEERING
- MK FERGUSON
- DOE
- ENSERCH
- OTHER CONTRACTORS

Fig. 4. Relationship among Oak Ridge Reservation contractors.

Participants/ activities	PA	RI	FS	PP/ROD	RD	RA	RV	PCM ^a O&M
HQ-OER	I	I	I	A	I	I	I	I
DOE AMERWM	C	D	D	D	C	C	C	D
DOE Site	A	A	A	C	A	A	A	A
DOE AMCE	S	S	S	S	D	D/A	D/A	N.A.
TSC	I	R	P ^b	P	R	R	C	N.A.
RD-AE	N.A.	N.A.	S	I	P	S	C	N.A.
RA-CM	N.A.	N.A.	S	N.A.	R	P	I	N.A.
IVC	N.A.	N.A.	N.A.	R	C	R	P	S
ES-M&O/IC	P	P	C	C/S	S/R/A	C/S	C	P

^aDefines responsibilities for first 3 years. After the first 3 years, responsibility shifts to waste management activities.

^bNEPA documentation is the responsibility of the performing organization. It may include an Environmental Assessment, an Environmental Impact Statement, and/or a request for a Categorical Exclusion.

Project activities				Participants	
A	Approve	RI	Remedial Investigation	HQ-OER - DOE Headquarters, Office of Environmental Restoration	RA-Construction Manager - remedial action Contractor
C	Concur	FS	feasibility study	AMERWM - Assistant Manager for Environmental Restoration and Waste Management	IVC - Independent Verification Contractor (ENSERCH Services, Inc.)
D	Direct	IROD	Interim Record of Decision	DOE Site - DOE Site Offices and/or COP	ES - Energy Systems
I	Inform	RD	Remedial Design	AMCE - Assistant Manager for Construction and Engineering	M&O - Management and Operations
P	Perform	RA	remedial action	TSC - Technical Support Contractor (Jacobs Engineering, Inc.)	IC - Integrating Contractor
R	Review	RV	Remedial Verification	RD-AE - Remedial Design Architect Engineer or Contractor (ENSERCH Services, Inc.)	
S	Support	PCM	Postclosure Monitoring		
PA	Preliminary Assessment	O&M	Operation & Maintenance		

Fig. 5. Environmental Restoration projects functional responsibility matrix.

2. OBJECTIVES

2.1 PROGRAMMATIC OBJECTIVES

The Energy Systems ER Program supports the DOE-ORO ER Program mission to ensure that potential risks to human health and the environment, posed by DOE's past operations, are eliminated or reduced to safe levels. The ORNL ER Program conducts cost-effective and technically sound actions to mitigate contaminant releases, reduce risk, and restore the environment to prescribed quality levels. The program will provide rapid reductions in contaminant releases and will implement and verify final remediation for contaminated sites at ORNL. Through strategic planning and use of the technical resources at ORNL, rapid and innovative actions will be implemented. The major contaminant releases and their sources will be prioritized in a hierarchical fashion. Actions will be undertaken with the full participation of stakeholders. These actions will provide rapid and cost-effective achievement of mutually acceptable objectives for site remediation at ORNL.

The ORNL site contains large volumes and types of radiological and hazardous constituents and numerous pathways for exposure to contaminants. The ER Program needs a flexible approach to achieve cost effective and technically sound solutions to contaminant releases. A workable strategy must include the following objectives.

1. Maintain the health and safety of workers involved in the environmental restoration/remediation process as the top priority in planning and conducting actions.
2. Conduct investigations and take actions at ORNL that support the rapid reduction of risk to human health and the environment and that result in full compliance with environmental regulations. (Investigations should be focused on reducing the uncertainty surrounding site characteristics and the nature and extent of contamination so that final actions can be selected and implemented.)
3. Develop decision standards to provide qualitative and quantitative criteria for prioritizing sites, selecting removal or remedial actions, and determining when final actions are feasible and appropriate.
4. Integrate environmental restoration activities with ORNL facility decontamination and decommissioning plans, and with waste management capabilities such that other activities do not delay schedules for remedial action.
5. Develop, and apply innovative approaches that result in rapid, technically sound, and cost-effective remedial actions. (Remedial action schedules will be coupled with technology development efforts, as necessary.)

Remediation shall be conducted in accordance with state and federal laws and regulations, DOE procedures, and the FFA for the ORR. Generalized FFA objectives are as follows

1. Ensure that the environmental impacts associated with past and present activities at ORR are thoroughly investigated and that appropriate remedial action is taken as necessary to protect the public health and welfare and the environment.
2. Establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at the ORR in accordance with CERCLA, the National Contingency Plan, RCRA, NEPA, appropriate guidance and policy, and in accordance with Tennessee state law.
3. Prevent, mitigate, or abate releases or threatened releases of hazardous substances from low-level radioactive waste tank systems under the FFA before final remedial action at the ORR.
4. Facilitate cooperation, exchange of information, and participation of DOE, EPA, and the state environmental regulatory agency.
5. Minimize the duplication of investigative and analytical work and documentation and ensure the quality of data management.
6. Negotiate milestones each year based on the approved budget.
7. Ensure that remedial actions at the ORR will comply with applicable or relevant and appropriate requirements.
8. Expedite response actions with a minimum of delay.
9. Establish a basis for a determination that DOE has completed the Remedial Investigation/feasibility studies, Remedial Designs, and remedial actions at the ORR pursuant to CERCLA and applicable Tennessee state laws.
10. Integrate response actions under CERCLA and the FFA with corrective measures now being conducted under RCRA and applicable state laws.
11. Ensure that all releases of hazardous substances, pollutants, or contaminants defined by CERCLA and all releases of hazardous wastes or hazardous constituents as defined by RCRA are addressed so as to achieve a comprehensive remediation of the ORR.

Speed and flexibility are important in accomplishing remediation activities. The Data Quality Objectives process streamlined the investigation phases of CERCLA by defining data requirements and acceptable levels of decision errors before any data is collected. This allows some WAGs to assume a "fast track" remediation schedule, with certain steps in the CERCLA process being combined or accelerated. The typical remediation task may begin before all of the characteristics of the remediation site are defined. Hence, these tasks are subject to changes in scope or complexity during the remediation process. Therefore, the ORNL ER Program must have the ability to respond in a controlled but rapid manner to new data uncovered as the program progresses. ORNL ER Program activities will comply with a QA program that provides confidence that results are technically valid and legally defensible.

2.2 TECHNICAL OBJECTIVES

The technical objective for the ORNL ER Program is to conduct innovative, cost-efficient, technically sound actions to reduce risk to human health and the environment. Actions are prioritized based first on contributions to potential off-site risk and secondly on potential future on-site risk.

As part of the process of achieving technically sound solutions to environmental problems, the ORNL ER Program will comply with the requirements of CERCLA as implemented by the FFA, applicable sections of NEPA, and DOE orders. The guidance for achieving the technical objectives for a CERCLA project before the issuance of the Record of Decision is described in *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988). Activities after the record of decision will accord with the project specific remedial design work plan and remedial action work plan.

2.3 SCHEDULE OBJECTIVES

The schedule objectives for the ORNL ER Program are contained in the *Life Cycle Baseline Summaries for the Environmental Restoration Program* (ORNL 1993b) prepared for each WAG. Specific milestone dates are negotiated annually and are contained in the FFA.

