

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND/OVERVIEW

1.1.1 General

DOE is the Federal agency responsible for providing the Nation with nuclear warheads and ensuring that those weapons remain safe, secure, and reliable. The Oak Ridge Y-12 Plant (Y-12) is one of three primary installations on the U.S. Department of Energy (DOE) Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee. Figure 1.1.1–1 shows the location of the ORR. The other installations are the Oak Ridge National Laboratory (ORNL) and the East Tennessee Technology Park (ETTP) (formerly the Oak Ridge K-25 Site). Construction of Y-12 was started in 1943 as part of the World War II Manhattan Project. The early missions of the site included the separation of ^{235}U from natural uranium by the electromagnetic separation process and manufacturing weapons components from uranium and lithium.

Late Changes Affecting the Y-12 SWEIS

In the interim period between submitting the Draft Y-12 SWEIS for approval and the printing of the document for public release, a number of changes have occurred that affect some of the terminology used in the Y-12 SWEIS. Specifically, the changes involve:

- The National Nuclear Security Administration was established by Congress to manage the Nation's nuclear weapons complex. The National Nuclear Security Administration is a semi-autonomous agency within the Department of Energy. As one of the major production facilities within the nuclear weapons complex, Y-12 falls under the responsibility of the Y-12 Area Office as of October 1, 2000, under the new National Nuclear Security Administration. The National Nuclear Security Administration was created on March 1, 2000.
- Replacement of Lockheed Martin Energy Systems, Inc., by BWXT-Y12, L.L.C. as the M&O contractor for Y-12 on November 1, 2000.
- Change in the name of the Oak Ridge Y-12 Plant to Y-12 National Security Complex as of November 2, 2000.

Because these changes do not affect analyses present in the Y-12 SWEIS and in order to expedite public review, required revisions to the document will be made in the final version of the Y-12 SWEIS.

As one of the DOE major production facilities, Y-12 has been the primary site for enriched uranium processing and storage, and one of the primary manufacturing facilities for maintaining the U.S. nuclear weapons stockpile. Y-12 also conducts and/or supports nondefense-related activities including environmental monitoring, remediation, and decontamination and decommissioning (D&D) activities of the Environmental Management (EM) Program; management of waste materials from past and current operations; research activities operated by ORNL; support of other Federal agencies through the Work-for-Others Program and the National Prototyping Center; and the transfer of highly specialized technologies to support the capabilities of the U.S. industrial base (DOE 1999k).

During a September 1994 Defense Nuclear Facilities Safety Board (DNFSB) technical staff review, weaknesses were identified in the Y-12 Plant Conduct of Operations Program related to its criticality safety program. While these weaknesses did not represent a technical risk to facility workers, meaning that the required margins of safety were in place, they did indicate issues with training, document control, understanding of requirements, and procedures. After a full Y-12 Plant review, Plant management suspended all work not necessary to maintain regulatory compliance or that would pose a threat to the safety basis for the Plant (Stand-Down Status) until improvements could be implemented to the Conduct of Operations program. As of today, many, but not all Y-12 Plant facilities and processes have returned to Operating Status (i.e., executing the work for which the process, facility, or system was designed) (DNFSB 1994).

Source: DOE 1996e.

FIGURE 1.1.1-1.—*Location of Oak Ridge Reservation, Principal Facilities, and Surrounding Area.*

In response to the end of the Cold War and changes in the world's political regimes, the emphasis of the U.S. nuclear weapons program has shifted dramatically over the past few years from developing and producing new weapons to dismantlement and maintenance of a smaller, enduring stockpile. Even with these significant changes, DOE's responsibilities for the nuclear weapons stockpile continue, and the President and Congress have directed DOE to continue to maintain the safety, security, and reliability of the nuclear weapons stockpile.

In order to meet the challenges of the post-Cold War era, DOE prepared three programmatic environmental impact statements (PEISs) to analyze alternatives dealing with certain national security requirements. The *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE 1996e), which was completed in September 1996, evaluated alternatives for maintaining the safety and reliability of the nuclear weapons stockpile without underground nuclear testing or production of new-design weapons. In the SSM PEIS Record of Decision (ROD), DOE decided to maintain the national security missions at Y-12, but to downsize the plant consistent with the reduced requirements. The *Storage and Disposition of Weapons-Usable Fissile Material Programmatic Environmental Impact Statement* (S&D PEIS) (DOE 1996h), which was completed in December 1996, evaluated alternatives for the long-term storage of fissile material and the disposition of surplus fissile material. In the S&D PEIS ROD, DOE decided that Y-12 would also store surplus enriched uranium pending long-term disposition. In addition, the *Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement* (S-HEU EIS) (DOE 1996b), which was completed in June 1996, evaluated alternatives for the disposition of weapons-usable highly enriched uranium (HEU) that has been declared surplus to national defense needs. In the S-HEU EIS ROD, DOE decided that Y-12 would be one of four sites for blending up to 85 percent of the Nation's surplus HEU to low enriched uranium for commercial use as fuel feed for nuclear power plants and dispose of the remaining low enriched uranium as low-level waste (LLW). Section 1.1.4 discusses DOE's decision resulting from these PEISs.

1.1.2 Stockpile Management Restructuring Initiative

The ongoing Stockpile Management Restructuring Initiative project supports the plan for downsizing the Y-12 Plant consistent with the future nuclear weapons secondary and case manufacturing mission defined by the SSM PEIS ROD. The purpose of the Stockpile Management Restructuring Initiative project is to assist in preparing the Y-12 Plant for the future production mission requirements for nuclear weapon secondaries, case components, and other miscellaneous components, while providing a smaller, more cost-effective production size. The ongoing downsizing task is to minimize the number of major buildings required while maintaining the capability to perform the Defense Programs (DP) production mission.

1.1.3 Y-12 Site Integrated Modernization Program

In 1999, DOE's Office of Defense Programs asked DOE-Oak Ridge Operations (ORO) and Lockheed Martin Energy Systems, Inc. (LMES) to determine what activities would be required to develop and implement a program to modernize Y-12's facilities and ensure its capability to meet future stockpile needs. Consistent with that request, the Y-12 Site Integrated Modernization (Y-SIM) Program was established to develop and is currently implementing plans for modernizing Y-12.

