

# CHAPTER 1: INTRODUCTION AND PURPOSE AND NEED FOR ACTION

*Chapter 1 presents an overview of this Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (Y-12 SWEIS), including the relevant history and SWEIS scope. The Chapter also discusses the purpose and need for agency action and the national security considerations that are involved in developing this SWEIS. Next, the Chapter describes related National Environmental Policy Act (NEPA) documents. The chapter concludes with an overview of the public involvement process, including a discussion of the comments that were received during the public scoping period and the public review of the Draft Y-12 SWEIS.*

## 1.0 INTRODUCTION

The National Nuclear Security Administration (NNSA), a separately organized agency within the U.S. Department of Energy (DOE), is the federal agency responsible for maintaining and enhancing the safety, security, reliability, and performance of the U.S. nuclear weapons stockpile. This *Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (Y-12 SWEIS)* analyzes the potential environmental impacts of ongoing and future operations and activities at the Y-12 National Security Complex (Y-12), including alternatives for changes to site infrastructure and levels of operation (using production capacity as the key metric for comparison). The primary purpose of continuing to operate Y-12 is to provide support for NNSA’s national security missions.

Y-12 is one of three primary installations on the DOE Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee (Figure 1-1). 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 started in 1943 as part of the World War II Manhattan Project. The early missions of the site included the separation of uranium-235 from natural uranium<sup>1</sup> by the electromagnetic separation process and the manufacture of nuclear weapons components from uranium and lithium. Today, as one of the NNSA production facilities, Y-12 is the primary site for enriched uranium (EU) processing and storage, and one of the primary manufacturing facilities for maintaining the U.S. nuclear weapons stockpile. Y-12 is unique in that it is the only source of **secondaries**,<sup>2</sup> **cases**, and other nuclear weapons components within the NNSA nuclear security enterprise.<sup>3</sup> Y-12 also dismantles nuclear weapons components, safely and

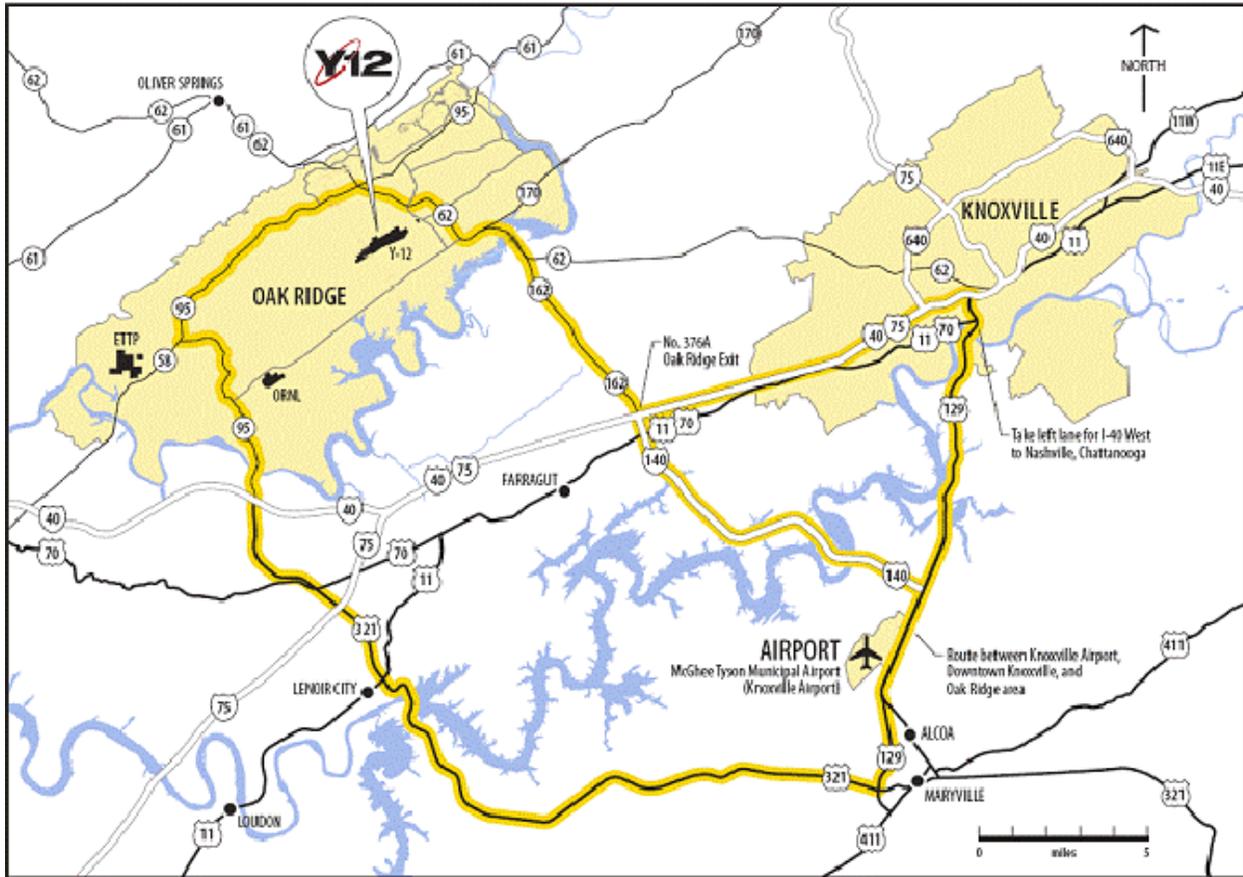
### Secondaries and Cases

A secondary is a component of a nuclear weapon that contains the technology and materials needed to initiate the fusion reaction in a thermonuclear explosion. A case contains the secondary and other components.

<sup>1</sup> Natural uranium is a mixture of uranium-238 (99.2739 percent), uranium-235 (0.7205 percent) and uranium-234 (0.0056 percent).

<sup>2</sup> Text boxes provide additional information on terms that are bold-faced.

<sup>3</sup> “Nuclear security enterprise” is a relatively new term that refers to the NNSA complex in its entirety. In the past, NNSA used the term “nuclear weapons complex.” NNSA believes that “nuclear security enterprise” more accurately describes its basic mission as a “nuclear security” organization that addresses a broad range of nuclear security items (the stockpile, nuclear nonproliferation, nuclear counter-terrorism, incident response, emergency management, etc.).



Source: YSO 2010b.

**Figure 1-1. Location of Oak Ridge Reservation, Principal Facilities, and Surrounding Area.**

securely stores and manages special nuclear material (SNM)<sup>4</sup>, supplies SNM for use in naval and research reactors, and disposes surplus materials. Y-12 nuclear nonproliferation programs play a critical role in securing our nation and the globe and combating the spread of weapons of mass destruction by removing, securing, and dispositioning SNM, and down-blending weapons-grade materials to non-weapons forms suitable for use in commercial reactors.

Y-12 conducts and/or supports nondefense-related activities including environmental monitoring, remediation, and decontamination and decommissioning (D&D) activities of the DOE Environmental Management (EM) Program; manages waste materials from past and current operations; supports the production of medical isotopes; and develops highly specialized technologies to support the capabilities of the U.S. industrial base.

<sup>4</sup> As defined in Section 11 of the *Atomic Energy Act of 1954* (Pub. Law 83-703), the term SNM means: (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Nuclear Regulatory Commission determines to be SNM, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

This chapter provides background information on Y-12, describes the scope of this SWEIS, explains the purpose and need for agency action, discusses Y-12's past *National Environmental Policy Act* (NEPA) (42 *United States Code* [U.S.C.] §4321 et seq.) activities, and addresses the scoping comments received during the scoping period. Chapter 2 provides an overview of Y-12 missions, operations, programs, and facilities. Chapter 3 discusses the alternatives considered in this SWEIS. Chapter 4 describes the existing environment. Chapter 5 identifies the environmental consequences of the alternatives. The remaining chapters and appendices provide additional details on the information in Chapters 1 through 5.

***National Environmental Policy Act***

NEPA requires the preparation of an environmental impact statement for every major federal action that may significantly affect the quality of the human environment. NEPA's main purpose is to provide environmental information to decisionmakers and the public so that actions are based on an understanding of the potential environmental consequences of a proposed action and its reasonable alternatives.

**1.1 BACKGROUND**

In the mid-1990s, DOE prepared several Programmatic EISs (PEISs) to inform decisionmakers and the public of the potential environmental impacts of alternatives for carrying out its national security missions (see Section 1.7.1 for a discussion of those PEISs and their relevance to this Y-12 SWEIS). DOE then made a number of decisions related to the nuclear security enterprise operations at Y-12 and the long-term storage and disposition of fissile material.<sup>5</sup> Specifically, DOE decided that the mission of Y-12 would not change (i.e., Y-12 would continue to maintain the capability and capacity to fabricate nuclear weapons secondaries, cases, and limited-life components in support of the nuclear weapons stockpile, and store/process nonsurplus, highly enriched uranium (HEU) long-term and surplus HEU pending disposition). See Section 1.7.1 for a discussion of these previous PEISs.

Following the PEIS decisions, DOE/NNSA prepared the 2001 Y-12 SWEIS (DOE 2001a) to evaluate alternatives for implementing the PEIS decisions. The Final Y-12 SWEIS, issued in September 2001, evaluated alternatives related to the operation of Y-12 for an approximate 10-year planning period. One of the primary goals of the 2001 Y-12 SWEIS was to provide an overall NEPA baseline for all DOE activities at Y-12, including an assessment of a Y-12 Modernization Program consistent with previous programmatic decisions. The purpose of the Modernization Program (see Section 1.2) is to develop and implement a program to modernize Y-12's facilities to meet future stockpile needs.

In the 2001 Y-12 SWEIS, NNSA recognized and acknowledged that the Modernization Program would be implemented over a number of years so as not to interfere with Y-12 meeting required and planned mission activities. Although many potential modernization projects were identified in the 2001 Y-12 SWEIS, only two projects had reached the stage of development to have been included as proposals in that SWEIS. Alternatives for those two projects, the Highly Enriched Uranium Materials Facility (HEUMF) and the Special Materials Complex (SMC), were analyzed in the 2001 Y-12 SWEIS.

<sup>5</sup> Fissile materials are plutonium-239, uranium-233, uranium-235, or any material containing any of the foregoing.

In the 2002 Record of Decision (ROD) for the 2001 Y-12 SWEIS (67 *Federal Register* [FR] 11296, March 13, 2002), NNSA announced its decision to continue operations at Y-12 and to construct and operate two new facilities: (1) the HEUMF and (2) the SMC. Construction of the HEUMF was completed in 2008 and the facility began full-scale operations in 2010. In addition to being a significant contribution to modernization at Y-12, the 110,000 square-foot HEUMF will reduce the current storage footprint (by phasing out excess facilities), while improving security and lowering costs. The SMC was subsequently cancelled due to changing mission requirements and replaced by a smaller, single-function Purification Facility (*Supplement Analysis for Purification Facility, Site-Wide Environmental Impact Statement for the Y-12 National Security Complex*, DOE/EIS-0309/SA-1, August 2002 [NNSA 2002]), and the installation of new equipment in existing facilities.

Most recently, NNSA prepared the *Complex Transformation Supplemental PEIS* (SPEIS) (DOE/EIS-0236-S4) (NNSA 2008) to analyze potential environmental impacts of alternatives for transforming the nuclear security enterprise into a smaller, more efficient enterprise. (See Section 1.7.1 for a more detailed discussion of that SPEIS and its relevance to this Y-12 SWEIS.) In the ROD for that SPEIS, NNSA affirmed that manufacturing and research and development (R&D) involving uranium will remain at Y-12 (73 FR 77644, December 19, 2008). NNSA also announced that it will construct and operate a Uranium Processing Facility (UPF) at Y-12 as a replacement for existing facilities that are more than 50 years old and face significant safety and maintenance challenges to their continued operation. The NNSA committed to evaluating the site-specific issues associated with continued production operations at Y-12 in this SWEIS, including issues related to construction and operation of a UPF, such as its location<sup>6</sup> and size. In this new Y-12 SWEIS, NNSA continues to assess alternatives for the modernization of Y-12, including implementation of the Complex Transformation SPEIS decisions.

## 1.2 Y-12 TODAY AND THE VISION FOR TOMORROW

Over the past 10-15 years, Y-12 has been taking steps to modernize and transform its Cold War-era site and facilities into a modern, more cost-effective enterprise. Modernization and transformation envisions the eventual replacement or upgrade of select major production and support facilities with the goal to 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; and
- Reducing costs and improving operating efficiencies.