2.4 COST OBJECTIVES

The cost objective for the ORNL ER Program is to obtain maximum technical effectiveness of the remediation at minimal cost. The Life Cycle Baseline Summaries contain initial budgetary cost estimates. These estimates will be updated as assumptions change and as projects are better defined.

Once the record of decision or action memorandum has defined a technical solution, a preliminary cost estimate as defined in the DOE-ORO ER program management plan (DOE-ORO 1991) will be developed. A detailed estimate for remediation will be prepared when a definitive design is completed.

3. ORNL ER PROGRAM ORGANIZATION

3.1 INTRODUCTION

The ORNL ER Program organizational chart is shown in Fig. 6. Section 3 describes the roles and responsibilities of the key management positions.

Fig. 6. ORNL ER Program organizational chart.

3.2 ORNL ER PROGRAM MANAGER

The ORNL ER Program Manager provides leadership, management, and programmatic direction for all activities of the ORNL ER Program. The Program Manager establishes appropriate program goals, objectives, policies, and direction by means of strategic planning and interactions with division management, DOE, the regulators, and the public. The Program Manager represents the ORNL ER Program in interactions within Energy Systems, in interactions with DOE-ORO, DOE-Headquarters, and (in association with DOE) with the regulatory agencies (e.g., EPA and TDEC), other cooperating agencies (e.g., Tennessee Valley Authority, and the U.S. Geological Survey), and the general public.

In addition, the ORNL ER Program Manager

1. responds to DOE orders, Energy Systems policy directives and guidance, and Energy Systems ER Division requirements and is vested with the authority commensurate with the level of responsibility presented in this document and those assigned by delegation;
2. is responsible for quality, planning, budgeting, scheduling, staffing, coordination, and deliverables associated with ORNL ER activities; identifies areas in which adjustments in budget or staffing are required and directs efforts to acquire appropriate resources; negotiates scope and deliverables with DOE and with the regulators in conjunction with DOE;
3. identifies environmental technologies needed to achieve the ER mission, identifies regulatory or policy issues that affect the ORNL ER program mission, communicates these to ER Division management, and works with division staff and management, DOE, and others to address and resolve these issues and concerns;
4. provides oversight to private sector participants in ORNL ER activities and holds accountability for all ER work performed at the ORNL site by the other DOE prime contractors (ENSERCH, MK-Ferguson, etc.);
5. is responsible for coordinating activities and resources at ORNL with other Energy Systems managers and organizations; promotes teamwork and synergistic interactions with other Energy Systems organizations and DOE on matters related to ER;
6. is responsible for communicating program requirements and policies to the staff, and for tracking and improving quality and health and safety through implementation of a rigorous self-assessment program;
7. maintains responsibility for all personnel (i.e., staff, subcontractors, maintenance personnel, etc.) who perform work for the ORNL ER Program while they are engaged in activities for the program and ensures compliance with environmental laws and regulations;
8. implements a performance improvement process to measure the ORNL ER Program's performance and to involve the staff in activities that support a continuous improvement in performance;

9. conducts annual performance reviews of all personnel under her/his direct supervision; includes training and career development opportunities in evaluation discussions; establishes quantifiable performance plans for staff that include appropriate recognition of environmental, safety, and health (ES&H) issues; provides input to other managers for individuals matrixed to the ORNL ER Program; and
10. understands, accepts, and satisfies the responsibilities associated with the applicable conduct of operations procedures.

3.3 WASTE MANAGEMENT INTERFACE MANAGER

The ORNL ER Program interfaces at the program level with the ORNL Waste Management and Remedial Action Division through the Waste Management Interface Manager. This manager coordinates contact with Waste Management and resolves any programmatic waste management issues that arise in ORNL ER activities. These issues may involve areas where responsibilities have not been clearly defined, personnel have not been assigned, or funding is either not available or not clearly identified for some portion of a project.

3.4 DEPUTY PROGRAM MANAGER

The ORNL ER Deputy Program Manager assists and represents the Program Manager in the following areas.

1. Coordinates quality, planning, budgeting, scheduling, staffing, coordination, and deliverables associated with ORNL ER activities (The Deputy Program Manager identifies areas in which adjustments in budgets or staffing are required and directs efforts to acquire appropriate resources.);
2. Submits all performance evaluation criteria milestones; reviews performance evaluation criteria milestones and all other ORNL ER activities to ensure that they conform to the sponsor's QA and other requirements, and ensures the technical excellence of all efforts within the program.
3. Identifies environmental technologies needed to achieve the ER mission, identifies regulatory or policy issues that affects the ORNL ER Program mission, communicates these to ER Division management, and works with division staff and management, DOE, and others to address and resolve these issues and concerns.
4. Provides a focused link between the ORNL ER Program and the Program Controls Sections, Project Integration and Administration, and DOE in the development and implementation of the Management Control System.

3.5 SURVEILLANCE AND MAINTENANCE MANAGER

The Surveillance and Maintenance Manager will

1. ensure that the facility and surrounding grounds are clean and uncluttered adhering to professional standards and in accordance with *Surveillance and Maintenance Plan for Waste Area Groupings at Oak Ridge National Laboratory* (ORNL 1993c). (The Surveillance and Maintenance Coordinator will develop and implement necessary Facility Housekeeping Procedures.);
2. oversee routine site inspections as required by (ORNL 1993a); verify that check sheets are properly completed and recorded; review and approve check sheets for other surveillance activities, such as radiological, groundwater, and surface water surveillance;
3. provide operations and maintenance for WAG areas through coordination with Health Physics, Health and Safety, Industrial Hygiene, Environmental Compliance, Security, etc.;
4. provide support for baseline, construction, and postconstruction monitoring;
5. develop annual budget objectives, with input from the WAG Program Manager and the Facility Manager, pertaining to facility maintenance requirements, such as fence repair or replacement, road repair, or any facility upgrading project required to maintain the facility in a safe, healthy, and environmentally sound condition;
6. ensure that surveillance and maintenance are conducted on the site after construction as called for in the remedial design;
7. ensure that the facility is maintained in compliance with all applicable DOE/Energy Systems regulations pertaining to ES&H; and
8. be responsible for conduct of operations, oversight, administrative requirements, general facility operations, and surveillance and maintenance.

3.6 FINANCE OFFICER

The ORNL ER Finance Officer's main responsibility is to maintain control of cost and commitments within the fund limits received from DOE in the financial plan. The Finance Officer independently verifies, maintains, and ensures the integrity of the transactions taking place and facilitates the understanding and interpretation of information from the accounting system.

The Finance Officer receives information from DOE and Energy Systems ER Division concerning budgets and other finance-related matters. He or she then funnels this information to the appropriate WAG project managers (described in Sect. 4.2) and project analysts (described in Sect. 4.6) so they can take appropriate action. The Finance Officer reviews several documents prepared by project analysts based on the financial information provided: engineering service orders, account memoranda, work order memoranda, directives, estimate at completion work sheets, mid-year review documents, and year-end review

documents. Occasionally, the Finance Officer may prepare some of these documents. In addition, Finance Officers prepare and update budget and authorization changes and cost transfer forms, relocations, monthly financial reviews, and ER capital summary reports. Finally, Finance Officers consolidate uncommitted cost reports, directives, and monthly capital request reports.