The envisioned modernized Y-12 Plant includes the eventual replacement or upgrade of all major production facilities that support the DP Mission. Whereas current operations are housed in multiple facilities scattered throughout the west end of the Y-12 Plant, the envisioned Y-SIM Plant would consolidate operations into fewer, more efficient facilities. The ultimate goal is a modernized Y-12 Plant containing the following facilities:

- HEU Materials Facility for storage of assembled weapons secondaries and other forms of HEU
- Special Materials Complex for production of special materials (e.g., beryllium, plastic parts)
- Highly Enriched Uranium Manufacturing Facility
- Assembly/Disassembly/Quality Evaluation Facility for the assembly, disassembly, and surveillance of nuclear weapons secondaries
- Lithium Operations Complex for production of lithium hydride and lithium deuteride parts
- Depleted Uranium Operations Facility for production of depleted uranium parts and other nonnuclear components
- Other production support facilities
- Utility and infrastructure facilities

The extent of Y-12 modernization toward this desired goal is dependent upon many factors, including sustained funding. Construction of new facilities proposed by the Y-SIM Program would be accomplished through a series of Budget Line Item construction projects.

The Y-SIM Program would improve Y-12 capabilities by:

- Improving worker protection through the use of engineered controls
- Improving safety, environmental, and security compliance through the use of modern facilities and advanced technologies
- Supporting responsiveness to the Science-based Stockpile Stewardship Program through increased flexibility and use of advanced technologies
- Reducing costs through lowered maintenance costs and improved operating efficiencies

In support of the proposed HEU Materials Facility, the first component of the Y-SIM Program, the Conceptual Design Report (Y-12 1999a) has been prepared and issued, the Project Execution Plan has been prepared, and activities have been performed to support an Independent Project Assessment and project validation to include it as a Fiscal Year (FY) 2001 Line Item Project. The feasibility, design, costing, and pre-*National Environmental Policy Act* (NEPA) review of the HEU Materials Facility considered different siting locations, different designs (e.g., above-ground, below ground, or combination of both), and issues such as material storage and security requirements. Based partially on cost and security requirements, the above-ground design was selected and the potential sites for constructing the new structure was screened down to two locations. Further DOE internal scoping of the project for NEPA review also revealed a possible alternative to constructing the new HEU Materials Facility (e.g., upgrade the existing HEU facility). This upgraded/expanded facility alternative was considered reasonable for NEPA analyses based on earlier preliminary feasibility and costing studies and is included in the NEPA review for the HEU Storage Mission alternatives.

In addition, the planning and design of the Special Materials Complex have been expedited so that construction of the proposed new facility is expected to commence in FY 2003. Alternatives for the siting,

construction, and operation of the HEU Materials Facility and Special Materials Complex are included in this *Site-Wide Environmental Impact Statement (SWEIS) for the Oak Ridge Y-12 Plant*. The other potential Y-SIM Program facilities (i.e., production, production support, and utility and infrastructure) are still under early feasibility studies and are not included as proposed projects in the Y-12 SWEIS. However, these potential future facilities are described in Section 3.3 (Potential Future Y-12 Site Integrated Modernization Projects) based on their current level of development. Further NEPA review would be required when these facilities are formally proposed and ripe for decision.

1.1.4 Proposed Action and Scope

The RODs from the SSM PEIS, the S&D PEIS, and the S-HEU EIS form a starting point for the scope of actions that are included in this Y-2 SWEIS. In the SSM PEIS ROD, DOE decided to maintain the national security missions at Y-12, but to downsize the plant consistent with reduced requirements. These national security missions include (1) maintaining the capability and capacity to fabricate secondaries, limited life components and case parts for nuclear weapons; (2) evaluating components and subsystems returned from the stockpile; (3) storing enriched uranium that is designated for national security purposes (also referred to as nonsurplus enriched uranium); (4) storing depleted uranium and lithium materials and parts; (5) dismantling nuclear weapons secondaries returned from the stockpile; (6) processing uranium and lithium (which includes chemical recovery, purification, and conversion of enriched uranium and lithium to a form suitable for long-term storage and/or future use); and (7) providing support to weapons laboratories. In the S&D PEIS ROD, DOE decided that Y-12 would also store surplus enriched uranium pending long-term disposition. In the S-HEU EIS ROD, DOE decided that Y-12 would be one of four sites for blending up to 85 percent of the Nation's surplus HEU to low enriched uranium for commercial use as fuel feed for nuclear power plants and dispose of the remaining low enriched uranium as LLW.

In accordance with the SSM and S&D RODs, DOE proposes to provide the capability and capacity to maintain the Nation's stockpile, in support of the U.S. Nuclear Weapons Program. Furthermore, DOE will continue the processing and storage of enriched and depleted uranium, lithium compounds, and other materials, as well as the manufacturing and assembly/disassembly mission assigned to Y-12 in the safest, most secure and most efficient manner practicable. In accordance with the S-HEU EIS ROD, Y-12 may blend surplus HEU to produce material for commercial use as fuel feed for nuclear power plants and dispose of the remaining material as LLW. Blend stock for this activity may include DOE surplus low enriched uranium and natural uranium or commercial natural uranium. These materials would be stored on-site on an interim basis to support blending of HEU. The Y-12 Plant currently blends small quantities of HEU with low enriched, depleted, or natural uranium to produce a metal or oxide product suitable for use in various reactor programs and for multiple supply orders to DOE customers. The Y-12 Plant does not have the capability to blend large quantities of HEU (tons/year). Facility upgrades or new building construction would be required to install this process at Y-12. Further NEPA review would be needed to initiate these facility upgrades or any new building construction.

The Y-12 SWEIS physical area of analysis for the Plant is shown in Figure 1.1.4-1. A detailed map of current facility utilization at Y-12 is provided in Figure 1.1.4-2.

Source: Tetra Tech, Inc./LMES 2000a.

FIGURE 1.1.4-1.—*The Y-12 Site-Wide Environmental Impact Statement Area of Analysis.*

Source: Tetra Tech, Inc./LMES 2000a.

FIGURE 1.1.4-2.—Alternative 1A (No Action - Status Quo Alternative) Facility Location and Utilization at Y-12.