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<sup>6</sup> As described in Section 3.2.2 and shown in Figure 3.2.2-2, the proposed UPF would be located adjacent to the HEUMF, at a site just west of the HEUMF. In the 2001 Y-12 SWEIS, DOE evaluated alternative locations for the HEUMF, and in the 2002 ROD DOE decided to construct the HEUMF at the Y-12 West Portal Parking Lot Site (67 FR 11296, March 13, 2002). Construction of the HEUMF was initiated in 2005 and completed in 2008. The facility began full-scale operations in 2010. Locating a UPF adjacent to the HEUMF is consistent with the analysis performed in support of the 2001 Y-12 SWEIS, the Complex Transformation SPEIS, RODs based on these documents, and Y-12 modernization plans. Siting a UPF at a location other than adjacent to the HEUMF would not allow for certain operational efficiencies and reduced security footprint.

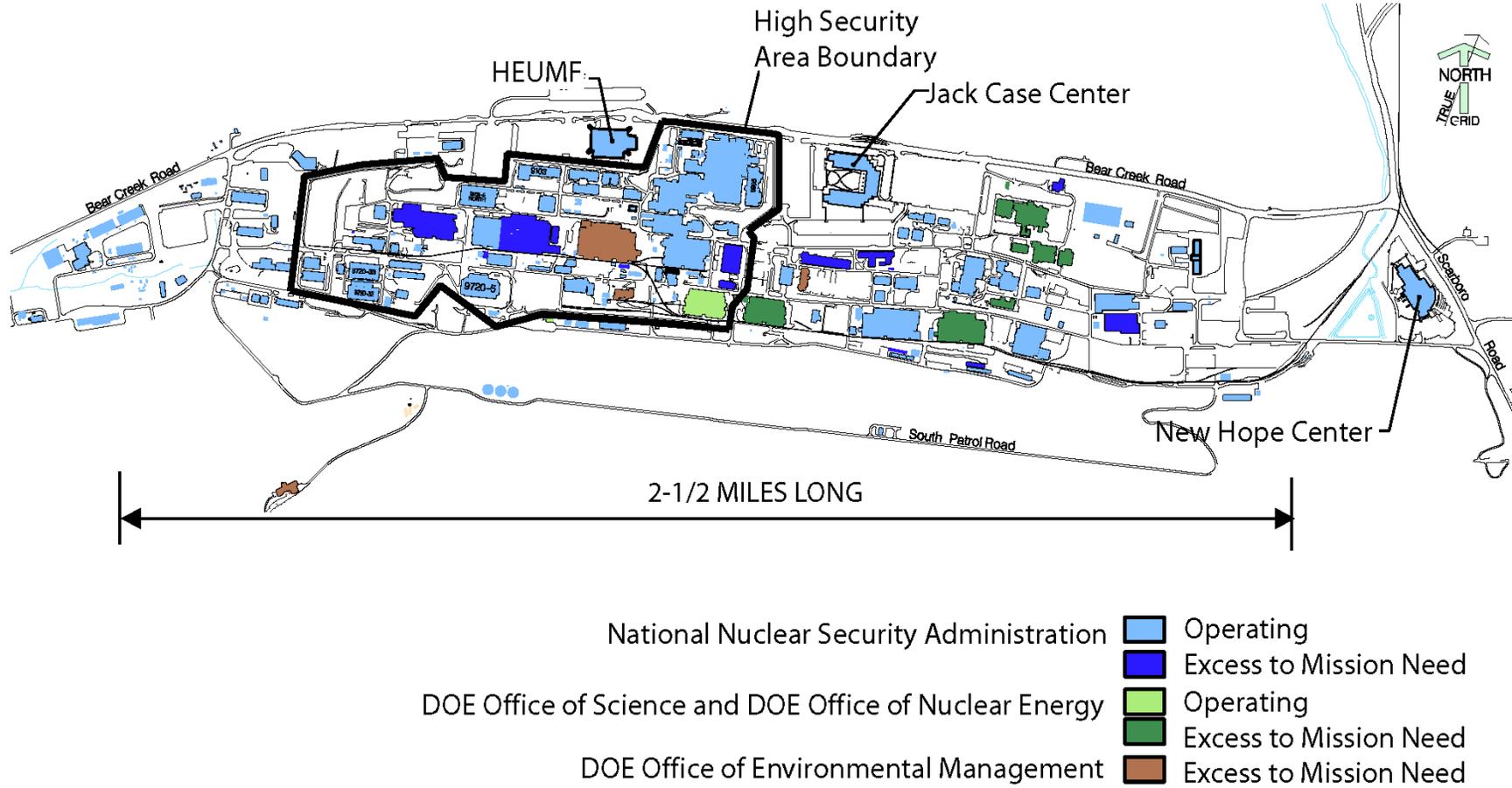
To date, the following important actions have been completed:

- Construction of the HEUMF, Y-12's first major EU modernization project, was completed in 2008 and full operations began in 2010.
- Construction of two new technical/administrative facilities was completed in 2007. The Jack Case Center and the New Hope Center now house over 1,400 employees from Babcock & Wilcox Technical Services Y-12, LLC (B&W Y-12), the Management and Operating contractor for Y-12, and the NNSA Y-12 Site Office. Construction of these facilities enabled the demolition of a number of excess facilities and the cancellation of several offsite leases.
- Y-12 has continued an aggressive Infrastructure Reduction program. Since 2002, Y-12 has demolished approximately 1.3 million square feet of floor space (NNSA 2008a).

Currently, the Y-12 workforce consists of approximately 6,500 people (DOE employees and multiple contractors and subcontractors) operating approximately 393 facilities with approximately 5.8 million square feet of NNSA-owned space and leased space. This represents 75 percent of the total Y-12 site footprint (NNSA 2008a). Other DOE program offices have ownership of the remaining facilities at Y-12. Figure 1.2-1 depicts the major operational facilities currently supporting the Y-12 missions, which are described in Chapter 2. As shown in that figure, there are numerous facilities located within an approximately 150-acre, high-security area.

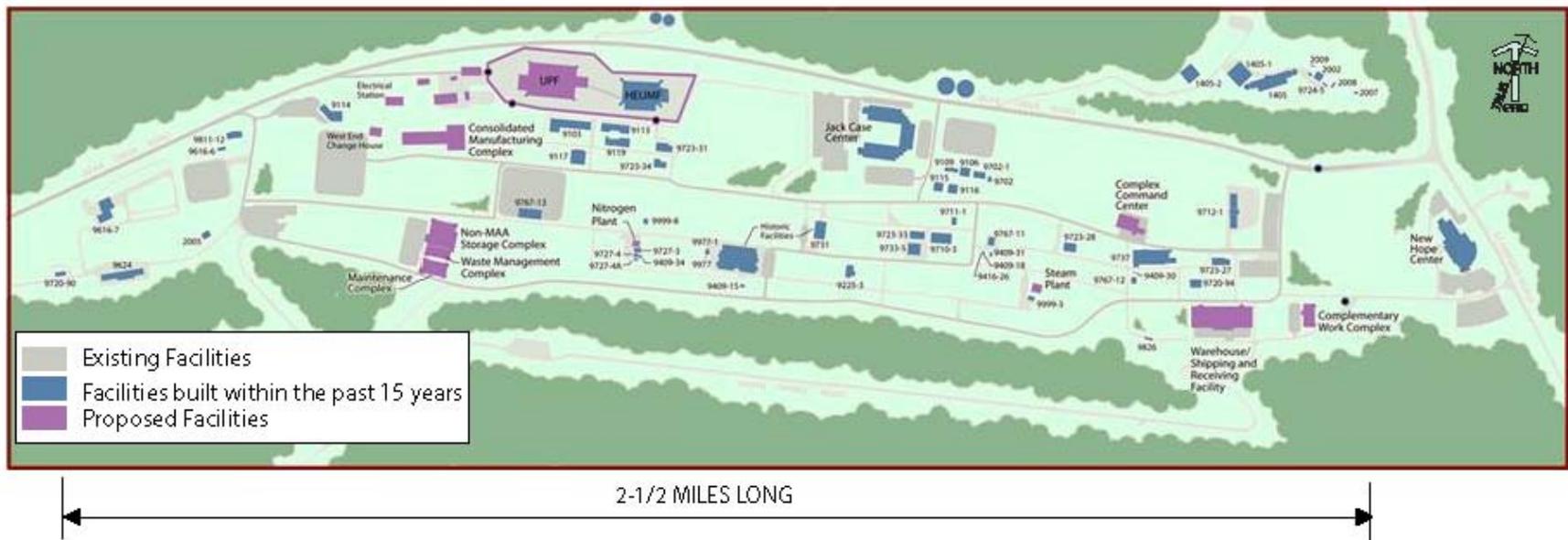
While important modernization activities have already been accomplished, the overall vision will continue to be a work in progress. The NNSA has developed a long-range plan, updated periodically, that reflects the Y-12 modernization goals. The most recent plan, dated August 2008, is referred to as the Ten-Year Site Plan (TYSP) for 2009-2018 (NNSA 2008a). The TYSP describes the missions, workload, technology, workforce, and corresponding facilities and infrastructure investment and management practices for Y-12. The TYSP also includes a long-term vision of the proposed infrastructure changes at Y-12 over the next 20 years (see Figure 1.2-2). That vision presents a layout of the major operational facilities that would be required to support future national security missions at Y-12. To fully appreciate the proposed end-state envisioned, comparing Figure 1.2-1 against Figure 1.2-2 provides a view of the amount of consolidation and elimination of excess facilities envisioned. As can be seen, Y-12 would look significantly different in the future than it looks today. By then, Y-12 would have significantly fewer facilities and floorspace, and significantly more open space.

From a land-use planning perspective, NNSA envisions a site that would ultimately consist of three functional zones (Production Operations, Technical Support Operations, and Site Support Operations) with significant areas of open space. The three zones are described below. The overall configuration is indicative of a modernization-in-place, or brownfield, approach to redevelopment. The approach must incorporate realistic funding for new facilities and for the D&D of excess facilities that render areas of the plant usable for redevelopment within the zones while at the same time continuing to operate the existing plant. For these reasons, while the facility footprint of Y-12 would decrease, the land area requirement would likely remain in support of safeguards and security requirements (NNSA 2008a).



Source: NNSA 2008a.

**Figure 1.2-1. Major Operating Facilities Currently Supporting Y-12 Missions.**



Source: NNSA 2008a, modified.

**Figure 1.2-2. The Proposed End State for the Modernization of Y-12.**

The vision has incorporated the disposition of all buildings that would no longer be required to support the Y-12 missions. The total site footprint is envisioned to be around 3 million square feet. While the locations of some buildings are shown on Figure 1.2-2, it should be noted that some future facilities would be subject to change as more detailed master planning matures over time.

**Production Operations.** This zone would be dominated by the consolidation of all EU operations into HEUMF and the UPF (currently in preliminary design, and analyzed in this SWEIS for siting, construction, and operation). By consolidating all EU into these two facilities, the high security area that now consists of approximately 150 acres could ultimately be reduced to about 15 acres—significantly reducing security costs. With the use of advanced security surveillance systems and a smaller security area, the EU protective force will be reduced by 40–60 percent. The first phase of this consolidation is complete with the operation of the HEUMF. The second facility, UPF, is addressed in this SWEIS. The production operations zone would also include a facility to consolidate lithium, depleted uranium (DU), special materials, and general manufacturing operations. Currently, these operations are dispersed in several Manhattan Project–era and/or pre-1960 facilities. While some facility upgrades, minor consolidations, and maintenance of these facilities would continue in the short term, NNSA envisions that a small facility, or possibly a Consolidated Manufacturing Complex (CMC), could be designed and engineered to consolidate these various operations.

**Technical Support Operations.** This zone is dominated by the Jack Case Center (an office building completed in 2007) and several other existing structures. Today, this zone has over 20 major facilities, many of which are Manhattan Project–era structures not designed for their current use as office buildings. Transformation envisions a zone that will contain the Jack Case Center and retain several of the more permanently constructed buildings such as 9106, 9109, 9115, 9116, 9710-3, and 9733-5. The Jack Case Center, a leased facility, houses over 1,000 people. Ongoing site planning activities are evaluating additional facilities in this zone, possibly through private sector investment. These include an R&D Center, Plant Laboratory, Maintenance Facility, and Warehouse.