Additional responsibilities of the Finance Officer include

1. initiating and/or handling all budget and accounting documents (including new accounts, work orders, cost transfers, etc.) in a timely manner, ensuring clear, accurate, and adequate justifications;
2. assisting in the development of estimates and justification for budget-level requests for operating funds, capital equipment, and construction projects;
3. coordinating all budgets and resultant costs with other organizations involved in the assigned division's/program's activities and reviewing divisional cost distributions for accurate and equitable distributions;
4. ensuring that all accounts and work orders are opened, revised, and closed in accordance with the appropriate programmatic guidance, financial plan information, and approved project performance period;
5. reviewing all costs and investigating irregularities or discrepancies, informing management, and recommending solutions to possible or real problems; and
6. reviewing charge-out or standard rates for deviations between actual and standard costs, monitoring variances, and revising standards as appropriate and in accordance with Energy Systems policy governing standard rates.

3.7 QUALITY ASSURANCE

The QA staff report functionally to the ER Site Program Manager and are responsible for evaluating the effectiveness of activities in the ER Program through surveillance and oversight functions. The QA staff assists all levels of management in preparation of ER procedures and documents, including review of project documents for inclusion of pertinent QA requirements. QA personnel also administer the corrective actions tracking, trending, and statusing functions for the ORNL ER program. QA specialists have the authority to stop work when conditions warrant such action.

3.8 TECHNICAL DATA MANAGEMENT

The technical data management function is responsible for the collection, management, and archiving of data gathered from the various remediation activities at the ORNL site into a central, consistent format suitable for analyses or presentation to DOE, regulators, or ER staff. Such data include field and laboratory analyses, U. S. Geological Survey data, and other project data generated from the several divisions at ORNL and from the various subcontractors. This information is collected into a central workstation and checked for

integrity and consistency before distribution to the regulators and DOE (by way of the Oak Ridge Environmental Information System). The technical data manager assists the project managers in their efforts to collect the data in a manner that will meet the programmatic requirements and in depiction of project data into any format (e.g., charts, tables, graphs) desired for presentation to the DOE or regulators.

3.9 ENVIRONMENTAL, SAFETY, AND HEALTH/WASTE MANAGEMENT

Environmental, safety, and health/waste management coordinator provides guidance in operations or designs as necessary to keep radiation exposures, hazardous substances exposures, or environmental releases within regulatory limits. The Environmental, safety, and health/waste management coordinator is responsible for reviewing and approving ES&H plans and waste management plans. He or she generally provides guidance to project health and safety officers (described in Sect. 4.18) on ER program-level issues. The Health and Safety/Waste Management Coordinator

1. manages and coordinates ES&H-related matters pertaining to Occupational Safety and Health Administration training, health physics, safety, industrial hygiene, engineering, environmental compliance, and medical requirements for hazardous waste workers and for ER Program staff;
2. coordinates site access requirements with ORNL site personnel for all subcontractors performing activities for the ER Program on the ORNL reservation and ensures compliance with ORNL ES&H standards by all subcontractors and DOE prime contractors that are performing activities under guidance of the ORNL ER Program;
3. interprets Energy Systems ES&H policies, standards, and procedures, DOE orders applicable to ES&H, Occupational Safety and Health Administration standards; develops program compliance; and assists in documenting audit findings that pertain to ES&H;
4. assists in the preparation and review process of all occurrence reports filed through the ORNL ER Program, ensures that the reports meet DOE and Energy Systems requirements, and investigates and files specific reports on safety and health incidents and injuries to ORNL ER Program staff;
5. enhances communication and cooperation among ORNL ES&H disciplines to resolve deficiencies or problems that may arise from project activities to reduce the impact on project operation;
6. manages surveillance activities of field and laboratory procedures performed by ER subcontractors;
7. manages and coordinates waste generation, segregation, disposal, transportation, and treatment activities affiliated with ORNL ER and coordinates and develops a waste tracking system for generators to feed back into the Energy Systems Waste Management Organization Central tracking data base; and
8. coordinates and facilitates all waste management issues with the appropriate department such as the site waste management and compliance organizations and ensures that the

laboratory and ER Division waste minimization programs are being implemented by all generators of ER Program waste.

3.10 ENGINEERING MANAGER

The Engineering Manager performs the ORNL ER Program interface with ORNL's Engineering Division. The Engineering Manager coordinates support from Engineering and resolves any programmatic engineering issues that arise from ORNL ER activities. These issues may concern areas where responsibilities have not been clearly defined, personnel have not been assigned, or funding is either not available or not clearly identified for some portion of a project.

3.11 DECONTAMINATION AND DECOMMISSIONING

The EM-40 organization of DOE-headquarters sponsors the Decontamination and Decommissioning (D&D) program at ORNL. This program aims to manage cost effectively surplus contaminated facilities which have been accepted by and supported by the EM-40 Decontamination and Decommissioning (D&D) Program. Major tasks included in this activity are (1) the surveillance and maintenance of facilities awaiting decommissioning; (2) decontamination and decommissioning of facilities; and (3) program management of all tasks conducted in support of the EM-40 D&D mission. The surveillance and maintenance task is further divided into the following subtasks (1) surveillance and maintenance planning, (2) routine surveillance and maintenance, and (3) special maintenance projects. Decommissioning projects include planning and implementation phases.

3.12 FACILITY TRANSITION

The Facility Transition Program will plan, organize, and implement programmatic and fiscal activities for large, complex projects in support of the ORNL ER Program. Energy Systems established the Facility Transition Program to plan and implement the transfer of facilities that are surplus to the other DOE operating programs for final disposition. The program's manager will be responsible for the planning, development, implementation, and oversight of projects, plans, and procedures that ensure the transition of surplus facilities in a compliant, cost-effective manner that protects human health and the environment. This manager is responsible for two major activities (isotope facilities, other facilities) within the ORNL ER Program.

3.13 REMEDIAL ACTION

The Remediation Manager directs and coordinates the efforts of the project managers in the role of an integrating contractor to provide rapid, technically sound, and cost effective remedial action in support of the DOE ER mission. The Remediation Manager ensures interaction with other program components and

1. provides leadership, supervision, coordination, and programmatic direction for remedial action activities;

2. implements and helps establish appropriate program goals, objectives, policies, and direction consistent with strategic planning and interactions with division management, DOE, regulators, and the public; and
3. represents the ORNL ER Program in interactions with Energy Systems, DOE-ORO, and DOE-headquarters, the regulatory agencies (e.g., EPA and TDEC), other cooperating agencies, the general public, and with other DOE prime contractors.

The Remediation Manager will

1. direct project managers to develop scope, budget, schedule, and staff associated with ORNL ER activities. [The Remediation Manager identifies areas in which adjustments in resources are required, directs efforts to acquire or reallocate appropriate resources, and negotiates scope, schedule, and deliverables with DOE and the regulators (in conjunction with DOE).]
2. be responsible for the timely submission of all remediation milestones, review milestones to ensure they conform to the sponsor's requirements.
3. supervise and oversee remediation activities at ORNL.
4. be responsible for coordinating activities and resources among all ORNL program remediation project and program managers, with other ORNL and Energy Systems organizations, with DOE and its prime contractors, and with the regulators, promote teamwork and synergistic interactions with other Energy Systems organizations, regulators, other DOE prime contractors and DOE on matters related to remediation.
5. serve as integrating contractor for remediation activities conducted at ORNL; coordinate with and review the work of other DOE prime contractors involved in ORNL ER activities; report comprehensive project and program status to DOE and the regulators (in association with DOE) that includes the cost, schedule, and scope of all participants.
6. perform planning functions, for example, baselines, current year work plans, and activity data sheets for all ORNL ER Program remediation projects and update them as appropriate.