1.2 ALTERNATIVES ANALYZED

The alternatives presented in the Y-12 SWEIS have changed significantly during this NEPA process from those identified in the Notice of Intent (NOI) on March 17, 1999. Internal DOE scoping, which formed the alternatives in the NOI, focused on the modernization of the Y-12 Plant. In this respect, alternatives (e.g., Upgrade Alternative, New Construction Alternative, and Upgrade/New Construction Alternative) centered on upgrades and new construction at the Plant for DOE to accomplish the mission assigned to Y-12 based on SSM PEIS and S&D PEIS ROD decisions. During preparation of the Y-12 SWEIS it became apparent that these alternatives were too broad, not well defined, and lacked the data needed to analyze the potential impacts. A reevaluation of the DOE proposed action for the Y-12 Plant resulted in the current alternatives analyzed in this SWEIS. The new alternatives focus on two of Y-12 Plant's mission components; the HEU Storage Mission and the Special Materials Mission.

The alternatives analyzed in the Y-12 SWEIS are based on the fact that the future mission of Y-12 (to maintain the capability and capacity to fabricate nuclear weapons secondaries, and limited life components and case parts in support of the U.S. Nuclear Weapons Program and to store non-surplus HEU long-term and surplus HEU pending disposition) has already been decided in the SSM and S&D PEISs and RODs. Therefore, "traditional" SWEIS alternatives such as Expanded Operations, Reduced Operations, or Site Closure are not appropriate and are not analyzed. Instead, the Y-12 SWEIS alternatives focus on factors that consider (1) Y-12's Mission; Y-12 already has the capability to perform its assigned stockpile mission, (2) Stockpile Management Restructuring Initiative; implementing downsizing actions consistent with the SSM ROD that enable Y-12 to more efficiently and cost effectively maintain that capability, and (3) Y-SIM Program modernization actions.

Because all operations at the Y-12 Plant have not regained operational readiness from the stand-down of the Y-12 Plant in 1994, the existing Y-12 activities and environmental conditions do not reflect a true No Action for the Y-12 Site for comparison of action alternative impacts. Therefore, two No Action Alternatives are presented in this SWEIS; No Action - Status Quo and No Action - Planning Basis Operations. The No Action - Status Quo Alternative, which is basically the status of Y-12 in 1998, is presented in this SWEIS to show the increase in production levels and potential impacts under the No Action - Planning Basis Operations Alternative and the action alternatives. The No Action - Status Quo Alternative is not considered reasonable for future Y-12 operations because it would not meet Y-12 mission requirements. The No Action- Planning Basis Operations Alternative represents a Y-12 Plant operated at full planned and required work levels.

Table 1.2-1 shows the alternatives for the Y-12 HEU Storage Mission and Special Materials Mission components analyzed in this Y-12 SWEIS. The alternatives are described in detail in Chapter 3 and summarized in the following discussion.

Implementation of any of the action alternatives for the HEU Storage Mission or Special Materials Mission would result in the potential for surplus DP facilities and their possible transitioning to EM for cleanup and D&D. Appendix A.1 describes the Y-12 Plant facility transition process in detail. Estimated D&D wastes from vacated HEU storage facilities and special materials operation facilities are provided in Chapter 5 (Section 5.11) of this SWEIS.

Y-12 Site Alternatives

Alternative 1A (No Action - Status Quo Alternative). The No Action - Status Quo Alternative represents the current level of operations at Y-12 as reflected by the most recent monitoring data (1998) for the Y-12 Site and reported in the 1998 Annual Site Environmental Report (ASER) issued in 1999. Although

approximately 40 percent of these types of operations associated with DP's assigned mission were operational ready in 1998 (following the Y-12 Plant stand-down of 1994), the Y-12 Plant was only operating at 10 percent capacity. This state/condition is used in the SWEIS as a basis for comparison of the impacts associated with the No Action - Planning Basis Operations Alternative and the actions that reflect full Y-12 DP mission operations at required levels plus recently approved projects by EM and ORNL at Y-12. The No Action - Status Quo Alternative is not considered a reasonable alternative for future Y-12 operations because it would not meet Y-12 mission needs and would not reflect DOE's decision in the SSM PEIS ROD (61 FR 68011) to maintain and downsize the DP mission at Y-12

TABLE 1.2-1.—Y-12 SWEIS Alternatives

Y-12 Mission -	<p align="center">Alternative 1A No Action - Status Quo Alternative (Partial Stand-Down Operation)</p>
HEU Storage Mission	<p align="center">Alternative 1B No Action - Planning Basis Operations Alternative (Continue historic mission operations)</p> <p align="center">No Action (Same as Alternative 1B) (Continue HEU storage in existing facilities)</p> <p align="center">Alternative 2A No Action - Planning Basis Operations Plus Construct and Operate New HEU Materials Facility (Site A or Site B)</p> <p align="center">Alternative 2B No Action - Planning Basis Operations Plus Upgrade to existing Building 9215</p>
Special Materials Mission	<p align="center">No Action (Same as Alternative 1B) (Continue special materials operations in existing facilities with limited capabilities)</p> <p align="center">Alternative 3 No Action - Planning Basis Operations Plus Construct and Operate New Special Materials Complex (Site 1, Site 2, or Site 3)</p>
Both HEU Storage Mission and Special Materials Mission	<p align="center">No Action (Same as Alternative 1B) (Continue historic HEU storage and special materials operations in existing facilities)</p> <p align="center">Alternative 4 No Action - Planning Basis Operations Plus Construct and Operate a New HEU Materials Facility and a New Special Materials Complex</p>

Alternative 1B (No Action - Planning Basis Operations Alternative). This alternative reflects the historic nuclear weapons program missions at Y-12, and includes the manufacture and assembly/disassembly of weapons components and the continued processing and storage of enriched uranium materials in existing facilities at required nuclear weapons stockpile support work levels. The No Action - Planning Basis Operations Alternative also includes other nondefense-related program activities at Y-12 that have been approved and would be implemented during the 10-year planning period. Nondefense-related program activities included under the No Action - Planning Basis Operations Alternative are the construction and

operation of a new *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) waste disposal cell (referred to as the Environmental Management Waste Management Facility) to accommodate wastes resulting from environmental remediation, and the implementation of an Office of Science Field Research Center project at Y-12.