**Site Support Operations.** These zones, located in the eastern and western portions of the existing Y-12 site, would contain various site support functions such as materials management, vehicle maintenance, fire station, and emergency management operations. Also included in this area of the complex is New Hope Center, completed in 2007. This facility contains functions that do not require a higher security level, such as information technology, the Y-12 visitor center, conference and training facilities, light laboratories, and offices. A new steam plant, funded by the Facilities and Infrastructure Recapitalization Program (FIRP), was constructed in this area and became operational in June 2010. Another FIRP-funded project, the Potable Water System Upgrades project, became operational in September 2010. The western site support operations zone also houses several onsite waste management facilities, including the West End Treatment Facility, tank farms, and tanker terminal. This land would continue to be used to support Y-12 operations and cleanup actions.

Approximately 3.1 million square feet of facilities would be eliminated if the proposed end-state is achieved. NNSA has established the following site-specific goals for Y-12 over the next approximately 20 years:

- 90 percent reduction in the high security area;
- 60 percent reduction in the nuclear operations footprint; and
- 50 percent reduction in the total building footprint (an approximate 3.1 million square foot reduction) (NNSA 2008a).

As implied by the site vision, over the next approximately 20 years there would be a significant amount of open space generated as a result of legacy facility and material disposition and site cleanup over time. Although this land area would provide, as some of it does today, potential reuse or reindustrialization opportunities to support future programs, any such changes are currently not reasonably foreseeable.

Because of the long-term nature of modernization and transformation, not all of the facilities/actions envisioned in the TYSP are analyzed within the alternatives considered in this SWEIS. This is due to the fact that not all of the facilities/actions are ripe for analysis. Some of these buildings are concept facilities with no established funding. Such potential future projects are described in Section 3.3 (Potential Future Y-12 Modernization Projects). These future projects are also considered, based on current information, in the cumulative impacts chapter of this SWEIS (see Chapter 6). Further NEPA review would be required if these facilities are formally proposed and ripe for decision.

Additionally, some actions envisioned by the TYSP are not analyzed as proposals in this SWEIS because they are either addressed by other regulatory actions or have been analyzed in other NEPA documents. The Integrated Facilities Disposition Program (IFDP) is one such example. The IFDP includes both existing excess facilities and newly identified excess (or soon to be excess) facilities. The IFDP is a strategic program for disposing of legacy materials and facilities at ORNL and Y-12 using an integrated approach that results in risk reduction, eliminates \$70 million to \$90 million per year in cost of operations, provides surveillance and maintenance of excess facilities, and management of other legacy conditions. Under the IFDP, the D&D of approximately 188 facilities at ORNL, 112 facilities at Y-12, and remediation of soil and groundwater contamination would occur over the next 30-40 years. The IFDP will be conducted as a remedial action under the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) (see Sections 2.2.2.3 and 2.2.2.4). Cleanup and D&D activities conducted under CERCLA are reviewed through the CERCLA process. (Section 1.4 discusses the scope of this SWEIS and the alternatives addressed.)

### 1.3 PURPOSE AND NEED

The continued operation of Y-12 is critical to NNSA's **Stockpile Stewardship Program** and Nuclear Nonproliferation Programs. Y-12 is unique in that it is the only source of secondaries, cases, and other nuclear weapons components within the NNSA nuclear security enterprise. Y-12 also dismantles nuclear weapons components, safely and securely stores and manages SNM, supplies SNM for use in naval and research reactors, and dispositions surplus materials. Y-12's nuclear nonproliferation programs play a critical role in combating the spread of weapons of mass destruction. As explained in Section 1.5, the Y-12 missions are consistent with, and supportive of, national security policies and international treaties.

Continued operation of Y-12 is made more difficult by the fact that most of the facilities at Y-12 are old, oversized, and inefficient. Continued long-range reliance on World War II-era facilities designed for enrichment, and on support facilities built to be temporary in some cases, would not meet NNSA's responsive infrastructure requirements, would not provide the level of security and safeguards required for the future, and would become more and more costly to operate. More than 70 percent of all the floor space at Y-12 was constructed prior to 1950 as part of the Manhattan Project. The total operating space estimated to perform the future NNSA missions and functions at Y-12 is significantly less than the current operating space. NNSA estimates that the future NNSA footprint would be approximately 2.2 million square feet of space versus the 5.3 million square feet utilized today.<sup>7</sup> These old and oversized facilities are costly to maintain and have no inherent value for future missions. Modernizing this old, over-sized, and inefficient infrastructure is a key strategic goal of Y-12 and is consistent with NNSA strategic planning initiatives and prior programmatic NEPA documents (NNSA 2007, NNSA 2008, NNSA 2008a).

The existing EU operations require significant funding to address security, facility, and process equipment aging and other infrastructure issues. For example, existing EU operations are decentralized in several buildings that are not connected and require many inefficient transports of SNM. The resulting protected area within the **Perimeter Intrusion Detection and Assessment System (PIDAS)** is large, and operating costs are not optimized. Over time, an elaborate system of administrative controls has been put in place to adequately manage environmental compliance, worker safety, criticality safety, fire protection,

#### Purpose and Need

The purpose and need for NNSA action is to support the Stockpile Stewardship Program and to meet the missions assigned to Y-12 in the Complex Transformation SPEIS ROD efficiently and safely.

#### Stockpile Stewardship Program

The Stockpile Stewardship Program is designed to ensure the safety and reliability of the U.S. nuclear weapons stockpile without underground testing by using the appropriate balance of surveillance, experiments, and simulations.

#### Perimeter Intrusion Detection and Assessment System (PIDAS)

A PIDAS is a combination of barriers, clear zones, lighting, and electronic intrusion detection, assessment, and access control systems constituting the perimeter of the Protected Area and designed to detect, impede, control, or deny access to the Protected Area.

<sup>7</sup> The 5.3 million square feet figure does not include approximately 550,000 square feet associated with the Jack Case and New Hope Centers which were completed in July 2007 and are leased by B&W Y-12. The 2.2 million square feet figure includes the approximately 550,000 square feet associated with the Jack Case and New Hope Centers.

and security. The maintenance of these administrative controls requires an increasingly large number of personnel to ensure compliance in operations. Maintaining effective safeguards and security posture for materials and processes in this patchwork of facilities is increasingly costly during a time when security threats are increasing (B&W 2007).

The current SNM facilities at Y-12 have physical protection challenges with the amount and nature of material and the number and location of storage and operations areas. In addition, the physical infrastructure is a sprawling industrial complex with many facilities located at less than the optimal distance to employee access roads. With SNM facilities dispersed within the site, the existing Protected Area is large and needlessly encompasses most non-SNM production operations. With the new graded security protection policy, existing SNM facilities are very labor intensive to secure (B&W 2005b).

In this SWEIS, NNSA is considering alternatives that would support decisions regarding the modernization of Y-12. The goals and objectives of modernizing Y-12 are to accomplish the following:

- Improve the level of security and safeguards;
- Replace/upgrade end-of-life facilities and ensure a reliable EU processing capability to meet the mission of NNSA;
- Improve efficiency of operations and reduce operating costs by consolidating and modernizing equipment and operation;
- Reduce the size of the Protected Area by 90 percent and reduce the operational cost necessary to meet the security requirements;
- Improve worker protection with an emphasis on incorporating engineered controls; and
- Comply with modern building codes and environment, safety, and health (ES&H) standards (B&W 2007).

#### **1.4 SCOPE OF THIS Y-12 SWEIS AND ALTERNATIVES**

This new Y-12 SWEIS expands on and updates the analyses in the 2001 Y-12 SWEIS, and includes alternatives for proposed new actions and changes since the 2002 Y-12 SWEIS ROD (see Chapter 3 for a more detailed discussion of these alternatives). The No Action Alternative for this SWEIS is the continued implementation of the 2002 ROD, as modified by decisions made following analysis in subsequent NEPA reviews.

Four action alternatives are considered in this SWEIS in addition to the No Action Alternative. The four alternatives differ in that: Alternative 2 involves a new, fully modernized manufacturing facility (the UPF) optimized for safety, security, and efficiency; Alternative 3 involves upgrading the existing facilities to attain the highest level of safety, security and efficiency possible without constructing new facilities; and Alternatives 4 and 5 involve a reduction in the production capacity of Y-12 to support smaller stockpile requirements. Alternatives 2–5 also include the construction and operation of a new Complex Command Center (CCC). The alternatives are described in detail in Chapter 3 and summarized below.

### 1.4.1 Alternative 1 – No Action Alternative

The No Action Alternative reflects the current nuclear weapons program missions at Y-12 and includes the manufacture and assembly/disassembly of nuclear weapons components, the continued processing and storage of enriched uranium materials, the operation of the HEUMF and Purification Facility, disposition of excess materials, and Infrastructure Reduction, which will remove excess buildings and infrastructure. Construction of a UPF is not part of the No Action Alternative. The No Action Alternative would be capable of supporting a production level of approximately 125 secondaries and cases per year.<sup>8</sup> As part of the No Action Alternative, other construction projects are also underway or planned for the future. Some are refurbishments or upgrades to plant systems, such as those for potable water, which have been analyzed in separate NEPA documentation. Section 1.7.2 identifies and describes these projects in more detail. The No Action Alternative also includes continued operations related to other National Security Programs, such as Nonproliferation, Global Threat Reduction Initiatives, and support to Naval Reactors (see Chapter 2). Additionally, there are many non-NNSA programs at Y-12 that would continue under the No Action Alternative. Chapter 2 describes these programs. Much of the program work at Y-12, including dismantlement, storage, surveillance, nonproliferation, naval reactors, and work for others would be essentially the same for all five alternatives. As presented in Sections 1.4.2 through 1.4.6, the action alternatives differ in the throughput capacities (of secondaries and cases) that could be supported, as well as whether to perform EU operations in upgraded facilities or a new UPF.

### 1.4.2 Alternative 2 – Uranium Processing Facility Alternative

Under this alternative, NNSA would implement all actions in the No Action Alternative, and construct and operate a modern UPF and a new CCC. This alternative also includes continued operations related to other National Security Programs, such as Nonproliferation, Global Threat Reduction Initiatives, and support to Naval Reactors (see Chapter 2). Additionally, there are many non-NNSA programs at Y-12 that would also continue under this alternative. Chapter 2 describes these programs. This alternative is referred to as the “UPF Alternative” throughout this SWEIS. The UPF Alternative would be capable of supporting a production level of approximately 125 secondaries and cases per year.

#### UPF Project

The UPF would improve security and safety, reduce costs, and ensure that Y-12 maintains the capability to meet national security requirements for the foreseeable future.

### Uranium Processing Facility

The UPF would consolidate EU operations into an integrated manufacturing operation, sized to provide flexibility in supporting programmatic needs. The UPF is proposed to be sited adjacent

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<sup>8</sup> In order to provide a consistent analysis of the impacts among alternatives, the analyses presented in the SWEIS were performed using an assumed production level of 125 secondaries and cases per year for each of the Alternatives 1, 2, and 3. It should be noted that the environmental impacts associated with the production of secondaries varies based on the systems being produced or the actual work content of refurbished systems. The 125 production level analyzed in the SWEIS is representative of more difficult systems that have been produced in the past or could be produced in the future. As documented in the Stockpile Stewardship and Management Plan issued in May 2010 (NNSA 2010a), NNSA has also recently evaluated the capacity of the existing production buildings for less difficult systems and has determined that for those systems the maximum capacity is approximately 160 secondaries and cases per year. The environmental impacts associated with the production of these units would be bounded by the analysis for the 125 difficult systems analyzed in the SWEIS.

to the HEUMF to allow the two facilities to function as one integrated operation. Transition of EU production operations to the UPF (Alternative 2) and transition of EU storage operations into HEUMF (No Action Alternative) would enable the creation of a new high-security area 90 percent smaller than the current high security protected area. Operations to be consolidated in the UPF are currently located in multiple facilities. After startup of UPF operations some of these facilities could be used to consolidate non-EU operations already existing in those facilities and others would undergo D&D.

The UPF Alternative (Alternative 2), which would involve a major capital investment, was developed to continue with modernization efforts to correct the deficiencies described in Section 1.3. For example, the UPF, if constructed, would consolidate current and future EU operations in approximately 388,000 square feet of floor space and free up approximately 633,000 square feet of space for eventual D&D. The consolidation of all **Category I and II (Cat I/II) SNM** into two facilities (the proposed UPF and the newly operational HEUMF) would significantly improve physical protection and effectively meet the NNSA's graded security protection policy; optimize material accountability; enhance worker, public, and environmental safety; and consolidate operations to greatly reduce operational costs (B&W 2004a).

#### Categories of SNM

A designation determined by the quantity and type of SNM. NNSA uses a cost-effective, graded approach to providing SNM safeguards and security. SNM is categorized into security Categories I, II, III, and IV, with Categories I and II requiring the highest safeguards and security.