3.14 BUSINESS MANAGEMENT

The Business Management entity develops cost estimates, budgets, and schedules for the remediation project. Business Management oversees work performed by estimators, project analysts, and schedulers. Energy Systems has the primary responsibility for reporting total project cost and schedule status monthly. Energy Systems will utilize the Progress Tracking System project control format as a vehicle for obtaining budget, cost, schedule, and progress information monthly from the Technical Support Contractor, the Remedial Design Manager, the Construction Manager, and DOE-ORO, and consolidate this information in the monthly status report.

3.15 TECHNICAL COORDINATION, POLICY, AND PLANNING

The Technical Support Manager's primary responsibilities include program technical integration and program technical support activities. Technical integration activities are directed toward site projects and include four main elements: conceptual model development, issues analysis, technical product consistency, and contractor oversight. Technical coordination and integration activities include assembling information about the ORNL ER sites. Information about the sites, including the waste areas and their environs, factors into assessing the magnitude of problems, their priority, and the technically feasible options. Technical integration provides benefit to the extent that the process increases knowledge and consequences of various policy options.

Under conceptual model development, the Technical Support Manager develops and/or documents an existing model for the geographical areas under the ORNL ER Program jurisdiction. Planning and implementation of remedial investigations are based on the conceptual model. The model incorporates major physical features of the White Oak Creek watershed and the pathways along which contaminants are transported. The dynamics of transport, areal contributions to the mass balance for the watershed, and the uncertainty of these estimates all influence the program's priorities. The conceptual model provides the mechanisms and magnitude estimates used for integration point risk assessment and risk-based priority analysis. The conceptual model evolves as additional information becomes available from other ORNL programs and site projects.

The Technical Support Manager also assists the ORNL ER Program with issues analysis identified or related to a diverse group of stakeholders including DOE, Energy Systems, TDEC, EPA, and the public. The issues analysis focuses on stakeholder concerns and transforms them into tasks; the Technical Support Manager will initiate and coordinate the definition of tasks. This process formalizes the assessment questions that support selections among policy options. Issues analysis also identifies the science questions, scale, and level of resolution necessary to resolve the assessment questions. The Technical Support Manager may also perform a consequence analysis of significant issues.

Many ORNL organizations and independent contractors participate in the ORNL ER Program. The Technical Support Manager's efforts in technical product consistency define the expectations for technical product quality, data sharing, the data quality objective protocol, and data quality. The Technical Support Manager may also organize technical reviews, informal project status meetings, and informal information exchange meetings. Source documents, primary documents, and a technical reviewer list will also be established.

Contractor oversight formalizes the orientation of personnel to the site conceptual model, site-wide priorities and technical product expectations. Efficiency of the ORNL ER Program depends on the time required for personnel orientation and consistency of approach, and emphasis is placed on existing primary documents. The Technical Support Manager ensures that contractors provide periodic updates of the status of their work and that they have access to primary source documents.

In addition to responsibilities in these four main areas of technical integration, the Technical Support Manager provides ORNL ER oversight and support to various activities including technology development, regulatory and environmental compliance, and risk

assessment. Additional support is provided to external and internal advisory boards, technical and public outreach, program planning, and Energy Systems ER Division.

Risk Assessment, which is supported through the technical integration component, will identify, define, and characterize potentially adverse consequences of exposure to hazardous and radioactive materials. Risk assessment tasks include a baseline risk assessment, refinement of preliminary remediation goals, and risk evaluation of remedial alternatives. Risk assessment may have both a human health and ecological risk component. This function will identify the common data needs for both the ecological and human health risk assessments during project scoping; sampling plans will be developed to avoid duplication of effort. Common data needs include contaminant concentrations in media, chemical inventories, operational history of the site, fate and transport factors, background concentration data, etc.

The Risk Assessment Coordinator will

1. implement the standards and procedures for ecological and human health risk assessment activity established by the Energy Systems ER Division, the ORNL Health and Safety Research Division, and the ORNL Environmental Sciences Division;
2. obtain and identify staff necessary to execute Energy Systems responsibilities and assignments required by risk assessment activities;
3. recommend schedules to WAG project managers and DOE prime contractors for the required performance of risk assessments in site projects;
4. develop and manage the budgets for risk assessments in ORNL ER programs;
5. provide for consistent development and application of risk assessment methodologies and techniques at all sites or areas under the ORNL ER Program responsibility;
6. ensure that the most current risk assessment practices, procedures, and information are available for application in ER risk assessment standards;
7. conduct sensitivity and uncertainty analyses to improve the available risk assessment methods and to ensure the ORNL ER Program employs the most scientifically defensible risk analyses possible and work in a cost effective manner, striving to reduce costs through lessons learned, etc.; and
8. provide interface with EPA and the state on risk assessment issues.

During the remedial investigation/feasibility study phase of a project, the Risk Assessment Coordinator will typically perform the following six distinct exercises: (1) determine the utility of existing data and additional data requirements, if any; (2) develop and use preliminary remediation goals; (3) perform a most likely exposure assessment and/or integration point assessment; (4) perform the baseline risk assessment; (5) refine preliminary remediation goals; and (6) evaluate the risk of remedial alternatives.

The Risk Assessment Coordinator will oversee the work on a baseline risk assessment. This document will analyze the potential adverse health effects (current or future) caused by

hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (i.e., under an assumption of no action). The baseline risk assessment contributes to the characterization and subsequent development, evaluation, and selection of appropriate response alternatives.

3.16 SITE DOCUMENT CONTROL

The primary responsibilities of site document control are to coordinate and direct the progress of documents throughout the publications process; ensure that quality planning and implementation of the document development process are conveyed; and report the status of all documents to the ORNL ER Site Manager. Site document control also provides the primary publications interface between ORNL ER personnel, subcontracting firms, and the editorial staff. This office oversees the development and implementation of (1) an information system for tracking documents, (2) training requirements and guidelines for ORNL ER, and (3) the operations of the document management center.

4. TYPICAL PROJECT ORGANIZATION

4.1 INTRODUCTION

The typical ORNL ER Program project organizational chart is shown in Fig. 7. It is a matrix organization within Energy Systems and among the DOE prime contractors. The roles and responsibilities are described in the following sections. The headings for the following subsections correspond to the boxes in Fig. 7.

4.2 WAG PROJECT MANAGER

All WAG Project Managers report programmatically to the Remediation Manager, whose roles and responsibilities are defined in Sect. 3.13. The WAG Project Manager has the prime integration responsibility for the success of a project: from the preliminary assessment/site investigation phase through the verification phase and up to the point that the site is returned to ORNL. The Project Manager directs and monitors the progress of each phase and is the driving force to assure project success using QA methods. The Project Manager provides technical and administrative guidance to the project management and technical staff. The Project Manager is the point of contact concerning the overall project for DOE, regulatory agencies, and other stakeholders.