The Environmental Management Waste Management Facility would be constructed in Bear Creek Valley just west of the Y-12 Plant in an area currently designated for waste management activities. The Field Research Center component of the ORNL Natural and Accelerated Bioremediation Research (NABIR) Program would also be located in Bear Creek Valley near the Y-12 S-3 ponds.

Alternative 2 (No Action - Planning Basis Operations Alternative Plus HEU Storage Mission Alternatives). This alternative includes the No Action - Planning Basis Operations Alternative Plus an HEU storage facility. Options considered for HEU storage include a new HEU Materials Facility at one of two proposed sites (e.g., Sites A and B), and expansion of Building 9215. Candidate sites for the new HEU Materials Facility are located on the west end of the Y-12 Plant in the West Portal Parking Lot (Site A) and in the area of the Y-12 Scrap Metal Yard (Site B). The proposed HEU Materials Facility would be a single-story concrete structure covered by an earthen berm. The expansion of Building 9215 would be a new two-story concrete and steel structure attached to the north end of the building.

Alternative 3 (No Action - Planning Basis Operations Plus Special Materials Mission Alternative). This alternative includes the No Action - Planning Basis Operations Alternative Plus a new Special Materials Complex at one of three proposed sites (e.g., Sites 1, 2, and 3). Candidate sites for the new Special Materials Complex are located in the west end of the Y-12 Plant. Two potential sites are in the area of the Y-12 Scrap Metal Yard (Sites 2 and 3) and one site is located northwest of Building 9114 and on the north side of Bear Creek Road (Site 1). The proposed Special Materials Complex would include a Beryllium Facility, a Manufacturing Warehouse Facility, a Purification Facility, an Isostatic Press Facility, and a Core Support Facility. All facilities in the Complex would be connected by covered corridors.

Alternative 4 (No Action - Planning Basis Operations Plus HEU Materials Facility Plus Special Materials Complex). This alternative includes the No Action - Planning Basis Operations Alternative Plus Construction and Operation of a New HEU Materials Facility at one of two proposed sites and construction and operation of a New Special Materials Complex at one of three proposed sites.

1.3 LAWS AND REGULATIONS AND NATIONAL ENVIRONMENTAL POLICY ACT STRATEGY

This SWEIS has been prepared in accordance with Section 102(2)c of NEPA of 1969, as amended in the United States Code (42 U.S.C. 4321 et seq.), and regulations promulgated by the Council on Environmental Quality (CEQ) within the *Code of Federal Regulations* (CFR) (40 CFR 1500-1508) and DOE (10 CFR 1021), and follows DOE guidance (DOE 1998c). Under NEPA, Federal agencies, such as DOE, proposing major actions that could significantly affect the quality of the human environment are required to prepare an EIS to ensure that the environmental consequences of the proposed action and its alternatives are available to the public and considered before decisions to take an action are made.

For certain large multiple-facility sites, such as Y-12, a SWEIS is prepared (10 CFR 1021.330). The purpose of a SWEIS is to (1) provide DOE and its stakeholders with an analysis of the individual and cumulative environmental impacts resulting from both ongoing and reasonably foreseeable new operations and facilities (i.e., reasonable alternatives) at a DOE site, (2) provide a basis for site-wide decision making, and (3) improve and coordinate agency plans, functions, programs, and resource utilization. A SWEIS can be used to efficiently and effectively analyze multiple proposals and help establish an efficient, environmentally sound,

and cost-effective plan for operating the site and its facilities. Additionally, a SWEIS provides an overall NEPA baseline for a site that is useful as a reference when project-specific NEPA documents are prepared. In accordance with 10 CFR 1021.330(d), DOE shall evaluate the SWEIS at least every 5 years after its completion to determine whether it remains adequate, should be supplemented, or should be replaced with a new SWEIS.

The DOE strategy for NEPA review of both the SSM and S&D programs consists of multiple phases. The first phase was to prepare PEISs (now completed) to support program-wide decisions. In the second phase, DOE would prepare necessary programmatic and/or project-specific NEPA documents required to implement any site-wide decisions. This Y-12 SWEIS is the next step for DOE's NEPA strategy for Y-12. Project-specific analyses for the proposed HEU Materials Facility and Special Materials Complex are included in this Y-12 SWEIS.

1.4 RELATIONSHIP OF THIS ENVIRONMENTAL IMPACT STATEMENT WITH OTHER *NATIONAL ENVIRONMENTAL POLICY ACT* REVIEWS

DOE has prepared or is currently preparing other programmatic, project-specific, and site-wide NEPA documents that influence the mix of potential long-term missions at Y-12. These documents, and their relationship to the Y-12 SWEIS, are discussed below.

1.4.1 Programmatic *National Environmental Policy Act* Reviews

DOE has prepared several PEISs to determine how best to carry out its national security requirements. As a result, DOE has already made a number of decisions related to the long-term storage and disposition of fissile material, the maintenance of national security, and reliability of the nuclear weapons stockpile. Y-12, based on DOE's programmatic decisions, has been selected to fulfill an integral role in the continuance of DOE's programs supporting the Nation's nuclear defense. The alternatives considered in this SWEIS are consistent with DOE's "higher-tier" programmatic requirements and are designed to support and implement the Y-12 related decisions made by DOE in the respective PEIS and EIS RODs. In these RODs, DOE decided that the mission of Y-12 would not change and that Y-12 would continue to maintain the capability and capacity to fabricate nuclear weapons secondaries and limited life components and case parts in support of the U. S. Nuclear Weapons Program, and store non-surplus HEU long-term and surplus HEU pending disposition. This SWEIS "tiering" NEPA review (i.e., preparing site-specific analysis concentrating on the issues specific to the Y-12 SWEIS to implement the decisions made in the broader programmatic environmental impact statements) analyzes the potential environmental impacts associated with the various Y-12 proposed actions and alternatives for implementing these decisions. Each of the controlling PEISs is summarized below.

Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (DOE/EIS-0236, DOE 1996e). A ROD was issued on December 19, 1996 (61 FR 68014). As identified in the ROD, DOE decided not to change the mission at Y-12 but maintain and downsize the DP missions including the weapons secondary and case component fabrication capability at Y-12. Figure 1.4.1-1 shows the facilities of the DOE complex and the missions of each respective site. The Y-12 SWEIS tiers off of the SSM PEIS and analyzes alternatives for implementing the decisions reached in the SSM PEIS ROD. The ROD decision forms the basis for the No Action - Planning Basis Operations Alternative (e.g., continue historic mission) and the alternative for the Special Materials Mission presented in this Y-12 SWEIS.

Source: DOE 1996e.

FIGURE 1.4.1-1.—*Current Department of Energy Stockpile Stewardship and Management Sites.*

Storage and Disposition of Weapons-Usable Fissile Materials, Final Programmatic Environmental Impact Statement (DOE/EIS-0229, DOE 1996h). A ROD was issued on January 14, 1997 (62 FR 3014). In the ROD, DOE decided that Oak Ridge, in particular Y-12, would continue to store nonsurplus HEU (long-term) and surplus HEU (on an interim basis) in upgraded facilities pending disposition. The Y-12 SWEIS tiers off of the S&D PEIS and analyzes alternatives for implementing the decision reached in the S&D PEIS ROD. The ROD decision forms the basis for continuing the HEU Storage Mission at Y-12 and the proposal to construct and operate a new HEU Materials Facility at Y-12.

Waste Management Programmatic Environmental Impact Statement (DOE/EIS-0200-F, DOE 1997c). The Final PEIS was issued in May 1997. Multiple RODs are being prepared for various categories of waste. A ROD for the Treatment of Non-Wastewater Hazardous Waste was issued on July 30, 1998 (63 FR 41810). In the ROD, DOE decided to continue to use off-site facilities for the treatment of major portions of the non-wastewater hazardous waste generated at DOE sites. In accordance with the ROD, the ORR, including Y-12, will treat some of its own non-wastewater hazardous waste on-site, where capacity is available in existing facilities and where this is economically favorable. The treatment of Y-12 non-wastewater hazardous waste is included in the Y-12 SWEIS Alternative 1A (No Action - Status Quo Alternative). A second ROD for transuranic (TRU) waste was issued on January 23, 1998 (63 FR 3629). TRU waste at the ORR will be packaged to meet waste acceptance criteria for the Waste Isolation Pilot Plant (WIPP) in New Mexico and then stored on-site for eventual disposal at the WIPP. Y-12 does not generate or manage TRU waste. DOE's preferred alternative for management of LLW and mixed LLW was issued December 5, 1999 (64 FR 69241). For the management of LLW and mixed LLW, DOE prefers regional disposal at the Hanford Site and Nevada Test Site. ORR would continue disposal of LLW generated on-site including Y-12's. The disposal of on-site generated LLW from Y-12 is included in the Y-12 SWEIS Alternative 1B (No Action - Planning Basis Operations Alternative). The ROD for LLW and unified LLW treatment and disposal was consistent with those preferred alternatives and was issued on February 25, 2000 (65 FR 10061).

Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapons Components (DOE/EIS-0225, DOE 1996f). The ROD was issued on January 27, 1997 (62 FR 3880). In the ROD, DOE decided that Pantex would continue nuclear weapons operations involving assembly and disassembly of nuclear weapons. The decisions announced in the ROD did not affect the continued shipment of HEU and depleted uranium components to Y-12 resulting from the disassembly of weapons. Uranium components received from Pantex are included in the Y-12 activities and all the alternatives analyzed in this Y-12 SWEIS.

1.4.2 Project-Specific National Environmental Policy Act Reviews

Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement (DOE/EIS-0240, DOE 1996b). A ROD was issued on August 5, 1996 (61 FR 40619). Y-12 is one of four domestic sites selected to potentially down-blend weapons-usable surplus HEU to nonweapons-usable low enriched uranium for use as commercial reactor fuel or as a LLW. Capabilities exist at the Y-12 Building 9212 to perform only small-scale (kg/year) HEU blending operations. The small-scale (kg/year) down-blending of HEU is included in the Y-12 No Action - Planning Basis Operations Alternative. The large-scale (tons/year) down-blending operations cannot be performed at Y-12 without major building and process upgrades or new construction. No projects have been proposed to increase the capacities at Y-12 at this time. Therefore, the potential impacts of this operation are included under cumulative impacts in Chapter 6 of this Y-12 SWEIS. Impacts of upgrades or construction will be analyzed when those projects are identified.

Interim Storage of Enriched Uranium Environmental Assessment (DOE/EA-0929). This Environmental Assessment (EA) and the finding of no significant impact (FONSI) were issued on September 14, 1995 (60

FR 54068). It allowed for the continued interim storage of enriched uranium at Y-12, with an increase in the amount of material stored above the historical maximum level. The S&D PEIS, discussed above, confirmed and extended this mission beyond the 10 years assessed in the EA. The long-term Y-12 HEU Storage Mission is addressed in Alternatives 1B, 2A, 2B and 4 of this Y-12 SWEIS.

Final Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor (DOE/EIS-0288, DOE 1999b). A ROD was issued on May 6, 1999 (64 FR 26369). Y-12 is one of the sites identified to potentially down-blend HEU to low enriched uranium for use in commercial light water reactors to support tritium production. Building 9212 HEU blending operations could be used to support the tritium production mission. See the discussion at the beginning of this section under the *Disposition of Surplus Highly Enriched Uranium Final EIS* for the status of this potential project at Y-12 and its coverage in this Y-12 SWEIS.

Replacement and Operation of the Anhydrous Hydrogen Fluoride (AHF) Supply and Fluidized-Bed Chemical Processing Systems Environmental Assessment (DOE/EA-1049). The EA and FONSI were issued on September 20, 1995 (DOE 1995b). This allowed for replacement of the AHF supply and fluidized-bed reactor systems at Y-12 to meet operational and safety requirements and extend the life of the process by approximately 20 years. This project is included in the No Action - Status Quo Alternative of this Y-12 SWEIS.