The benefits of executing the UPF project include reliable, long-term, consolidated EU processing capability for the nuclear security enterprise with modern technologies and facilities; improved security posture for SNM; improved health and safety for workers; and a highly attractive return on investment. While operational today, the reliability of the existing facilities will continue to erode because of aging facilities and equipment. The UPF would replace multiple aging facilities with a modern facility that would be synergistic with the HEUMF to provide a robust SNM capability and improve responsiveness, agility, and efficiency of operations (B&W 2007).

With the consolidation of SNM operations, incorporation of integral security systems, and the 90 percent reduction of the Protected Area, the security posture would be greatly improved under any UPF Alternative. The use of engineered controls to reduce reliance on administrative controls and personal protection equipment to protect workers would improve worker health and safety. In addition, use of new technologies and processes may eliminate the need for some hazardous materials, reduce emissions, and minimize wastes. Cost savings and cost avoidance as a result of building a UPF would include the following<sup>9</sup>:

- Savings from consolidation related to right-sizing of facilities/footprint, more efficient operations, and simplification of SNM movement;

<sup>9</sup> The projections of cost savings and cost avoidance in this SWEIS are a snapshot in time of what NNSA expects to achieve, given a specific set of requirements over a given period of years. At this early stage in the process of estimating costs, it should be acknowledged that cost savings and avoidances would be reconsidered on an ongoing basis as the design matures and as more information is known about costs. As planning for the modernization of Y-12 proceeds, NNSA would continue to review all appropriate options to achieve savings and efficiencies in the construction and operation of these facilities (White House 2010).

- Operating and maintenance (O&M) cost reductions of approximately 33 percent from current operations;
- Reducing the footprint of the PIDAS-protected area by 90 percent (from 150 acres to about 15 acres), which would allow better concentration of the protective force over a smaller area;
- Reducing the number of workers required to access the Protected Area, which would improve the productivity of workers assigned to non-SNM activities that are currently located in the Protected Area. By reducing the size of the PIDAS, it is forecast that approximately 600 employees would not have to enter the PIDAS. It is conceivable that a 20 percent efficiency in non-SNM operations could be realized by not being encumbered with access requirements and restrictions of the PIDAS. Projects that support non-SNM operations would be less expensive because of improved productivity (B&W 2007).

Significant improvements in cost and operational efficiency would be expected from a new UPF. These improvements would include the expectation that new, reliable equipment would be installed, greatly reducing the need for major corrective maintenance (e.g., less than half of the existing casting furnaces are normally available because of reliability problems). New facilities built within the Material Access Areas (MAAs) are expected to greatly increase efficiencies over the current practice of multiple entries and exits daily into the MAAs. It is also expected that the inventory cycle would be greatly reduced because of more effective means of real-time inventory controls. A more efficient facility layout is expected to decrease material handling steps, including structurally, physically, and operationally integrated material lock-up facilities (B&W 2007).

If a UPF is constructed, the existing non-nuclear processing facilities supporting a UPF would not be upgraded; instead, NNSA would consider pursuing modernization of these facilities in the future if a CMC reaches a stage of development that is ripe for decisionmaking (see Section 3.3).

### **Complex Command Center**

The CCC is proposed under all action alternatives (Alternatives 2-5). The CCC would comprise a new Emergency Services Complex for Y-12. The new facility would house equipment and personnel for the plant shift superintendent (PSS), Fire Department, and Emergency Operations Center (EOC). Approximately 50,000–80,000 square feet of enclosed facility space would be required to accommodate operational needs. The facility would include offices to support Emergency Management personnel and provide habitability to accommodate 50 EOC personnel for a period of 48 hours; 15,000 square feet of pull through garage space; redundant emergency power supply connections and/or supplemental dedicated emergency generators; records storage and processing areas; modern training and conference facilities; shower and changing facilities; specialized equipment storage; food service areas; janitorial closets; separate mechanical and electrical equipment rooms; and telecommunication rooms.

### **1.4.3 Alternative 3 – Upgrade in-Place Alternative**

Under this alternative, NNSA would continue the No Action Alternative and upgrade the existing EU and non-enriched uranium processing facilities to contemporary environmental, safety, and security standards to the extent possible within the limitations of the existing structures and without prolonged interruptions of manufacturing operations. Under this alternative there would be no UPF and parts of the current high-security area would not be downsized. Although existing production facilities would be modernized, it would not be possible to attain the combined level of safety, security and efficiency made possible by the UPF Alternative. The CCC, described above, would also be proposed under this alternative. This alternative also includes continued operations related to other National Security Programs, such as Nonproliferation, Global Threat Reduction Initiatives, and support to Naval Reactors (see Chapter 2). Additionally, there are many non-NNSA programs at Y-12 that would continue under this alternative. Chapter 2 describes these programs. This alternative is referred to as the “Upgrade in-Place Alternative” throughout this SWEIS. The Upgrade in-Place Alternative would be capable of supporting a production level of approximately 125 secondaries and cases per year.

Although an upgrade of existing facilities was not selected in the Complex Transformation SPEIS ROD, the Upgrade in-Place Alternative is included as a reasonable alternative because it would correct some of the facility deficiencies associated with the existing EU and non-enriched uranium processing facilities, and could potentially require smaller upfront capital expenditures than the UPF.

### **1.4.4 Alternative 4 – Capability-sized UPF Alternative**

As discussed in Section 1.5.1, the nuclear weapons stockpile and the nuclear security enterprise have undergone profound changes since the end of the Cold War. Since that time, more than 12,000 U.S. nuclear weapons have been dismantled, no new-design weapons have been produced, three former nuclear weapons plants (Mound, Pinellas, and Rocky Flats) have been closed, nuclear material production plants (Hanford, K-25 at ORR, most of the Savannah River Site [SRS], and Fernald) have stopped production and are being decontaminated, and the U.S. is observing a moratorium on nuclear testing. By 2012, the U.S. nuclear stockpile will be less than one-quarter its size at the end of the Cold War—the smallest stockpile in more than 50 years (D’Agostino 2008). Further, as discussed in Section 1.5.1, on April 8, 2010, Presidents Obama and Medvedev signed the New START Treaty to replace the now-expired 1991 START Treaty. The New START Treaty would cut the nuclear weapons that the United States and Russia will deploy, significantly reduces missiles and launchers, puts in place a strong and effective verification regime, and maintains the flexibility needed to protect and advance national security, and to guarantee unwavering commitment to the security of allies. The New START Treaty would reduce deployed warheads to 1,550, which is about 30 percent lower than the upper warhead limit of the Moscow Treaty (DOS 2010). The New START Treaty entered into force on February 5, 2011.

The goal of the United States is to maintain a credible nuclear deterrent with the lowest possible number of nuclear warheads consistent with national security needs. NNSA developed an alternative, referred to as the “Capability-Based Alternative” in the Complex Transformation

SPEIS, to analyze the potential environmental impacts associated with operations at Y-12 that would support stockpiles smaller than those currently planned. NNSA has assumed that such a stockpile would be approximately 1,000 operationally deployed strategic nuclear warheads. This assumption is consistent with the Complex Transformation SPEIS Capability-Based Alternative (NNSA 2008).

Under Alternative 4, NNSA would maintain a basic manufacturing capability to conduct surveillance and produce and dismantle secondaries and cases. To support this alternative, NNSA would build a smaller UPF (350,000 square feet) compared to the UPF described under Alternative 2 (388,000 square feet). A smaller UPF would maintain all capabilities for producing secondaries and cases, and capabilities for planned dismantlement, surveillance and uranium work for other NNSA and non-NNSA customers. This UPF would be capable of supporting a production level of approximately 80 secondaries and cases per year (compared to 125 secondaries and cases per year for the UPF Alternative). The CCC, described in Section 1.4.2, would also be proposed under this alternative. This alternative also includes continued operations related to other National Security Programs, such as Nonproliferation, Global Threat Reduction Initiatives, and support to Naval Reactors (see Chapter 2). Additionally, there are many non-NNSA programs at Y-12 that would continue under this alternative. Chapter 2 describes these programs.

#### **1.4.5 Alternative 5 – No Net Production/Capability-sized UPF Alternative**

Similar to Alternative 4, a No Net Production/Capability-sized UPF Alternative would maintain the capability to conduct surveillance, dismantle secondaries and cases, and produce secondaries and cases, but would not support adding replacement or increased numbers of secondaries and cases to the total stockpile. The No Net Production/Capability-sized UPF Alternative would be capable of supporting a production level of approximately 10 secondaries and cases per year, which would support a limited Life Extension Program (LEP)<sup>10</sup> workload. This alternative would involve an even further reduction of production throughput at Y-12 compared to Alternative 4. The CCC, described in Section S.1.4.2.2, would also be proposed under this alternative. This alternative also includes continued operations related to other National Security Programs, such as Nonproliferation, Global Threat Reduction Initiatives, and support to Naval Reactors (see Chapter 2). Additionally, there are many non-NNSA programs at Y-12 that would continue under this alternative. Chapter 2 describes these programs.

For either Alternative 4 or Alternative 5, although many of the current facilities at Y-12 would be operated at a reduced throughput, NNSA would need to maintain them in a “ready-to-use” state in the event changes were directed by the President. This means unused capacity would be exercised periodically and standard preventive maintenance and minimal corrective maintenance would be performed on all equipment that could be required for future needs. The related effects on other plant operations of this alternative would include a reduction in utility usage and waste

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<sup>10</sup> An LEP is a systematic approach that consists of a coordinated effort by the design laboratories and production facilities to: 1) determine which components will need refurbishing to extend each weapon’s life; 2) design and produce the necessary refurbished components; 3) install the components in the weapons; and 4) certify that the changes do not adversely affect the safety and reliability of the weapon. The full range of LEP approaches consists of refurbishment of existing warheads, reuse of nuclear components from different warheads, and replacement of nuclear components.

generation, a reduction in staffing, and a steady security posture. Section 1.4.6 provides a summary of the differences among the UPF capacity alternatives.

#### **1.4.6 Capacity Alternatives for the Uranium Processing Facility**

This SWEIS assesses three alternative sizes for the UPF:

- A nominal-sized UPF, described under Alternative 2, with a production level of approximately 125 secondaries and cases per year. This alternative is described in Section 3.2.2;
- A capability-sized UPF, described under Alternative 4, with a production level of approximately 80 secondaries and cases per year. This alternative is described in Section 3.2.4.
- A no net production/capability-sized UPF, described under Alternative 5, with a production level of approximately 10 secondaries and cases per year. This capacity would support surveillance and dismantlement operations and a limited LEP workload,<sup>11</sup> but would not support adding replacement or increased numbers of secondaries and cases to the stockpile. This alternative is described in Section 3.2.5.

Regardless of the ultimate capacity of a UPF, in order to maintain the basic capability to perform the enriched uranium missions, all of the required enriched uranium processes must be included in the facility. In many cases, installing the basic processes in the facility would allow the facility to support multiple units per year. Although the smaller, capability-sized UPFs could be physically smaller than the nominal-sized UPF, an assessment conducted by the UPF Project team at the request of the Nuclear Weapons Council (NWC) Integration Committee 2008 identified only 15 pieces of duplicate equipment that could be eliminated by reducing capacity requirements (NNSA 2008). In terms of square footage of the facility constructed, there would only be a reduction of approximately 38,000 square feet compared to the approximately 388,000 square feet proposed for the nominal-sized UPF described under Alternative 2. Consequently, the capability-sized UPFs described under Alternative 4 and Alternative 5 would not be significantly smaller than the UPF described under Alternative 2. From a square footage standpoint, any “capability”-sized UPF requires a “minimum” of 350,000 square feet to accommodate production equipment/glove boxes. As such, construction requirements for the three UPF capacity alternatives would not vary significantly among the alternatives.

However, there would be notable differences among the three UPF capacity alternatives related to operations. Many of the environmental impacts resulting from operations would be directly affected by the number of components assumed to be produced. For example, operating a nominal-sized UPF to produce 125 secondaries and cases per year would require more electricity, water, and employees than a no-net production or capability-sized UPF that produces 10 or 80 secondaries and cases per year, respectively. Similarly, operating a nominal-sized UPF to produce 125 secondaries and cases per year would emit more uranium to the atmosphere, increase the dose to workers, and produce greater quantities of wastes. However, any UPF option significantly reduces uranium atmospheric discharge, worker dose and waste quantities

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<sup>11</sup> The term “limited LEP workload” refers to the minimal capacity that would be available to produce any required refurbished or reused secondaries.

compared to the No Action or the Upgrade-in-Place Alternatives. Table 1.4.6-1 depicts the operational differences among the alternatives. Table 1.4.6-1 includes data associated with the sensitivity analysis that NNSA prepared for the No Action Alternative and the Upgrade in-Place Alternative at smaller operating levels.