The Project Manager's responsibilities include communications with DOE and regulators; definition of the program scope; estimation of program costs; development of program schedules; review of contractor and subcontractor proposals; monitoring of schedules; and finances; maintenance of project budget and schedule; preparation of progress reports; integration of the work of all DOE prime contractors; preparation of the baseline and revisions; and all support needed.

Fig. 7. Typical management team during the life of an ER project.

The Project Manager holds coordination meetings, collects information, and assembles total packages related to project activities for use by DOE-ORO. For each remediation project, the Project Manager prepares or oversees the preparation of project planning and requirements documents to include

- project management plan,
- baseline design report,
- system requirements document,
- functional requirements documents,
- QA plan,
- site health and safety plan,
- configuration management plan
- waste management plan,
- sampling and analysis plan,
- safety assessment,
- integrated surveillance plan,
- training needs assessment and training plan, and
- operational readiness review.

In general, the Project Manager on an ORNL remediation project will assemble a project team to

1. provide design review for the remedial design architect-engineering firm, including evaluations of strategies, sequencing of work, and scheduling of plant and operating interfaces;
2. conduct preremediation, remediation, and postremediation surveillance, maintenance, and monitoring activities;
3. act at DOE's direction to coordinate team efforts to achieve milestones;
4. provide overview for compliance with ES&H requirements;
5. coordinate remediation activities with ORNL operations and support activities (health physics, industrial hygiene, safety, environmental, etc.);
6. provide construction support and Title III oversight for the purposes of ensuring that the remedial action operations interface smoothly with plant operations, that all plant systems that support the remedial action effort are available on time, and that plant ES&H procedures and policies are followed; and
7. implement the ER Management Control System requirements.

4.3 REMEDIAL INVESTIGATION MANAGER

The Remedial Investigation Manager is responsible for the characterization of remediation sites. The Energy Systems Remedial Investigation Manager conducts field investigations and engineering studies. The Remedial Investigation Manager provides technical direction to the field and laboratory personnel and acts as the liaison with respect

to the remedial investigation with DOE, regulatory agencies, and other stakeholders. The Remedial Investigation Manager assembles and directs a multidisciplinary project team to ensure the successful completion of the remedial investigation. The Remedial Investigation Manager may be an Energy Systems subcontractor, and the staff performing the work may be Energy Systems subcontractors. The Remedial Investigation Manager also may be the WAG Program Manager.

4.4 TECHNICAL SUPPORT CONTRACT MANAGER

The Technical Support Contract Manager is responsible for the identification and selection of the proposed remediation alternative through the preparation of feasibility studies, proposed plans, and records of decisions. The technical support contractor is a prime contractor to DOE and utilizes DOE prime contractor personnel and subcontractors, as needed. The technical support contract manager provides technical direction and assembles and directs a multidisciplinary project team to ensure the successful completion of the feasibility study, proposed plan, record of decision, and NEPA documents.

4.5 PROJECT DATA MANAGER

The Project Data Manager provides overall data management oversight and coordination of project data acquisition, performs data custodian activities, and interacts as necessary with other data management groups. These data management organizations include the Reservation Data Systems Group of Environmental Sciences Division, Computing and Telecommunications Systems, Instrumentation and Controls Division, and Information Management Services. The Data Manager will utilize the services of one or more of these groups, as needed, to perform his/her duties: seeing that data collection follows EPA protocols, documenting where and when data is collected, ensuring the data remains in a readily accessible format, and conveying information to other groups about the timing and location of sampling activities so that one group's data collection activities are not disturbed by another group's sampling activities. The Project Data Manager provides selected data to the ER Program Information Manager, described in Section 3.12, for transfer to the Oak Ridge Environmental Information System database.

4.6 PROJECT ESTIMATOR

The estimator provides the project with cost estimates. In accomplishing this task, he/she would help develop the work breakdown structure for the project. After the baseline is established, the estimator periodically updates the project estimate with the current information. In addition to this, the estimator reviews and comments on any Architect-Engineer estimate and provides the government estimate for bid comparisons. He/she supplies all estimate detailed information requested by the project team.

4.7 PROJECT SCHEDULER

The Project Scheduler is responsible for developing formal logic networks and schedules used to plan and monitor the project status. The conceptual design documentation and

management plans will incorporate the schedule and the associated milestone schedule status reports.

4.8 PROJECT ANALYST

The Project Analyst develops baseline reporting parameters; compiles, analyzes, monitors, and reports project labor, schedule, cost, and status information; and assists the team with planning and project status reporting in accordance with Energy Systems and DOE requirements.

4.9 TECHNICAL LEAD

The Technical Lead works with available personnel to develop technically defensible analyses of the closure options. The technical lead assumes intellectual responsibility for the quality of the technical content of project documents. He or she develops and documents the project specific contaminant transport conceptual model. They also provide support to risk assessment personnel in order to develop exposure assessment scenarios that are consistent with the project conceptual model.

Additional duties for the technical lead include designing sampling and analysis scopes of work to support the confirmation of the conceptual model; confirming the conceptual model through the analysis and interpretation of empirical evidence and insuring consistency with the existing site conceptual model; and providing empirical estimates, including uncertainties, of contaminant transport and dynamics.

The Project Manager secures the necessary resources for the Technical Lead and provides information regarding the regulatory framework for the project. In the event the regulatory context of the project changes, the Project Manager and the Technical Lead work together to determine and communicate the consequences of the changes to management and the regulators.

The technical lead works on behalf of the Technical Support Manager at the project level and serves as a conduit for information to the projects from ORNL ER technical integration activities. The Technical Lead also addresses technical issues arising from project activities, and where appropriate, identifies these to the program Technical Support Manager for inclusion in program-wide issues management and policy formulation.

The technical lead has responsibility for verifying that subcontractors perform work at the site in conformance with the technical plan and objectives identified for the remedial investigation. All project-level technical information pertaining to characteristics of the WAG or site and the extent of contamination will be funneled through the Technical Lead. The technical lead will serve as an in-house consultant for technical questions and respond to data requests at the program-level or from other external organizations.

4.10 PROJECT QUALITY ASSURANCE SPECIALIST

The project QA Specialist assists the project team in making QA assessments and plans. Further, the QA Specialist monitors the documentation of all assessments and the implementation of actions and plans. He or she participates in quality failure investigation and reporting and assists in scheduling QA audits and in implementing corrective action in response to recommendations. The project QA Specialist is selected in conjunction with the ORNL ER Program QA Specialist and consults with the Program QA Specialist for guidance on all issues concerning QA.

4.11 PROJECT TRAINING SPECIALIST

The Project Training Specialist has responsibility for arranging training classes for all Energy Systems and subcontractor personnel and maintaining records.

4.12 PROJECT ANALYTICAL SERVICES COORDINATOR

The Analytical Services Coordinator interfaces with the Analytical Project Office. The coordinator obtains (1) all analytical support for the project, (2) routine waste characterization and associated laboratory services, (3) project documents establishing standards for contaminant analysis and testing, (4) audits and approvals for all laboratories performing analytical testing against these standards, (5) contracting and oversight laboratory services using both internal and external laboratories, and (6) project-tailored testing of contaminant migration through biota.