1.4.3 Oak Ridge Reservation National Environmental Policy Act Reviews

Environmental Assessment for Selection and Operations of the Proposed Field Research Centers for the National and Accelerated Bioremediation Research (NABIR) Program (DOE/ EA - 1196). A FONSI was issued on April 18, 2000. The EA evaluated impacts of operating a field research component of the NABIR Program at two alternative sites; ORNL/Y-12 Site and the Pacific Northwest National Laboratory/DOE Hanford 100 - H area in Richland, Washington. The ORNL/Y-12 Site was selected as the site for the field research component. The Field Research Center is included in the Y-12 SWEIS under the No Action - Planning Basis Operations and is proceeding independent of the Y-12 SWEIS. The mission of the NABIR Program or the potential environmental impacts from the operation of the Field Research Center are not expected to change over the proposed 10-year life of the program.

Spallation Neutron Source (SNS) Environmental Impact Statement (DOE/EIS-0247, DOE 1999c). The Final EIS was issued in April 1999 and the ROD on June 18, 1999 (64 FR 35140). This document evaluates four DOE alternative sites for construction and operation of a new SNS facility. The preferred alternative, a site near ORNL on the ORR, was selected. The potential cumulative impacts of this project are included in this Y-12 SWEIS.

Lease of Land and Facilities Within the East Tennessee Technology Park Environmental Assessment (DOE/EA-1175, DOE 1997d). A FONSI was issued on December 1, 1997. The EA evaluated impacts of alternatives on future use and/or disposition of surplus facilities at the former K-25 Site on the ORR, and allowed for the lease of some facilities and land to commercial entities. The potential cumulative impacts of DOE land transfers are included in this Y-12 SWEIS.

Long-Term Management and Use of Depleted Uranium Hexafluoride Programmatic Environmental Impact Statement (DOE/EIS-0269, DOE 1999d). The Final PEIS was issued in April 1999 and the ROD on August 2, 1999 (64 FR 43358). The ETTP (formerly the Oak Ridge K-25 Site) currently manages and stores this material pending transfer to another DOE site. Potential cumulative effects at ORR of this program are included in this Y-12 SWEIS.

Environmental Assessment for the U.S. Department of Energy, Oak Ridge Operations, Receipt and Storage of Uranium Materials for the Fernald Environmental Management Project Site (DOE/EA-1299, DOE 1999e). The Final EA/FONSI was issued on April 13, 1999. Y-12 and the ETTP are available sites for storage of materials being removed in the cleanup effort at the Fernald Site in Ohio. Potential impacts on Y-12 from the EM program are included in this Y-12 SWEIS.

Transuranic Waste Treatment Facility Environmental Impact Statement (DOE/EIS-0305). The Final EIS was issued June 2000 and the ROD on August 9, 2000 (65 FR 48683). DOE has selected the Low-Temperature Drying Alternative (the preferred alternative in the Final EIS) and will proceed with the construction, operation, and D&D of the TRU Waste Treatment Facility at ORNL. The waste to be treated is legacy waste (i.e., waste generated from past isotope production) and research/development that supported national defense and energy initiatives. Waste generated from ongoing ORNL operations of the Facility will also be treated. All treated TRU waste will be transported and disposed of at the WIPP while treated LLW transported and disposed of at NTS.

Facilities Revitalization Project at the Oak Ridge National Laboratory (DOE/EA-1362). This EA is being prepared to evaluate impacts of modernization of the ORNL. The proposed action includes the construction of a number of major new facilities and the renovation of several others over the next five years. The consolidation at the ORNL of Laboratory mission activities currently performed in Y-12 facilities and the associated ORNL personnel is part of the proposed action.

1.4.4 Other Documents

Environmental, Safety, and Health Vulnerabilities Associated with the Storage of Highly Enriched Uranium (DOE/EH-0525, DOE 1996g). This report was issued in December 1996. The related Management Plan (DOE/DP-0139, DOE 1997b) was issued in April 1997. In this report, DOE evaluated 22 sites that handle and store HEU materials in a variety of forms, including disassembled weapons parts, reactor fuels, solids, solutions, and scrap and residues. Most of the HEU vulnerabilities identified at those sites, including Y-12, are associated with poor facility conditions and institutional weaknesses. This document is part of the basis for DOE's initiative to consider the upgrade and/or construction of new facilities and processes at Y-12 to ensure long-term capabilities to support the maintenance of the nuclear weapons stockpile. Proposed action and alternatives in the Y-12 SWEIS for the HEU Materials Facility address the HEU storage vulnerabilities identified at Y-12 facilities.

Report on the Remedial Investigation of the Upper East Fork Poplar Creek Characterization Area at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (DOE/OR/01-1641&D2, DOE 1998b). The Remedial Investigation was issued in August 1998. The Feasibility Study that accompanies the Remedial Investigation was issued in June 1999 (DOE/OR/01-1747&D2, DOE 1999g). A ROD on remediation of the Upper East Fork Poplar Creek (UEFPC) watershed is being prepared and is scheduled to be final in June 2001. The UEFPC characterization area is included in the Y-12 Plant physical study area of analysis for this SWEIS.

Report on the Remedial Investigation of Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (DOE/OR/01-1455&D2, DOE 1997a). The Remedial Investigation was issued in March 1997. The Feasibility Study that accompanies the Remedial Investigation was issued in November 1997 (DOE/OR/02-1525&D2, DOE 1997e). The ROD on remediation of the Bear Creek Valley watershed is being reviewed and should be final in calendar year 2000. A portion of Bear Creek Valley is included as part of the Y-12 Site physical area of analysis in this SWEIS.

Comprehensive Environmental Response, Compensation, and Liability Act Waste Disposal Facility. DOE has published a Remedial Investigation/Feasibility Study for the disposal of ORR CERCLA waste (DOE/OR/02-1637&D2, DOE 1998a). The Proposed Plan (DOE 1999a) and ROD (DOE 1999j) for the Environmental Management Waste Management Facility were issued in January 1999 and November 1999, respectively. The proposed action is on-site disposal at a new facility to be constructed in East Bear Creek Valley bordering the west end of the Y-12 Plant. This project is included in the Y-12 SWEIS No Action - Planning Basis Operations Alternative.