**Table 1.4.6-1. Operational Differences Among Alternatives.**

<b>Requirements</b>	<b>No Action and Upgrade in-Place<sup>a</sup></b>	<b>Nominal Sized UPF<sup>a</sup></b>	<b>Capability-Sized UPF<sup>b</sup></b>	<b>No Net Production/Capability-Sized UPF<sup>c</sup></b>	<b>No Action and Upgrade in-Place for Smaller Operational Levels<sup>b</sup></b>
Peak Electrical Energy Use (MWe)	36-48	36-48	32-43	32-43	32-43
Site-wide Water Use (million gallons/year)	2,000	1,300	1,200	1,080	1,850
Y-12 Site Employment (workers)	6,500	5,750	5,100 <sup>d</sup>	4,500 <sup>d</sup>	5,750
New Steam Plant Generation (billion pounds)	1.5	1.0	0.9	0.8	1.35
Normal Radiological/Uranium Air Emissions (Curie)	0.01	0.007	0.006	0.005	0.009
Total No. of Y-12 Monitored Workers	2,450	2,050	1,825 <sup>d</sup>	1,600 <sup>c</sup>	2,180
Average Individual Worker Dose (mrem)	19.9	10.0	10.0	10.0	19.9
Collective Worker Dose (person-rem)	49.0	20.5	18.2	16.0	43.4
<b>Waste Category</b>					
Low-level Waste					
Liquid (gal)	713	476	428	403	635
Solid (yd <sup>3</sup> )	9,405	5,943	5,643	5,314	8,935
Mixed Low-level Waste					
Liquid (gal)	1,096	679	640	619	1,035
Solid (yd <sup>3</sup> )	126	81	76	71	118
Hazardous (tons)	12	12	7.2	7.2	7.2
Nonhazardous Sanitary (tons)	10,374	9,337	8,140	7,182	9,177

Source: NNSA 2008, B&W 2009a.

a – Supports a production level of approximately 125 secondaries and cases per year.

b – Supports a production level of approximately 80 secondaries and cases per year.

c – Supports a production level of approximately 10 secondaries and cases per year.

d – In the Draft Y-12 SWEIS, the Y-12 site employment number for Alternatives 4 and 5 were 3,900 and 3,400 workers, respectively, and were taken from the Capability-Based Alternative in the Complex Transformation SPEIS (published in October 2008) which was programmatic in nature and provided bounding estimates based on information available at that time. NNSA has prepared the current site employment estimates for Alternatives 4 and 5 based on better defined UPF information, program requirements, and required capacities that are now available. Therefore, NNSA has estimated that the Y-12 site employment levels for Alternatives 4 and 5 would be 5,100 and 4,500, respectively. No change is required in the total number of Y-12 monitored workers from the Draft SWEIS to the Final SWEIS because that number was originally estimated for the SWEIS and is based on currently available information.

## 1.5 National Security Considerations

This section discusses the national security policy overlays and related treaties that are potentially relevant to this SWEIS. Section 1.5.1 discusses nonproliferation and treaty compliance and Section 1.5.2 discusses relevant national security policies and reports, including the recently completed Nuclear Posture Review (NPR).

### 1.5.1 Nonproliferation and Treaty Compliance

NNSA's overarching mission is to contribute to U.S. security by providing the Nation with a safe and reliable nuclear weapons stockpile through the Stockpile Stewardship Program. NNSA intends to do this fully consistent with U.S. nuclear weapons policies and current treaty obligations. This mission requires NNSA to maintain, assess, and certify the stockpile regardless of size, including replacements and repairs. The Stockpile Stewardship Program is fully consistent with and supports the U.S.'s commitment to the Nuclear Nonproliferation Treaty (NPT) and enables the U.S. to continue its 1992 moratorium on underground nuclear testing (DOE 1996a).

The nonproliferation and treaty compliance aspects of the Stockpile Stewardship Program were evaluated in Chapter 2 of the *Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE/EIS-0236) (DOE 1996a). The SSM PEIS analyzed the nonproliferation aspects of the Stockpile Stewardship Program and concluded that implementation of the Stockpile Stewardship Program and maintaining nuclear weapons competencies and capabilities are fully consistent with the NPT (DOE 1996a). This evaluation included the operation of Y-12 and its responsibilities under the Stockpile Stewardship Program. These conclusions remain valid whether or not Y-12 modernization continues.

Article VI of the NPT obligates the parties "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control" (NPT 1970). The NPT does not identify a specific date for achieving nuclear disarmament. U.S. compliance with its commitment under Article VI, however, has been outstanding. In 1995, when the NPT was indefinitely extended, the U.S. reiterated its commitment under Article VI to work toward the ultimate goal of eliminating nuclear weapons, and to general and complete disarmament (DOE 1996a). Over the past 20 years, significant progress has been made in fulfilling this commitment. The U.S. has been reducing its nuclear forces and nuclear weapons stockpile in a consistent fashion through both unilateral and bilateral initiatives, and working cooperatively with allies and partners to further reduce nuclear threats, as evidenced by the following examples:

- The Moscow Treaty, which entered into force in 2003, commits the U.S. and Russia to deep reductions (i.e., to a level of 1,700–2,200 operationally deployed strategic nuclear warheads by 2012);
- Under the Strategic Arms Reduction Treaty (START) and the Moscow Treaty, the U.S. will have decommissioned, over the period of two decades, more than three-quarters of its strategic nuclear warheads attributed to its delivery vehicles;

- On December 18, 2007, the White House announced the President’s decision to reduce the nuclear weapons stockpile by another 15 percent by 2012. This means the U.S. nuclear stockpile will be less than one-quarter its size at the end of the Cold War—the smallest stockpile in more than 50 years (D’Agostino 2008);
- On July 6, 2009, Presidents Obama and Medvedev signed a Joint Understanding to guide the remainder of the negotiations. The Joint Understanding commits the United States and Russia to reduce their strategic warheads to a range of 1,500–1,675, and their strategic delivery vehicles to a range of 500–1,100. Under the expiring START and the *Moscow Treaty* the maximum allowable levels of warheads is 2,200 and the maximum allowable level of launch vehicles is 1,600 (White House 2009).
- On April 8, 2010, Presidents Obama and Medvedev signed the New START Treaty to replace the now-expired 1991 START Treaty. The New START Treaty would cut the nuclear weapons that the United States and Russia will deploy, significantly reduces missiles and launchers, puts in place a strong and effective verification regime, and maintains the flexibility needed to protect and advance national security, and to guarantee unwavering commitment to the security of allies. The New START Treaty would reduce deployed warheads to 1,550, which is about 30 percent lower than the upper warhead limit of the Moscow Treaty. The New START Treaty entered into force on February 5, 2011. The treaty allows a full seven years for these reductions to be made and will remain in effect for 10 years (DOS 2010).

### **1.5.2 National Security Policies and Relevant Reports**

In 2008, Congress directed the Secretary of Defense to conduct a comprehensive review of the nuclear posture of the United States for the next 5–10 years. The review, which began in the spring of 2009, was originally scheduled to be submitted to Congress in December 2009, but was delayed until April 2010. The 2010 NPR outlines the Administration’s approach to promoting the President’s agenda for reducing nuclear dangers and pursuing the goal of a world without nuclear weapons, while simultaneously advancing broader U.S. security interests. While the NPR focuses principally on steps to be taken in the next 5-10 years, it also considers the path ahead for U.S. nuclear strategy and posture over the longer term. The 2010 NPR focuses on five key objectives of U.S. nuclear weapons policies and posture:

1. Preventing nuclear proliferation and nuclear terrorism;
2. Reducing the role of U.S. nuclear weapons in U.S. national security strategy;
3. Maintaining strategic deterrence and stability at reduced nuclear force levels;
4. Strengthening regional deterrence and reassuring U.S. allies and partners; and
5. Sustaining a safe, secure, and effective nuclear arsenal.

Of these objectives, the fifth one is most relevant to the Y12 SWEIS. Regarding this objective, the 2010 NPR states:

“The United States is committed to ensuring that its nuclear weapons remain safe, secure, and effective. Since the end of U.S. nuclear testing in 1992, our nuclear warheads have been maintained and certified as safe and reliable through a Stockpile Stewardship Program that has extended the lives of warheads by refurbishing them to nearly original

specifications. Looking ahead three decades, the NPR considered how best to extend the lives of existing nuclear warheads consistent with the congressionally mandated Stockpile Management Program and U.S. nonproliferation goals, and reached the following conclusions:

- The United States will not conduct nuclear testing and will pursue ratification and entry into force of the Comprehensive Nuclear Test Ban Treaty.
- The United States will not develop new nuclear warheads. Life Extension Programs (LEPs) will use only nuclear components based on previously tested designs, and will not support new military missions or provide for new military capabilities.
- The United States will study options for ensuring the safety, security, and reliability of nuclear warheads on a case-by-case basis, consistent with the congressionally mandated Stockpile Management Program. The full range of LEP approaches will be considered: refurbishment of existing warheads, reuse of nuclear components from different warheads, and replacement of nuclear components.

In any decision to proceed to engineering development for warhead LEPs, the United States will give strong preference to options for refurbishment or reuse. Replacement of nuclear components would be undertaken only if critical Stockpile Management Program goals could not otherwise be met, and if specifically authorized by the President and approved by Congress.

In order to remain safe, secure, and effective, the U.S. nuclear stockpile must be supported by a modern physical infrastructure—comprised of the national security laboratories and a complex of supporting facilities—and a highly capable workforce with the specialized skills needed to sustain the nuclear deterrent. As the United States reduces the numbers of nuclear weapons, the reliability of the remaining weapons in the stockpile—and the quality of the facilities needed to sustain it—become more important.” (NPR 2010)

The NPR concluded that the following key investment was required to sustain a safe, secure, and effective nuclear arsenal: “Developing a new Uranium Processing Facility at the Y-12 Plant in Oak Ridge, Tennessee to come on line for production operations in 2021. Without an ability to produce uranium components, any plan to sustain the stockpile, as well as support for our Navy nuclear propulsion, will come to a halt. This would have a significant impact, not just on the weapons program, but in dealing with nuclear dangers of many kinds.” (NPR 2010)

Finally, with respect to the sizing of any new facilities, the NPR states, “New production facilities will be sized to support the requirements of the Stockpile Stewardship Program mandated by Congress and to meet the multiple requirements of dismantling warheads and eliminating material no longer needed for defense purposes, conducting technical surveillance, implementing life extension plans, and supporting naval requirements. Some modest capacity will be put in place to accommodate surge production in the event of significant geopolitical ‘surprise’.” (NPR 2010)

One additional study relevant to the Y-12 SWEIS is discussed below.

In November 2009, a report entitled “Lifetime Extension Program” (LEP) was released by JASON, an independent group of scientists which advises the NNSA on various issues (JASON 2009). That report evaluated the LEP strategies for maintaining the nuclear deterrent in the absence of underground nuclear testing. One of the major conclusions of that report was that there is no evidence that accumulation of changes incurred from aging and LEPs have increased risk to certification of today’s deployed nuclear warheads. According to JASON, “this finding is a direct consequence of the excellent work of the people in the US nuclear weapons complex supported and informed by the tools and methods developed through the Stockpile Stewardship program. Some aging issues have already been resolved. The others that have been identified can be resolved through LEP approaches similar to those employed to date.” The JASON report also concluded that, “Lifetimes of today’s nuclear warheads could be extended for decades, with no anticipated loss in confidence, by using approaches similar to those employed in LEPs to date.” While the JASON report also identifies recommendations which NNSA could adopt to further strengthen the LEP, NNSA believes the JASON report affirms NNSA’s overall LEP strategy.

## **1.6 LAWS AND REGULATIONS AND NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE STRATEGY**

NEPA and the regulations promulgated by the Council on Environmental Quality (CEQ) (40 CFR 1500-1508) establish environmental policy, set goals, and provide a means for implementing the policy. The key provision of NEPA requires preparation of an EIS for “major Federal actions significantly affecting the quality of the human environment” (40 CFR 1502.3). NEPA ensures that environmental information is available to public officials and citizens before decisions are made and actions are taken (40 CFR 1500.1[b]). 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 CEQ (40 CFR 1500-1508) and DOE’s regulations implementing NEPA (10 CFR 1021).