4.13 PROJECT RISK ASSESSMENT COORDINATOR

The risk assessment coordinator has responsibility for overseeing the ecological and human health risk assessments. In performing the human health risk assessment, the coordinator will (1) assist in the identification of technical objectives of the human health risk assessment strategy; (2) review and comment on the technical documentation prepared by the remedial investigation subcontractor; (3) oversee and provide guidance on the preparation of all human health risk assessment documents prepared by the Remedial Investigation subcontractor. In addition to human health risk assessments, each WAG will have an ecological risk assessment performed as part of the remedial investigation.

4.14 ENVIRONMENTAL COMPLIANCE COORDINATOR

The Environmental Compliance Coordinator works with the Technical Coordinator and serves as a regulatory specialist to ensure that project-level ER activities are being implemented in full compliance with the applicable state and federal regulations. In executing his/her duties, the Environmental Compliance Coordinator will utilize the services of the following sections of the ORNL Office of Environmental Compliance.

The Environmental Compliance Section provides guidance concerning environmental protection standards and regulatory requirements. Environmental Compliance Section staff

prepare or coordinate the preparation of all environmental permit applications; prepare and/or oversee the submittal of compliance-mandated documents (including closure plans, postclosure plans, closure certifications, notifications, etc.), other reports, and associated fee submittals to the regulators; provide oversight and compliance assessment and/or verification of ORNL's environmental permits and compliance programs; facilitate the resolution and closure of identified noncompliances and other environmental management issues; and serve as a focal point for technical communications with regulators. Major regulations requiring consideration and documentation include the Clean Water Act, Clean Air Act, Safe Drinking Water Act, RCRA, and Toxic Substances Control Act. DOE orders also may require the submission of documents.

The Environmental Review and Documentation Section provides NEPA guidance and documentation. This section's staff reviews the environmental impact of projects and prepares internal NEPA support documents. This section prepares and submits NEPA documentation to DOE for categorical exclusion or environmental assessment under Subpart D of the DOE NEPA implementing procedures found at 10 CFR 1021. The section is also responsible for verifying ORNL's compliance with NEPA and accordingly conducts inspections and prepares documentation to record the environmental effects and mitigation measures undertaken with each activity. As required by DOE directives, the section prepares NEPA status reports and maintains NEPA records for all projects.

The Environmental Surveillance and Protection Section develops and conducts compliance, effluent monitoring and environmental surveillance programs for ORNL. The section also performs data management, analysis, and reporting of compliance data; characterizes, assesses, and evaluates the consequences of human and environmental exposures due to releases of pollutants at DOE facilities; designs and implements sampling and analysis of data in support of special ORNL needs; interprets and carries out DOE orders as they apply to the various aspects of environmental monitoring programs; coordinates groundwater activities at ORNL; conducts all activities with safety and quality as prime driving elements; and interacts with other organizations to provide technical expertise concerning sampling, monitoring, and resultant data.

The Field Interface and Oversight Section (FIOS) provides on-site environmental guidance to ORNL activities. FIOS interacts with construction and engineering activities providing in-field oversight to both Energy Systems organizations and to subcontractors. FIOS staff verify and participate in event categorization and mitigation.

4.15 PROJECT WASTE MANAGEMENT COORDINATOR

The Waste Management Coordinator will

1. oversee activities of the Waste Certification Officer and approve documentation for all project generated wastes that enter or leave or are generated at the facility (The roles and responsibilities of the Waste Certification Officer are elaborated in "Waste Acceptance Criteria for Solid Waste Disposal at Solid Waste Storage Area 6," WM/WMCO — Sect. 3.3.);
2. ensure the Waste Certification Officer and operations personnel transport, store and dispose of hazardous waste, radiological waste, and nonhazardous waste in accordance

with all applicable federal, state, and local regulations and project waste management plans, and notify the Energy Systems Project Manager whenever hazardous materials or wastes are to be moved onto, from, or within the facility;

3. ensure that the Waste Certification Officer fulfills the responsibility that quantities of radioactive and hazardous materials/wastes maintained within the facility are known, documented, and within applicable limits; and
4. oversee operations and maintain documentation for waste staging areas, ensure that the Waste Certification Officer operates staging areas in accordance with DOE/ER policies and federal and state regulations.

The Waste Management Coordinator will serve as the liaison between the project staff and Waste Management and Remedial Action Division (WMRAD) at ORNL. WMRAD is responsible for the operation of all waste management facilities at ORNL, except for the sanitary sewage system, as well as facility upgrades and construction of new facilities. WMRAD manages radioactive (low-level as well as transuranic), hazardous, mixed radioactive and hazardous, medical/infectious, and solid sanitary/industrial wastes. Waste forms include gaseous, liquid, sludge, and solid.

4.16 ENGINEERING PROJECT MANAGER

The Engineering Project Manager is responsible for overseeing the remedial design and remedial action. Specifically, the Engineering Project Manager

1. ensures that the full scope of the remedial design and remedial action are completed on schedule and within budgeted funds;
2. is responsible for communications with all project team member for achieving timely decisions involving remedial design/remedial action scope, cost, schedule, change proposals, and document flow;
3. ensures that the remedial design/remedial action project team members participate in formulating job plans and labor and budget planning, and resolves and discusses project revisions with the Energy Systems Project Manager;
4. is responsible for reviewing and ensuring that all remedial design/remedial action reports are adequate, correct, and consistent and for conveying the justification and content of all changes as appropriate;
5. ensures that all required support for remedial design/remedial action is obtained from service organizations, including, but not limited to ES&H, security, maintenance, utilities, fire protection, etc.;
6. collects and issues complete remedial design and/or remedial action procurement packages, including supporting documentation;

7. keeps abreast of remedial design changes and performs a coordinating role with divisional representatives to ensure their requirements are addressed and that the remedial action is performed as intended;
8. performs the major coordinating and liaison role with DOE-ORO Project Management Division, including project reviews, and project change requests;
9. implements the engineering portions of the QA plan for the project; and
10. ensures that all review comments are incorporated.

4.16.1 Remedial Design Manager

The Remedial Design Manager will oversee preliminary design of the most likely alternative sufficient for a draft remedial design work plan. The remedial design will be revised after the public comment period and will support the preparation of the proposed record of decision and remedial action work plan for submittal to regulators. After a record of decision is signed, the Remedial Design Manager will complete the remedial design work plan and the detailed design for the alternative selected. The Construction Manager will use these two documents in procurement awards, and the documents will specify Title III support and field services as needed. The Remedial Design Manager will ensure design compliance with the record of decision and remedial design work plan. In addition to site remediation, the design will include any support activities. The Remedial Design Manager, under Title III, will monitor construction to ensure conformity with design requirements.

4.16.2 Construction Manager

The Construction Manager is responsible for construction management of direct-hire staff and subcontractors to construct the support facilities and implement the remediation. The construction project manager will implement and monitor applicable ES&H requirements for its construction activities. The Construction Manager will ensure preparation of the remedial action work plan.

4.16.3 Independent Verification Contractor

The Independent Verification Contractor will verify that the project meets the intent of the Record of Decision and the remedial design requirements. Energy Systems will provide support to the contractor during verification duties.