1.5 TIME PERIOD CONSIDERED IN ANALYSIS

The affected environment described in Chapter 4 is based on data for the calendar year 1998. These data, for the most part, were obtained from the *Oak Ridge Reservation Annual Site Environmental Report* (ASER) for 1998 (DOE 1999k). The Y-12 Site (No Action - Planning Basis Operations Alternative) analysis time period used in the SWEIS is 2001 to 2010. For proposed actions involving the Y-12 HEU Storage Mission and Special Materials Mission, the time period considered would be 50 years (i.e., the design life of the facilities). Impacts for construction and operation of new facilities and the operation of Y-12's missions under the No Action - Planning Basis Operations are presented in annual increments unless noted otherwise.

1.6 ISSUE IDENTIFICATION PROCESS

DOE published the NOI to prepare the Y-12 SWEIS in the *Federal Register* on March 17, 1999 (64 FR 13179). Additional public notice of the proposed EIS and the schedule for public scoping meetings were provided through the placement of advertisements in local newspapers. The public scoping period began on that day and continued through May 17, 1999. DOE invited the public to submit comments during the scoping period by postal mail, electronic mail, fax, telephone, and through written and verbal comments submitted at the public scoping meetings.

Both afternoon and evening public scoping meetings were held in Oak Ridge, TN, on April 13, 1999. More than 345 people attended the two scoping meetings held at the Oak Ridge Community Conference Center at the Oak Ridge Mall. At the beginning of each session, a neutral facilitator explained the scoping meeting format. This was followed by a welcome from a representative of the DOE Y-12 Site Office and a brief overview of the NEPA process by the DOE-ORO NEPA Compliance Officer. The DOE SWEIS Document Manager then presented an introduction and background of the Y-12 missions and history, followed by an overview of the Y-12 SWEIS Proposed Action and alternatives. A question and answer session was then held to encourage the public to ask questions to better understand the project before submitting comments.

At the end of the question and answer period, the formal public comment portion of the scoping meeting began and the facilitator invited members of the public to comment on the scope of the SWEIS. A court reporter typed verbatim transcripts of the entire scoping meetings and an audiotape was made of the proceedings. Blank comment forms were available for those members of the public who preferred to provide written comments. Exhibits and handouts about the Y-12 Site, the Y-12 SWEIS, the NEPA process, and the NOI were available at each meeting. Technical representatives were present to answer questions.

DOE public reading rooms in the Oak Ridge area were provided copies of the public notices, written public comments, and the transcripts of the scoping meetings. A database was created to track written and oral comments received during the scoping period. A total of 574 people submitted 701 individual comments that were recorded in the database. The comments were characterized and grouped within 20 major issue categories.

1.7 RESULTS OF PUBLIC SCOPING

DOE's disposition of the issues raised during public scoping for the Y-12 SWEIS was published in the *Scoping Summary Report for the Site-Wide Environmental Impact Statement, Oak Ridge Y-12 Plant* (DOE 1999h) and placed in the Oak Ridge area DOE Reading Rooms at the following locations:

DOE Public Reading Room
230 Warehouse Road
Building 1916-T-2, Suite 300
Oak Ridge, Tennessee 37831

Oak Ridge Public Library
1401 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831

The document can also be viewed on the DOE-ORO Home Page: <http://www.oakridge.doe.gov>.

1.7.1 Major Scoping Comments

DOE has considered all scoping comments in preparing the draft Y-12 SWEIS. The major issues identified by the public centered on the Proposed Action and Alternatives, the Y-12 Site Integrated Modernization (Y-SIM) Program, and the health and safety of workers and the public. The major issues are discussed further in this section and addressed throughout the SWEIS.

Of 701 total comments, 503 related to the SWEIS alternatives (a postcard campaign accounted for 461 of these comments), 67 addressed modernization, and 17 focused on occupational and public health. Of the remaining 114 comments, 62 addressed specific resource areas, while 52 were considered outside of the scope of this SWEIS.

Shutdown of Y-12 Plant. Some commentators opposed continuation of operations at the Y-12 Plant associated with weapons production. Several individuals stated that the production of nuclear weapons and materials should be halted immediately. Public health and safety related to Y-12 weapons production activities were also areas of concern.

The decision to continue the weapons production mission at Y-12 has already been made by DOE in the SSM PEIS ROD. Shutting down Y-12 is not a viable alternative at this time (see Section 3.4). The need for nuclear weapons has already been determined by the President and Congress, and is an issue that is beyond the scope of the Y-12 SWEIS. The impacts on worker and public health and safety from Y-12 operations are included and analyzed in Chapter 5 of this SWEIS.

Proposed Action and Alternatives. Commentors expressed a variety of opinions and preferences on the alternatives addressed in the SWEIS. Comments focused on which alternatives should be implemented in modernizing the Y-12 Plant and the preferred alternative that should be selected by DOE.

Commentors expressed confusion as to the exact definition of No Action and how the SWEIS would analyze this alternative. Some commentors stated that a total halt to weapons production at Y-12 and shutdown of the facility should be considered as the No Action Alternative. Other commentors stated that the No Action Alternative was not a viable alternative as indicated in the NOI because the Y-12 Plant was needed to support the Nation's Nuclear Weapon Stockpile. However, all the commentors were aware of and noted that NEPA regulations require analysis of a No Action Alternative.

Some commentors stated that the Y-12 mission could be accomplished solely with consolidation and upgrade of existing facilities as analyzed in the SSM PEIS. Others stated that DOE should pursue the total modernization of the Y-12 Plant by all new construction should be pursued by DOE. A large number of

comments were received through a postcard campaign that supported the modernization of the Y-12 Plant by using a combination of upgrades to existing facilities and construction of new facilities as appropriate. Commentors wanted specific buildings identified that would be upgraded or vacated due to construction, even if they were tentative designations.

DOE has considered all comments on alternatives for the Y-12 SWEIS and has addressed the major comments described above in the following manner.

Shutting down the Y-12 Plant is not a viable alternative as explained in the NOI on March 17, 1999 (64 FR 13179). DOE has already decided in the SSM PEIS and S&D PEIS RODs that the mission at Y-12 would not continue (see Section 3.4). Therefore, the No Action - Planning Basis Operations Alternative analyzed in this SWEIS addresses the continuation of Y-12 historic missions. The No Action - Planning Basis Operations Alternative reflects the Y-12 Plant operations at planned weapons production support levels (see Section 3.2.2). A No Action - Status Quo Alternative, which is basically the status of the Y-12 in 1998, is also presented in the SWEIS to show the potential increase in production levels and potential impacts under the No Action - Planning Basis Operations Alternative and action alternatives. The No Action - Status Quo Alternative does not meet Y-12 mission requirements and is not considered reasonable because most Y-12 Plant operations were not operating in 1998 as a result of the 1994 stand-down of Y-12.