The purpose of a SWEIS is to (1) provide DOE and its stakeholders with an analysis of the potential individual and cumulative environmental impacts associated with ongoing and reasonably foreseeable new operations and facilities, (2) provide a basis for site-wide decision making, and (3) improve and coordinate agency plans, functions, programs, and resource utilization. Additionally, a SWEIS provides an overall NEPA baseline for a site that is useful as a reference when project-specific NEPA documents are prepared.

## **1.7 RELATIONSHIP OF THIS SWEIS WITH OTHER NATIONAL ENVIRONMENTAL POLICY ACT REVIEWS**

DOE/NNSA has prepared or is currently preparing other programmatic, project-specific, and site-wide NEPA documents that have influenced the scope of this SWEIS. These documents, and their relationship to the Y-12 SWEIS, are discussed below.

### 1.7.1 Programmatic National Environmental Policy Act Reviews

DOE/NNSA has prepared several NEPA documents to determine how best to carry out its national security requirements. As a result, DOE/NNSA has already decided that Y-12 would continue its historic missions and modernize and downsize the site consistent with future national security requirements. This SWEIS, which “tiers” from these prior PEISs, analyzes the potential environmental impacts associated with the various Y-12 proposed actions and alternatives for implementing these decisions. The prior NEPA documents are summarized below:

#### Tiering

As stated in 40 CFR Part 1508.28 “tiering” refers to the coverage of general matters in broader environmental impact statements or environmental analyses incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. For example, this SWEIS uses the prior decisions made as a result of broad PEISs/SWEISs as a starting point, rather than revisiting those prior issues.

- ***Complex Transformation Supplemental Programmatic Environmental Impact Statement (DOE/EIS-0236-S4)*** (NNSA 2008). A ROD was issued on December 19, 2008 (73 FR 77644), in which DOE decided to maintain the existing national security missions at Y-12 and build a UPF in order to provide a smaller and modern highly-enriched uranium production capability to replace existing 50-year-old facilities. This new Y-12 SWEIS, which tiers off of the Complex Transformation SPEIS and analyzes alternatives for implementing the decisions reached in the Complex Transformation SPEIS ROD, is the next major step.
- ***Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (DOE/EIS-0236)*** (DOE 1996a). A ROD was issued on December 19, 1996 (61 FR 68014), in which DOE decided to maintain the existing national security missions at Y-12, but modernize and downsize the facilities. The original 2001 Y-12 SWEIS was the initial major step in implementing the SSM PEIS ROD for Y-12.
- ***Storage and Disposition of Weapons-Usable Fissile Materials, Final PEIS (DOE/EIS-0229) (S&D PEIS)*** (DOE 1996b). A ROD was issued on January 14, 1997 (62 FR 3014), in which 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 and/or new facilities pending disposition. The 2001 Y-12 SWEIS tiered off of the S&D PEIS and analyzed alternatives for implementing the decision reached in the S&D PEIS ROD. The S&D ROD formed the basis for continuing the HEU Storage Mission at Y-12 and the proposal to construct and operate a new HEUMF. This new Y-12 SWEIS continues to tier off of the S&D PEIS by continuing the HEU storage mission at Y-12. However, there are no new site-specific proposals related to HEU storage in this new SWEIS.
- ***Waste Management PEIS (DOE/EIS-0200-F)*** (DOE 1997). The Final PEIS was issued in May 1997. Multiple RODs were 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 offsite facilities for the treatment of major portions of the non-wastewater hazardous waste generated at DOE sites. In accordance with the ROD, ORR, including Y-12, will treat some of its own non-wastewater hazardous waste onsite, 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 No Action Alternative. A second ROD for transuranic (TRU) waste was issued on January 23, 1998 (63 FR 3629). TRU waste at ORR will be packaged to meet waste acceptance criteria for the Waste Isolation Pilot Plant (WIPP) in New Mexico and then stored onsite for eventual disposal at the WIPP. A third ROD for management of low-level waste (LLW) and mixed LLW (MLLW) was issued on February 25, 2000 (65 FR 10061). For the management of LLW, DOE decided to establish regional LLW disposal at two DOE sites: the Hanford Site and the Nevada Test Site (NTS). Specifically, the Hanford Site and NTS will each dispose of its own LLW onsite, and will receive and dispose of LLW that is generated and shipped (by either truck or rail) by other sites that meets the waste acceptance criteria. In addition, DOE will continue, to the extent practicable, to dispose of LLW onsite at Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), ORR, and SRS. For mixed LLW, DOE decided to establish regional MLLW disposal operations at two DOE sites: the Hanford Site and NTS. The Hanford Site and NTS will each dispose of its own MLLW onsite, and will receive and dispose of MLLW generated and shipped (by truck or rail) by other sites, consistent with permit conditions and other applicable requirements. For this Y-12 SWEIS, waste management activities for all alternatives would be carried out consistent with these RODs. (See Section 4.13 for a discussion of the waste management activities at Y-12.)

- ***Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapons Components (DOE/EIS-0225)*** (DOE 1996c). A ROD was issued on January 27, 1997 (62 FR 3880), in which DOE decided that Pantex would continue operations involving assembly and disassembly of nuclear weapons. The decision 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 analyzed in this Y-12 SWEIS and are included in the No Action Alternative.
- ***Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (DOE/EIS-0309)*** (DOE 2001a). The Final Y-12 SWEIS, issued in September 2001, evaluated alternatives related to the operation of Y-12 for approximately a 10-year planning period. One of the primary goals of the 2001 Y-12 SWEIS was to provide an overall NEPA baseline for all DOE activities at Y-12, including an assessment of a Y-12 Modernization Program and infrastructure reduction consistent with previous programmatic decisions. In the ROD for the 2001 Y-12 SWEIS (67 FR 11296, March 13, 2002), NNSA decided to implement the alternative that includes the continued operations at Y-12 to meet the NNSA mission requirements and other DOE program activities, together with the construction and operation of two new facilities: HEUMF and the SMC. Y-12 completed construction of the HEUMF, and the facility began full-scale operations in 2010. Since publication of the ROD, the NNSA decided to not construct the SMC, but

to construct a Purification Facility instead (see the discussion of the *Supplement Analysis for Purification Facility, Site-Wide Environmental Impact Statement for the Y-12 National Security Complex* (DOE/EIS-0309/SA-1) (NNSA 2002) in Section 1.7.2 below. In this new Y-12 SWEIS, NNSA proposes to continue assessing alternatives related to the continued modernization of Y-12. The No Action Alternative in this SWEIS is the continued implementation of the actions identified in the original Y-12 SWEIS ROD, together with implementation of decisions subsequent to that ROD which have undergone separate NEPA review (see Section 1.7.2).

### 1.7.2 Project-Specific *National Environmental Policy Act* Reviews

- ***Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement (DOE/EIS-0240)*** (DOE 1996d). 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 non-weapons-usable low enriched uranium (LEU) for use as commercial reactor fuel or as a LLW. Capabilities exist at Y-12 to perform only small-scale (500–700 kilograms per year) HEU blending operations. The small-scale (500–700 kilograms per year) down-blending of HEU is included in the Y-12 No Action 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 or are reasonably foreseeable to increase the capacities at Y-12 at this time. Therefore, the potential impacts of this operation are not included in this Y-12 SWEIS. In October 2007, NNSA prepared a supplement analysis (SA) to summarize the status of HEU disposition activities conducted to date and to evaluate the potential impacts of continued program implementation (DOE/EIS-0240-SA1). In addition, that SA considered the potential environmental impacts of proposed new DOE/NNSA initiatives to support the surplus HEU disposition program. Specifically, DOE/NNSA proposed new end-users for existing program material, new disposal pathways for existing program HEU discard material, and down-blending additional quantities of HEU.
- ***Potable Water Systems Upgrade Project Environmental Assessment (DOE/EA-1548)*** (DOE 2006a). NNSA recently completed an Environmental Assessment (EA) to upgrade the potable water system at Y-12. The Potable Water Systems Upgrade Project EA analyzes five alternatives: (1) New Elevated Water Tanks along Bear Creek Road (Proposed Action), (2) New Water Tanks on Pine Ridge, (3) Pump Station Feed Loop alternative, (4) Local Pumping Stations alternative, and (5) the No Action Alternative. The Proposed Action is to install two new elevated water tanks, a pumping station, and system supply lines north of Bear Creek Road; inspect and replace if necessary, original potable water distribution lines; inspect and replace where necessary, the original water supply lines (potable and fire) to individual buildings expected to remain in use past 2010; replace approximately 40 obsolete fire hydrants; and install backflow prevention, convert to dry pipe or isolate approximately 85 existing fire suppression loops in order to prevent cross contamination from propylene glycol sprinkler systems.

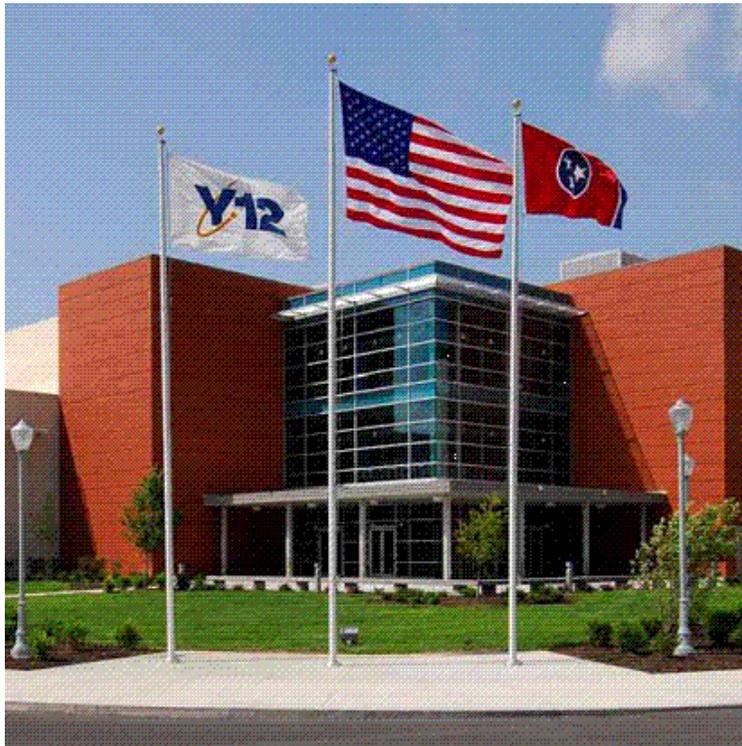
Upgrades to the Y-12 potable water system would allow Y-12 to (1) meet regulatory requirements for safe drinking water by providing backflow protection for known cross connections and ensuring proper chlorine residual maintenance in the system; (2) provide Y-12 control and monitoring of water coming into the Y-12 distribution system to ensure adequate water flow and pressure to support current and future Y-12 operational needs; and (3) address deferred maintenance and ensure continued system reliability by inspecting, evaluating, and repairing or replacing deteriorated cast iron water mains and building feeds and obsolete fire hydrants. Based on the analysis in the EA, a Finding of No Significant Impact (FONSI) was issued in March 2006. The upgraded potable water system became operational in September 2010.

- ***Supplement Analysis for Purification Facility, Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (DOE/EIS-0309/SA-1)*** (NNSA 2002). As discussed in Section 1.7.1, the NNSA issued a ROD on the Y-12 SWEIS which included a decision to construct and operate the SMC. The proposed SMC comprised several facilities including the Purification Facility. The SMC was subsequently cancelled due to changing mission requirements and replaced by a smaller facility that pertains to purification only. In the SA, Y-12 proposed to construct and operate the Purification Facility in order to successfully meet its current accelerated mission requirement for purification of material, as established by the Stockpile Stewardship Program. The Purification Facility was proposed as a facility restricted to special materials wet chemistry processing capability. The Purification Facility would use a purification process that mimics the historical purification process, using modern control equipment that satisfies current engineering codes and standards. The Purification Facility was proposed as a single-story building, approximately 10,000 square feet, constructed from structural steel framing with a metal roof deck and siding. The facility would have an adjoining tank farm with a concrete pad and roof but no exterior walls. After completing the SA in August 2002, NNSA determined that no further NEPA documentation was required.

Construction of the Purification Facility began in August 2003 and was completed in 2004. Engineering test and checkout were completed in 2005, and the Purification Facility is now operational. The Purification Facility is the first major production facility built at Y-12 in more than 30 years.