4.16.4 Principal Engineer

The Principal Engineer, as design manager for the project, is responsible for the technical aspects of the project from planning through construction and operational checkout. For small or less-complex projects, a Principal Engineer may not be assigned, in which case the Engineering Project Manager will implement these functions with assistance from a responsible engineering designer for the design coordination role. The Principal Engineer's responsibilities include

1. developing design criteria and design schedules and costs, and coordinating design activities of the responsible engineering designers to produce a complete and satisfactory design package;
2. working with ORNL divisional representatives to ensure that the design and design verification meet operational and technical requirements;
3. ensuring that the design achieves the scope, cost, and schedule goals;
4. ensuring adequate Title III support;
5. ensuring that value engineering has been appropriately applied; and
6. assisting the Engineering Project Manager in implementing the QA plan pertaining to engineering designs for the project.

The Principal Engineer supervises work performed by Central Engineering in such disciplines as civil, structural, instrument, and electrical engineering. These disciplines will require studies and assessments to evaluate and determine the soundness of the remediation approach. These activities include:

1. Civil Engineering support to provide the as-built drawing revisions,
2. safety assessment preparation,
3. review and comments on studies and assessments,
4. preparation of a project management plan,
5. area surveying support to Energy Systems for updating area drawings,
6. preparation of a site monitoring plan,
7. a review of the regulatory requirements to ensure compliance,
8. special studies and assessments,
9. design criteria for the remediation design.

The Principal Engineer also interfaces with the Energy Systems Engineering organization to establish systems requirements definition and analysis, project assessments and associated actions/plans, integration of special functions, application of evaluation and optimization techniques including value engineering and risk analysis, integrated system verification, operational transition, and performance tracking.

4.16.5 Construction Engineer

The Construction Engineer is responsible for coordinating all activities requiring interface among Energy Systems, the Construction Manager, DOE-ORO Project Management

Division, and remedial design field engineering throughout the construction period. The Construction Engineer will supply construction support services as needed to the Construction Manager. The Construction Engineer may also be assigned Title III responsibilities for inspection and testing services.

4.17 WAG FACILITY MANAGER

Each WAG Facility Manager at ORNL reports programmatically to the respective ER WAG Project Manager. The Facility Manager will act as the single point of contact for all WAG-related activities. The Facility Manager's scope of work covers assignments from the WAG Project Manager and requirements that derive from DOE orders, Energy Systems policies and procedures, and agreements with ORNL disciplines. These duties include coordination of WAG activities, surveillance and maintenance planning, and conduct of operations. The Facility Manager

1. assists the ER WAG Project Manager in coordinating and planning activities at the designated WAG;
2. carries out responsibilities in accordance with the ORNL standard practice procedure *Facility Management* (ORNL 1993a); the Facility Manager maintains an awareness of the status of each assigned facility; ensures that appropriate radiation work permits and safety work permits, and lockout/tagout are initiated, approved, and issued; directs the termination or restriction of operations in the WAG when judgement dictates; ensures that the division's Self-Assessment and Conduct of Operations Implementation Plans are being implemented; and monitors to resolution the status of ES&H noncompliances within the WAG;
3. ensures that facility maintenance is planned, tracked, and coordinated for each of the WAGs, which includes road and fence maintenance, vegetation and erosion control, and other surveillance and maintenance requirements;
4. ensures that the Conduct of Operations within the assigned WAG is managed with a consistent and auditable set of requirements, standards, and responsibilities in accordance with DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*;
5. supports the ER ES&H Officer and ensures that activities are conducted in accordance with applicable ES&H standards pursuant to DOE Order 5480.1B, *Environmental, Safety, and Health Program for DOE Operations*; Energy Systems Policy Procedure ESS-FS-101, *Safety of Energy Systems Operations*; and Energy Systems Policy Procedure ES-EH-100, *Energy Systems Environmental, Safety, and Health Policy Statement*;
6. ensure that support is available to the ER Program for solid low-level waste packagers, transuranic waste packagers, and hazardous waste packagers in accordance with *Waste Acceptance Criteria for Radioactive Solid Waste Disposal at SWSA-6* (Waste Management and Remedial Action Division 1993);

7. may act as Chairperson or a key participant in operational readiness reviews for remedial actions in the WAG (Operational readiness reviews and safety reviews will be conducted pursuant to *Conducting Project Readiness Reviews* (Energy Systems 1990).
8. ensures appropriate coordination of special surveillance and maintenance projects within the assigned WAG such as new fencing, placement of temporary support buildings, upgrade of level instrumentation for inactive low-level liquid waste tanks, installation of instrumentation for sampling and routine monitoring of tanks, development of a disposal system for radiologically contaminated vegetation, and resurfacing of pits and trenches.

4.18 PROJECT HEALTH AND SAFETY OFFICER

Assessments are required for Health and Safety based on known conditions at the site. Following advice from the ER Program Health and Safety Coordinator, described in Section 3.9, the WAG Project Manager appoints the Project Health and Safety Officer who is responsible to

1. ensure that all activities are conducted in accordance with applicable Health and Safety standards; ensure that the necessary permits and safety equipment/procedures are in place prior to commencement of work activities; provide the appropriate review and approval for permits and procedures for experimental activities, operations, and maintenance to ensure the hazards involved have been addressed;
2. implement the as low as reasonably achievable (ALARA) program, ensure project personnel properly wear radiation dosimeters and other personal protective equipment, and ensure that personnel are trained in general radiation protection procedures; and
3. comply with instructions from the ER Program Health and Safety Coordinator, whose activities are described in Section 3.9.

The Project Health and Safety Officer will assume the following responsibilities after the completion of construction activities:

1. maintain a facility safety program consistent with DOE/Energy Systems policies and regulations;
2. ensure that the site is properly posted for all facility hazards as well as for required safety equipment (e.g., safety glasses, hearing protection, etc.); and
3. ensure that requirements of the facility safety program are adhered to and that no new facilities, operations, or processes or modifications to existing facilities, operations or processes are allowed before proper documentation and review by the Energy Systems Project Manager and the Facility Safety Manager.

5. PROJECT PLANS

All projects subject to this program management plan will prepare all necessary plans and procedures but will use to the maximum extent possible existing plans and procedures. It is desirable for project work plans to reference programmatic plans and note any differences. All projects will have project management plans consistent with the DOE-ORO ER program management plan and this program management plan. The project management plans should reference this program management plan and not duplicate the information contained herein.

The project management plans should strive to be concise and contain only information unique to the project. The project management plans should contain the following sections: executive summary, introduction (purpose and scope), work plan and performance criteria, organization chart, project summary work breakdown structure (WBS), references to the life cycle baseline summaries for the project WBS dictionary pages, schedule, milestones, and cost estimates.

Roles and responsibilities already described in this program management plan are not to be restated. The Energy Systems Project Manager will prepare the project management plan. The ORNL ER Program Remediation Manager, ORNL ER Program QA Specialist, all DOE prime contractors, major Energy Systems participants, DOE Engineering, DOE ORNL Site Office, and DOE ER Division will review the plan as necessary. Approval for the project management plans should come from the Energy Systems Project Manager, Facility Manager, and Engineering Project Manager. If roles and responsibilities deviate from this program management plan, then the affected DOE and Energy Systems departments should approve also.

6. WORK BREAKDOWN STRUCTURE

The WBS for the ORNL ER Program, shown in Fig. 8, is consistent with the overall ER program management plan (DOE-ORO 1991) and the program baseline (ORNL 1993b). Any subsequent project management plans should reflect continuity with this plan and the ER program management plan (DOE-ORO 1991).