The Y-12 Plant consolidation efforts analyzed in the SSM PEIS are included in the Stockpile Management Restructuring Initiative (see Section 1.1.2) which implements the plan for downsizing the Y-12 Plant. The potential impacts of consolidation and limited upgrade are included under the No Action - Planning Basis Operations Alternative (see Section 3.2.2.1), consistent with the SSM PEIS ROD. Because of the age of Y-12 facilities, new requirements for natural phenomena and worker health standards, and limited budgets, upgrade alone is not considered a reasonable approach to continue the Y-12 Plant mission and meet long-term workload requirements.

Construction of an all new Y-12 Plant is not considered an alternative in the SWEIS. The Y-SIM Program, which is the foundation for an all new Y-12 Plant proposal, is a long-term process and most projects are not developed to the extent that they can be proposed and analyzed under NEPA at this time. However, new construction alternatives to support the Y-12 Plant HEU Storage Mission and the Special Materials Mission are included in the SWEIS (see Section 3.2.3 and 3.2.4). DOE's preferred alternative for the HEU Storage Mission is to construct and operate a new HEU Materials Facility. The preferred alternative for the Special Materials Mission at Y-12 is to construct and operate the new Special Materials Complex. A preferred site for these facilities will be identified in the Final Y-12 SWEIS.

Y-12 Site Integrated Modernization Program. Many commentors expressed concern about the advanced age of the Y-12 facilities, because many of the buildings are more than 40 years old. These commentors stated that the facilities should be modernized to reduce operating costs and to enhance health, safety, and environmental requirements. Some commentors expressed concern about the potential budget impacts of modernization on EM activities and pointed out that it is more difficult to assign a cost to such things as environmental issues and health and safety.

It also was the opinion of many commentors that modernization of Y-12 should not be delayed and should be conducted in an integrated way. Alternatively, one commentor opposed any modernization of nuclear processes and facilities and suggested several sub-alternatives for modernization and consolidation for those activities associated only with dismantling weapons and processing and storage of HEU.

As explained in Section 1.1.2, the Y-SIM Program is a long-term process designed to modernize the Y-12 Plant in an integrated way so as not to disrupt the assigned weapons mission support activities or jeopardize the Y-12 weapons production capabilities. The parts of modernization that can be analyzed at this time are included in the SWEIS (i.e., the HEU Storage Mission Alternatives and the Special Materials Mission Alternatives)(see Section 3.2.3 and 3.2.4). The potential future modernization projects, such as the Enriched Uranium Manufacturing Facility are described in Section 3.3 of the SWEIS, but are not analyzed as proposed projects in the SWEIS. All modernization projects, as well as EM activities, are subject to congressional budget appropriations and changes.

Alternatives that eliminate components of the mission at Y-12 (i.e., weapons production and support activities) are not viable alternatives since they would not continue the current Y-12 mission, nor would such alternatives be consistent with the SSM PEIS ROD (see Section 3.4).

Worker and Public Health and Safety. Comments related to worker and public health and safety stated that the SWEIS should address enriched uranium, beryllium, and other radiological and hazardous materials. This included the request that the SWEIS discuss analysis of off-site exposure to uranium-contaminated dust, potential hazard to workers due to external gamma and possible criticality reactions from storage of enriched uranium, and a chronic beryllium disease management plan.

The SWEIS analyzes potential worker and public health impacts associated with criteria pollutants, hazardous air pollutants and radiological air pollutants in Section 5.12 of this SWEIS. Criticality accidents are addressed in Section 5.14 and Appendix D of this SWEIS. Appendix D.6 presents summaries on past or ongoing beryllium studies associated with Y-12 workers and the public.

1.8 ORGANIZATION OF THIS SITE-WIDE ENVIRONMENTAL IMPACT STATEMENT

This Y-12 SWEIS consists of three volumes; the Summary, Volume I, which contains the main text, and Volume II, which contains technical appendixes that support the analyses in Volume I and additional project information.

Volume I, contains 12 chapters, which include the following information:

Chapter 1 - Introduction. A background of DP activities at Y-12 in support of national security programs, and the NEPA process.

Chapter 2 - Purpose of and Need for DOE Action. Reasons why DOE needs to take action and the objectives DOE proposes to achieve.

Chapter 3 - Description of Alternatives. How DOE proposes to meet the specified need and achieve the objective. The chapter also includes a summary comparison of the potential environmental impacts of the SWEIS alternatives.

Chapter 4 - Affected Environment. Aspects of the environment (i.e., natural, built, and social) that might be affected by the SWEIS alternatives.

Chapter 5 - Environmental Consequences. Analyses of the potential impacts on the human environment. Impacts from activities that are expected to support Y-12 Site missions (the No Action - Planning Basis Operations Alternative) as well as potential impacts from proposed new facilities and alternatives compared

to the No Action - Status Quo Alternative. The chapter also includes resource commitments, unavoidable adverse impacts, short-term uses versus long-term productivity, and irreversible or irretrievable resource commitments.

Chapter 6 - Cumulative Impacts. Contains the discussion of cumulative impacts resulting from the proposed action and alternatives when added to past, present, and reasonably foreseeable actions in the SWEIS study area.

Chapter 7 - Statutes, Regulations, Consultations, and Other Requirements. Environmental, safety, and health regulations that would apply to the SWEIS alternatives and agencies consulted for their expertise.

Chapters 8 through 12 - A List of Preparers and Contributors, an Index, a list of references used in preparing the SWEIS, a Glossary, and a list of persons and agencies to whom copies of this SWEIS were sent.

Volume II contains three appendixes of technical information and supporting data for the environmental analyses presented in Volume I. The remaining appendixes in Volume II consist of a copy of the NOI for the SWEIS, consultation letters, and contractor disclosure statements.