- ***Environmental Assessment for the Alternate Financed Facility Modernization (DOE/EA-1510)*** (NNSA 2005d). As part of the NNSA modernization initiative, NNSA proposed to transfer two parcels of real estate at Y-12, under Section 161(g) of the *Atomic Energy Act*, to a private development corporation. The private development corporation would finance and construct technical, administrative, and light laboratory facilities in an integrated commercial office park approach in support of the NNSA. In addition to the Land Transfer (Proposed Action), the EA analyzed the alternative of constructing the new facilities using the Federal line item process, as well as the No Action Alternative. A FONSI was issued in January 2005 and construction of the two new facilities, the Production Interface Facility and the Public Interface Facility, began in late 2005 and was completed in 2007. The Public Interface Facility (now called “New

Hope”) is located on Y-12’s east end and houses a visitor’s center and other functions requiring frequent interaction with the public. The Production Interface Facility (now called “Jack Case”), was built north of the recently demolished Y-12 Administration Building, and houses administrative, technical, and scientific functions previously scattered across the site (Figure 1.7-1). Together, these new facilities replaced about 1 million square feet of obsolete work space with about 540,000 square feet of modern office and laboratory space for about 1,500 employees.



**Figure 1.7-1. Production Interface Facility (Jack Case).**

- **Compressed Air Upgrades Categorical Exclusion.** The Compressed Air Upgrades Project (CAUP) corrects deficiencies related to reliability and efficiency by providing new compressed air capability to meet the current and long-range needs of Y-12. The project upgrades the compressed air system by replacing obsolete equipment with state-of-the-art technology equipment and controls. CAUP installed a new instrument/plant air system in reuse facility 9767-13. During the conceptual design phase, NEPA reviews were completed and a determination was made in January 2003 that CAUP work fulfills the requirements of an existing **categorical exclusion (CX)**. The applicable CX that covers the work is Section B1.3 from the DOE NEPA Regulations (10 CFR Part 1021, Subpart D, Appendix B), regarding the routine maintenance/custodial services for buildings, structures, infrastructures, and equipment.

**Categorical Exclusion**

A Categorical Exclusion is a NEPA determination applied to an action that DOE has determined does not individually or cumulatively have a significant effect on the human environment

- **Security Improvements Project (SIP) Categorical Exclusion.** The purpose of the SIP is to replace the existing Y-12 security system with the NNSA-preferred Argus security system, a special purpose, automated information system that will be continuously operating and monitored by Y-12 security personnel. The project would provide a comprehensive and integrated security system that performs the required security functions and meets applicable DOE Orders. The project directly supports the mission by maintaining the security capabilities of Y-12 to protect national security by applying advanced technology to the nation's defense. SIP's scope is limited to installing the Argus technology backbone in the existing Central and Secondary Alarm Stations, installing software gateways to existing alarms, and installing new Argus components in the HEUMF.

During the conceptual design phase, NEPA reviews were completed and a determination was made in May 2007 that the SIP fulfills the requirements of existing CXs. The applicable CXs that cover the work are from the DOE NEPA Implementing Procedure (10 CFR Part 1021, Subpart D, Appendix B) regarding routine maintenance/custodial services for buildings, structures, infrastructures, and equipment (Section B1.3 and Section B1.31), and installation/ improvement of fire detection and protection systems (Section B2.2).

- **Nuclear Facility Risk Reduction (NFRR) Project Categorical Exclusion.** The NFRR line item project will directly contribute to the safety and reliability of Building 9212 and Building 9204-2E which are needed to continue NNSA current missions at Y-12. The NFRR Project will reduce risk of failure of infrastructure in these mission-essential Y-12 facilities by implementing practical, capital modifications determined prudent and necessary to ensure continued safe operations at existing levels. The project scope includes improving maintainability and reliability needed to address the risk of failure of selected, high priority, infrastructure utility systems, structures, and components through planned replacement of critical electrical control centers, switchgear, stacks, casting furnace vacuum system, and cooling tower and steam system pipes. Execution of this project will address the 2005 Defense Nuclear Facility Safety Board (DNFSB) risk review recommendations (except for natural phenomena concerns) and backlogged deferred maintenance by replacing failing and obsolete equipment with new. During the conceptual design phase, NEPA reviews were completed and a determination was made in December 2008 that NFRR work fulfills the requirements of existing CXs.
- **Y-12 Steam Plant Replacement Project.** In August 2007, NNSA completed an EA to replace the existing Y-12 steam plant with a new centralized steam plant. Deteriorated systems, structures, and components with the existing Y-12 steam plant were quickly reaching the end of their useful process life and studies conducted to determine the best value for continuing steam production recommended replacement options rather than life extension of the existing steam plant. The Y-12 Steam Plant EA analyzed three alternatives: (1) Installation of skid mounted gas fired boilers (Proposed Action), (2) renovation of the existing steam plant, and (3) the No Action Alternative. The proposed action proposed to utilize skid mounted gas fired boilers and would require a

new building, several package boilers, water treatment units and two fuel oil storage tanks.

The Y-12 Steam Plant Replacement Project provides a long-term source for steam production at Y-12 to continue reliable operations. Reliable and cost-effective steam generation is vital to the operation of Y-12. It is the primary source of building heat for personnel comfort and it provides freeze protection for critical services that include fire protection systems and heat tracing of exterior above ground water systems. Steam is also necessary to support the current production mission that includes regeneration of dehumidification systems and operation of steam-powered ejectors in wet chemistry operation of Enriched Uranium Operations. A FONSI was signed on September 6, 2007 (YSO 2007). The new steam plant became operational in June 2010.

- ***Environmental Assessment for the Transportation of Highly Enriched Uranium from the Russian Federation to the Y-12 National Security Complex and Finding of No Significant Impact (DOE/EA-1471)*** (DOE 2004d). DOE/NNSA prepared this EA in January 2004 to evaluate the environmental impacts of transporting HEU from Russia to Y-12 for safe, secure storage. The amount of HEU to be transferred under the proposed action would be, on average, approximately 366 pounds per year over a period of 10 years. The HEU would eventually be sent to a facility in Lynchburg, Virginia, where it would be fabricated into reactor fuel. The analysis in the EA shows that the proposed transfer of HEU from Russia to the United States entails little or no risk to the quality of the environment or to human health. Based on the analysis in the EA, a FONSI was issued in 2004 (DOE 2004d).
- ***Environmental Assessment for the Transportation of Unirradiated Uranium in Research Reactor Fuel from Argentina, Belgium, Japan and the Republic of Korea to the Y-12 National Security Complex (DOE/EA-1529)*** (DOE 2005h). DOE/NNSA prepared this EA in June 2005 to evaluate the environmental impacts of transporting uranium from various foreign countries to Y-12 for safe, secure storage. The uranium would eventually be sent to a facility in Lynchburg, Virginia, where it would be fabricated into reactor fuel. The analysis in the EA shows that the proposed transfer of uranium from the various foreign countries to the United States entails little or no risk to the quality of the environment or to human health. Based on the analysis in the EA, a FONSI was issued in 2005 (DOE 2005h).
- ***Supplement Analysis for the Air and Ocean Transport of Enriched Uranium Between Foreign Nations and the United States (DOE/EIS-0309-SA-2)*** (DOE 2006b). DOE/NNSA prepared this SA in August 2006 to evaluate the environmental impacts of incident-free (normal operation) air and sea transport, as well as the environmental impacts of postulated accidents. The impacts are presented in terms of radiological consequences (doses) and risks (latent cancer fatalities [LCFs]) to the aircraft crew, cargo handlers, ship crew, noninvolved workers, and the public. The SA concluded that the environmental impacts of sea transport of enriched uranium are bounded by previous analyses of sea transport of enriched uranium and foreign research reactor spent nuclear fuel.

### 1.7.3 Other Documents

- ***Final Mercury Management Environmental Impact Statement*** (DLA 2004). This EIS was prepared by the Defense Logistics Agency (DLA) to assess the impacts associated with the disposition of excess mercury that was stockpiled for national defense purposes. Stockpiled mercury is now warehoused at five locations in the United States, including Y-12. Approximately 1.5 million pounds of DLA-managed mercury is collocated with approximately 1.5 million pounds of DOE-managed mercury at Y-12. DOE was a cooperating agency for the EIS. Because Y-12 did not have suitable storage space, it was not considered as an alternative site for consolidation of DLA-managed mercury. The Final EIS was published on March 26, 2004 (69 FR 15820). On April 30, 2004, a ROD was issued in which DLA decided to consolidate its mercury stockpile at one site (69 FR 23733). As a result of that ROD, DLA-managed mercury at Y-12 has been moved out of Y-12.

***Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement.*** In 2008, Congress passed the Mercury Export Ban Act of 2008 (Pub. Law 110-414), which prohibits the export of elemental mercury from the United States effective January 1, 2013. To ensure that elemental mercury is managed and stored safely, the Act directs DOE to take a number of actions. By October 1, 2009, DOE must issue guidance establishing standards and procedures for the receipt, management and long-term storage of elemental mercury generated within the United States at a facility or facilities of DOE. DOE must designate such facilities by January 1, 2010, but is prohibited by the Act from locating such a facility at DOE's Oak Ridge Reservation. At least one such facility must be operational by January 1, 2013. NNSA is evaluating options for the relocation of the NNSA mercury to a facility designated for long-term mercury storage. The Final EIS was published in January 2011. Until such relocation is executed, NNSA will continue to store this stockpile of mercury at Y-12. Such storage ensures that the mercury will not be released to the global environment thereby minimizing mercury emissions and contamination levels in the environment of this toxic material.

### 1.8 TIME PERIOD CONSIDERED IN ANALYSIS

The affected environment described in Chapter 4 is based on data for the calendar years 2006 and 2007. These data, for the most part, were obtained from the *Oak Ridge Reservation Annual Site Environmental Reports (ASER)* for 2003 through 2008 (DOE 2004e, DOE 2005a, DOE 2006b, DOE 2007b, DOE 2008, and DOE 2009b). The analysis time period for new projects and activities or upgrades to existing facilities used in the SWEIS is 2010 to approximately 2020. Impacts for construction and operation of new upgraded facilities and the operation of Y-12's missions under the No Action Alternative are presented in annual increments unless noted otherwise.

### 1.9 PUBLIC INVOLVEMENT

The process of preparing this SWEIS included two opportunities for public involvement: the scoping process and the public comment period for the Draft SWEIS. The scoping process is

required by 40 CFR 1501.7 while the public comment period is required by 40 CFR 1503.1. Section 1.9.1 describes the scoping process and the major scoping comments. Section 1.9.2 summarizes the public comment period process for the Draft SWEIS, the major comments raised by the public, and NNSA’s responses to those comments.

**1.9.1 Scoping Process**

On November 28, 2005, NNSA published a Notice of Intent (NOI) in the *Federal Register* (70 FR 71270) announcing its intent to prepare this Y-12 SWEIS. The public scoping period began on that day and continued through January 31, 2006 (Note: In the NOI, the public scoping comment period was scheduled to end on January 9, 2006. In response to public requests, the public scoping comment period was extended until January 31, 2006 [71 FR 927]). The NOI invited interested parties to attend two public scoping meetings on December 15, 2005, in Oak Ridge. The major comments received during the scoping process are discussed in this section.

During the Y-12 SWEIS scoping process, NNSA received 340 scoping comment documents from members of the public; interested groups; and Federal, state, and local officials. These included two transcripts from the public scoping meetings held in Oak Ridge, Tennessee. Of the 340 total comment documents received, 290 of the documents were part of a letter writing campaign.<sup>12</sup> Table 1.9-1 provides a summary of the scoping comment categories and the number of comments received in each category. A total of 3,794 comments were identified in the 340 scoping documents received.

**Table 1.9-1. Category Distribution of Scoping Comments.**

Category	No. of Comments
Policy	870
Purpose and Need	290
Alternatives	875
Nonproliferation	580
Environmental Compliance	290
Water Quality	290
Air Quality	2
Land Use	1
Transportation	1
Mitigation Measures	1
Terrorism	290
Cost	290
Cumulative Impacts	3
NEPA Process	2
Y-12 Missions	1
Worker and Public Health and Safety	3
Out of Scope Comments	5
<b>Total</b>	<b>3,794</b>

Source: Original.

<sup>12</sup> A letter writing campaign generally includes letters from many people with substantively similar comments

### 1.9.1.1 Major Scoping Comments

NNSA has considered all scoping comments in preparing the Draft Y-12 SWEIS. A Scoping Summary Report for the Y-12 SWEIS has been prepared and is part of the Administrative Record for this Y-12 SWEIS (NNSA 2006). The major issues identified during scoping centered on the Nation's nuclear weapon policies, the SWEIS alternatives, water quality, and the health and safety of workers and the public. The major issues raised during scoping are discussed below. The text below also includes a discussion of NNSA's consideration of these scoping comments and describes how these comments affected the SWEIS scope and analysis.