The WBS defines a hierarchy of products starting from the program level to the lowest level work package necessary to accomplish the program objectives. The WBS will be used as a program management tool to (1) identify the scope of all work activities, (2) plan and schedule work, (3) prepare resource budgets to support work, (4) develop spending profiles, (5) develop subcontract documents, and (6) collect technical, schedule, and cost performance data.

Figure 8 shows that the ORNL ER Program is structured around WAGs and associated operable units, in which the WAGs appear at level 6. For example, the WAG 11 program

Fig. 8. ORNL ER Program summary work breakdown structure.

has been designated the WBS number 1.4.12.6.1.11; note that the number "11" sets in the sixth place holder as divided by the decimals. A WBS dictionary further defines the scope of work by program participant. All participants will manage and schedule work, collect costs, and evaluate progress in accordance with the WBS at the work package level. Appropriate budget and reporting codes will be applied to ensure that roll up capability within the WBS is protected

7. SCHEDULE

The Energy Systems ER Program prepares and maintains the master project schedules. These master schedules are developed in accordance with the ORNL WBS and contain all controlled milestones. The master schedule is supported by a number of lower-level schedules created to match activities at levels 7, 8, or lower levels of the WBS. Energy Systems utilizes a baseline consisting of the sum of the lower-level schedules to determine progress and control milestone accomplishment.

Prior to critical path network development, the project team will establish schedule objectives that the major milestones incorporated into the schedule will address. These milestones provide points for tracking progress, decision-making, control, and reporting within the master project schedule and lower-level schedules. A sample list of controlled milestones can be found in Table 1. Changes in the planned dates for controlled milestones must be approved in accordance with the ORO Baseline Control Procedure.

The schedules will include activities that other DOE prime contractors will perform. On a monthly basis, progress for on-going activities and future projections will be provided by each prime participant and project team member and supplied to the appropriate Energy Systems Project Manager and Scheduler. This information will be used to update the project schedule and assist the project analyst in evaluating project status.

Energy Systems Program Management, Project Management, and DOE Program Management will routinely review schedule status during the normal monthly reporting process required by the monthly status report (MSR) and progress tracking system (PTS).

8. PROJECT MANAGEMENT AND COST CONTROL SYSTEMS

A project team will be developed for management of each project. This team will comprise participants from DOE, Energy Systems, Energy System's subcontractors, and the other prime contractors. Sections 3 and 4 of this plan describe the roles and responsibilities for Energy Systems members. A management control system (MCS) has been designed and developed to act as a tool for the project team members to utilize for decision making and reporting activities.

Table 1. Example of project control milestones

Description
Submit remedial investigation work plan to TDEC/EPA.
Submit site characterization summary to TDEC/EPA
Submit RCRA facility investigation report to TDEC/EPA
Submit remedial investigation/feasibility study/environmental assessment to TDEC/EPA
Submit proposed remedial action plan to TDEC/EPA
Approve record of decision
Begin remedial action
Complete remedial action
Submit postconstruction report to EPA/TDEC

The ER program management plan (DOE-ORO 1991) describes the MCS, which provides a uniform approach to be used throughout the program. The primary goal of this management system is to ensure planning and execution of each project in a manner that is technically sound, timely, and cost-effective.

The MCS is designed to have an upward flow of integrated, summarized information from Energy Systems to DOE-ORO and then to DOE-HQ, ensuring timely management decision-making by the project team. MCS assists decision-making in the following general manner.

1. The MCS provides a framework of information based on the WBS for all project data including technical, funding, schedule, and cost segments. This structure allows consistently accurate summarization and comparison of all project elements.
2. The MCS ensures that a project is planned, scheduled, budgeted, costed, and reported on in accordance with the programmatic requirements and in a timely manner.
3. The MCS defines the scope of work and assigns a responsible party. Later, it also integrates data provided by the many project participants.
4. The MCS enhances project status evaluations and projections by expediting analysis of the types of data through the use of relational databases. Afterward, the MCS displays project evaluations in report formats that both identify key problem areas and comply with DOE requirements.

9. INFORMATION AND REPORTING

Information and reporting requirements are stated in the DOE's Major System Acquisition Plan (DOE-ORO 1992b). Typical data the WAG manager will integrate into the actual cost and schedule performance data are

- costs, milestone/schedule, and technical parameters, including baseline tracking data for each subproject;
- a time-phased contractor cost plan that interfaces with the integrated installation cost plans;
- semiannual reviews — all cost and schedule data through the cutoff date for the reporting period; current status of each subproject; overall accomplishments, problems, and potential problems at the summary subproject level; and a forecast of ultimate overall performance.
- the quarterly FFA progress reports—detailed statements identifying any anticipated delays in meeting time schedules, the reasons for the delays, and the actions taken to prevent or mitigate the delays.

Table 2 summarizes deliverables as defined with the MSA OR1 reporting requirements checklist for the MCS.

10. QUALITY ASSESSMENT

All DOE prime contractors have QA programs acceptable to DOE for the implementation of their contracts. The Energy Systems ER Program QA Program Plan (Energy Systems 1993) complies with DOE Order 5700.6C "Quality Assurance" and combines the requirements of the American Society of Mechanical Engineers document, *Quality Assurance Program Requirements for Nuclear Facilities* (ASME 1989a) with the software QA requirements from ASME 1989b. Also included is the EPA guidance established in *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans* (EPA 1983). Additional EPA guidance in other areas is included. The plan also provides for compliance with DOE Orders 4700.1, "Project Management System"; 5000.3A, *Occurrence Reporting and Processing of Operations Information*; 1324.2, "Records Distribution"; and DOE/ORO 931, *Management Plan for the Oak Ridge Operations Environmental Restoration Program* (DOE-ORO 1991).

When a prime contractor or subcontractor performs an activity for the ORNL ER Program, a QA assessment must be conducted to ensure that the project meets or exceeds the requirements of the Energy Systems ER—QA Program as established in ES/ER/TM-4 (Energy Systems 1993). QA project plans are required to address activities specific to a project and will be prepared in accordance with the requirements of the QA Plan for the

Table 2. Reporting requirements

Report	Issued to	How Often
Management plan	DOE	Once
Monthly status report	DOE	Month
Milestone schedule	DOE	Month
Cost plan	DOE	Year
Milestone status	DOE	Month
Management control system description	DOE	Once
WBS dictionary	DOE	As Required
Cost performance reports	DOE	Month
Contract funds status	DOE	Month
BCWS plan	DOE	Year
Program review	DOE	Semiannual
Fiscal year work agreement	DOE	Year
Project review	DOE	Quarter
Progress tracking system	DOE	Month
FFA quarterly	DOE/EPA	Quarter
Uncommitted cost	DOE	Month
Contract management plan		Once
WAG remediation plan		Once
Quality assurance plan		Once
System requirements doc		Once
Project waste management plan		Once
Project records plan		Once
Preliminary estimate		Once
Detailed estimate		Once
Cost-risk analysis		Once
Contingency analysis		Once
Baseline change proposals		As required

ORNL ER Program (ORNL/ER-225). Any organization issuing a contract, task order, or other type of work authorization on an ORNL ER project, must ensure that the receiving organization has an acceptable QA program relative to the task(s) being performed.

11. REFERENCES

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