- **Shutdown of Y-12.** *Many commentors opposed continuation of Y-12 operations associated with weapons production and stated that the production of nuclear weapons and materials should be halted immediately. Many of these same commentors expressed opposition to any proposed action, such as the UPF, that would modernize nuclear weapons production capabilities.*

The decision to continue the weapons production mission at Y-12 was made by DOE in the SSM PEIS ROD in December 1996 and reaffirmed in the ROD for the Complex Transformation SPEIS issued in December 2008. Shutting down Y-12 is not a reasonable alternative (see Section 3.4). The need for nuclear weapons has been determined by the President and Congress, and is an issue beyond the scope of the Y-12 SWEIS. However, the SWEIS does include Alternatives 4 and 5, in which NNSA would reduce the operational capacity of production facilities to a much smaller annual throughput of secondaries and cases. The No Net Production/Capability-sized UPF Alternative would reduce the throughput to a limited number of secondaries and cases beyond those associated with supporting surveillance, but would not support adding replacement or increased numbers of secondaries and cases to the total stockpile. Alternatives 4 and 5 are included as reasonable alternatives in this SWEIS in order to provide the NNSA with the flexibility to reduce operations at Y-12 if future considerations warrant such reduction.

- **Additional Alternatives.** *Many commentors suggested that NNSA consider another reasonable alternative, which they described as the following:*
  - *Cease weapons production activities at Y-12 immediately;*
  - *Pursue long-neglected dismantlement and disposition mission and only those activities necessary to safely fulfill this mission;*
  - *Construct new, safeguarded, zero-emission facilities with built-in transparency for disassembly and dismantlement;*
  - *Undertake Manhattan Project 2, dedicated to finding solutions to long-term contamination dilemmas;*
  - *Use Oak Ridge's long history of service to the nation, and the clear evidence of need, to leverage funds for thorough cleanup and responsible long-term management of legacy wastes in Oak Ridge;*
  - *Utilize the expertise and resources of ORNL in Manhattan Project 2.*

As explained above, the decision to continue the weapons production mission at Y-12 was made by DOE in the SSM PEIS ROD and affirmed in the Complex Transformation

SPEIS ROD. Ceasing weapons production activities at Y-12 would not satisfy NNSA's purpose and need at this time. However, NNSA has added the Capability-Based Alternatives (Alternatives 4 and 5), which would reduce production capacity at Y-12. With respect to continuing the dismantlement and disposition mission, all alternatives in the SWEIS include continuation of those missions. With respect to "zero-emission" facilities, the proposed action to construct and operate the UPF is expected to reduce radiological emissions from EU operations at Y-12. With respect to cleanup of existing contamination, ORR has an aggressive program for continuing to accelerate the cleanup of the site and will continue to do so for the foreseeable future.

- **Additional Alternatives.** *Several commentors suggested that NNSA consider an alternative in which Y-12 would perform only interim upgrades or construction of new facilities with very short-term returns in terms of efficiency, effectiveness, or safety until decisions are made concerning a consolidated plutonium/uranium production plant, per the Nuclear Weapons Complex Infrastructure Task Force recommendation to the Secretary of Energy Advisory Board (SEAB) in 2005.*

The Complex Transformation SPEIS analyzed alternatives consistent with the Nuclear Weapons Complex Infrastructure Task Force recommendation to the SEAB (SEAB 2005). However, in the Complex Transformation SPEIS ROD, NNSA did not select any of the consolidated alternatives. As such, the alternatives in this SWEIS are consistent with the Complex Transformation SPEIS ROD.

- **Purpose and Need.** *Many commentors stated that the "Purpose and Need" section of the SWEIS must consider U.S. commitments under the NPT in evaluating the impacts to the "whole of the human environment."*

The purpose and need section for this SWEIS includes consideration of the NPT (see Section 1.5.1). As discussed in that section, the operations and alternatives considered in this SWEIS are fully consistent with the NPT.

- **Worker and Public Health and Safety.** *Several commentors expressed concerns related to worker and public health and safety, and stated that the SWEIS should address enriched uranium, beryllium, and other radiological and hazardous materials.*

The SWEIS analyzes potential worker and public health impacts associated with criteria pollutants, hazardous pollutants, including beryllium, and radiological pollutants such as enriched uranium, in Section 5.12 of this SWEIS.

- **Contamination of the East Fork Poplar Creek.** *Many commentors expressed concern regarding contamination of the East Fork Poplar Creek (EFPC), and stated that DOE must address the health risks of EFPC in the current EIS and explain to the public why, after 20 years and more than \$1 billion spent on EFPC alone, levels of contaminants are actually rising.*

Sections 4.7.2 and 5.7.1.2 of this SWEIS include updated information regarding the water quality of EFPC and an assessment of the potential impacts of the alternatives on the

water quality of EFPC and other water resources. The SWEIS also addresses the impacts to health from water contamination (Section 5.12).

- **Terrorism.** *Many commentors expressed concern regarding terrorism, stating that the operations at Y-12 make the area a terrorist target. Some commentors wanted to know what the impacts of a terrorist attack at Y-12 would be.*

NNSA has prepared a classified appendix to this SWEIS that evaluates the potential impacts of malevolent, terrorist, or intentional destructive acts. Substantive details of terrorist attack scenarios, security countermeasures, and potential impacts are not released to the public because disclosure of this information could be exploited by terrorists to plan attacks. Appendix E (Section E.2.14) discusses the methodology used to evaluate potential impacts associated with a terrorist threat and the methodology by which NNSA assesses the vulnerability of its sites to terrorist threats and then designs its response systems.

- **Costs.** *Many commentors expressed concern about the costs associated with nuclear weapons activities and stated that the money would be better spent on environmental cleanup or social programs.*

NNSA will consider the costs associated with the alternatives in the ROD process. With respect to comments about spending priorities, the budget used to support the nuclear weapons stockpile is determined by the Congress and the President.

## 1.9.2 Public Comment Period

NNSA distributed the Draft Y-12 SWEIS in October 2009. The public comment period for the Draft Y-12 SWEIS began on October 30, 2009, with publication of the Environmental Protection Agency’s Notice of Availability in the *Federal Register* (74 FR 56189). That notice invited public comment on the Draft Y-12 SWEIS through January 4, 2010, and provided the schedule for two public hearings to receive comments on the Draft Y-12 SWEIS. During the comment period, two public hearings were held in Oak Ridge, Tennessee, on November 17 and 18, 2009. At the first hearing, NNSA announced an extension of the comment period until January 29, 2010. That announcement was formalized with a notice in the *Federal Register* on December 28, 2009 (74 FR 68599).

Attendance at each public hearing, together with the number of commentors, is presented in Table 1.9-2. Attendance numbers are based on the number of participants who completed and returned registration forms and may not include all of those present at the hearings.

**Table 1.9-2. Public Hearing Attendance and Number of Commentors.**

Hearing Location	Total Attendance	Commentors
Oak Ridge, TN (November 17)	129	54
Oak Ridge, TN (November 18)	165	54

In addition, the public was encouraged to provide comments via mail, facsimile, or e-mail (y12sweis.comments@tetrattech.com). On June 18, 2010, NNSA issued a “Notice of Proposed Wetlands Action” for public comment regarding the construction of roadways (Haul Road extension corridor) and supporting infrastructure.<sup>13</sup> This Wetlands Assessment was prepared in accordance with 10 Code of Federal Regulations (CFR) 1022, "Compliance with Floodplain and Wetlands Environmental Review Requirements" for the purpose of fulfilling NNSA's responsibilities under Executive Order 11990, “Protection of Wetlands.” Along with the Notice, which was published in local newspapers, the Wetlands Assessment (Appendix G) was made available through the DOE Information Center in Oak Ridge, TN. Comments on the Wetlands Assessment were due to NNSA by July 9, 2010. Volume II of this Final SWEIS, the Comment Response Document (CRD), contains the comments NNSA received on the Draft Y-12 SWEIS and Wetlands Assessment as well as NNSA's responses to those comments.

### **1.9.2.1 Major Comments During the Public Comment Process**

Three hundred and fifty-three (353) comment documents (including 151 comment documents as part of 7 e-mail, letter, and postcard campaigns) were received from individuals, interested groups, tribal governments, and Federal, state, and local agencies on the Draft Y-12 SWEIS and Wetlands Assessment. In addition, 115 comment documents were received via e-mail and 108 commentors spoke at the two public hearings. Late comments, submitted after the close of the public comment periods, were also considered by NNSA. The major comments included the following:

- Commentors stated opposition to nuclear weapons, modernization of Y-12, and a new UPF because:
  - The United States is not in compliance with Article VI of the NPT;
  - Nuclear weapons lead to nuclear weapons proliferation;
  - Nuclear weapons are immoral;
  - Nuclear weapon activities make Y-12 and the surrounding community more at risk to accidents and terrorist activities;
  - Nuclear weapons take money away from the clean-up of sites already contaminated;
  - A UPF is not needed;
  - More nuclear weapon activities will produce contamination at Y-12; and/or
  - Nuclear weapon activities result in adverse health and safety impacts in communities surrounding Y-12.
- Commentors stated that the Y-12 SWEIS and any modernization actions should not proceed before a new Nuclear Posture Review is completed in 2010.

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<sup>13</sup> The proposed action includes the development and construction of support facilities located on ORR, specifically, extension of an existing Haul Road, construction of a Site Access and Perimeter Modification Road, development of a Wet Soils Disposal Area, and excess soil placement at the West Borrow Area. In this SWEIS, references to the Haul Road extension corridor generally include both the Haul Road extension and the Site Access and Perimeter Modification Road.

- Commentors felt that there are better ways in which taxpayers' money could be spent, such as: feeding the poor, providing better housing for the poor, performing energy efficiency research and development, and cleaning up contaminated sites.
- Commentors expressed support for a new UPF, stating that such a facility would improve safety, security and reduce costs.
- Commentors stated that a sixth alternative should be added to the SWEIS and considered by NNSA. Alternative 6, which was referred to as the Curatorship Alternative, was described by commentors as follows:

Alternative 6 recognizes a need for a Stockpile Stewardship mission that can be achieved through an upgrade in place to existing facilities. It recognizes the increasing demand for a verifiable safeguarded dismantlement capacity which must be addressed. Current facilities should be analyzed. And if there is a need, [NNSA] can construct a new dismantlement facility. The benefits of such an alternative include workforce retention and the reduction of the high-security area.

- Commentors stated that NNSA needs to prepare a Supplemental Draft SWEIS because the impacts associated with the Haul Road extension corridor and supporting infrastructure were not presented in the Draft Y-12 SWEIS.

### **1.9.2.2      *Major Changes from the Draft Y-12 SWEIS***

In response to comments received on the Draft Y-12 SWEIS, to include data not available at the time of the development of the Draft SWEIS (for example, the Haul Road extension corridor and supporting infrastructure), and to correct errors and omissions, NNSA made changes to the Draft Y-12 SWEIS. The Summary and Volume I of this Final Y-12 SWEIS contain changes, which are indicated by a sidebar in the margin. A summary of the more significant changes is provided below.

- NNSA added a discussion of the dismantlement process and dismantlement requirements to the Final SWEIS (Section S.2.1.1.1 and Section 2.1.1.1).
- NNSA updated the discussion of national security considerations, including information on the New START Treaty (Section S.1.5.1 and Section 1.5.1), the JASON report entitled "Lifetime Extension Program" (Section S.1.5.2 and Section 1.5.2) and the 2010 NPR (Section S.1.5.2 and Section 1.5.2).
- NNSA provided additional information regarding the CCC, including additional information regarding siting considerations for that facility (Section S.3.1.2.2 and Section 3.2.2.2).
- NNSA updated the water use requirements for the alternatives (Section 5.7.7).
- NNSA added information and analysis of the Haul Road extension corridor and supporting infrastructure for the UPF, including a detailed Wetlands Assessment (Section 5.1.2, Section 5.8.2, and Appendix G).

- NNSA added a sensitivity analysis of Alternatives 1 and 3 at smaller operational levels (Section 5.17).
- Based on a better understanding of workforce drivers associated with different capacity scenarios, NNSA revised the employment numbers associated with Alternatives 4 and 5 (Section 5.10.4 and 5.10.5).

In accordance with 40 CFR 1502.9(c)(1), NNSA determined that there were no substantial changes in the proposed action that are relevant to environmental concerns, nor significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. Consequently, NNSA determined that a Supplemental Draft Y-12 SWEIS was not required.