Scoping Comment Summary
for the
Surplus Plutonium Disposition Supplemental Environmental Impact Statement

U.S. Department of Energy, National Nuclear Security Administration, and Tennessee Valley Authority

Since announcement of the *Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SPD Supplemental EIS)*, DOE has provided three opportunities for the public to provide scoping comments (2007 [72 FR 14543]; 2010 [75 FR 41850]; and 2012 [77 FR 1920]). The public scoping periods extended from March 28, 2007, through May 29, 2007; July 19, 2010, through September 17, 2010; and January 12, 2012, through March 12, 2012. Scoping meetings were conducted on April 17, 2007, in Aiken, South Carolina; April 19, 2007, in Columbia, South Carolina; August 3, 2010, in Tanner, Alabama; August 5, 2010, in Chattanooga, Tennessee; August 17, 2010, in North Augusta, South Carolina; August 24, 2010, in Carlsbad, New Mexico; August 26, 2010, in Santa Fe, New Mexico; and February 2, 2012, in Pojoaque, New Mexico. Scoping comments were received during the public meetings, and by letter, fax, and email.

This document summarizes the comments received during the public scoping periods. The comments are grouped into major categories as provided below:

National Environmental Policy Act

Commentors were concerned that existing related National Environmental Policy Act (NEPA) documents need to be supplemented or reissued. This includes the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement (Storage and Disposition PEIS)* (DOE 1996); *Final Waste Management Programmatic Environmental Impact Statement* (DOE 1997a); *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (WIPP SEIS)* (DOE 1997b); *Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory (LANL SWEIS)* (DOE 2008); *Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina* (NRC 2005); *Final Environmental Impact Statement, Interim Management of Nuclear Materials* (DOE 1995a); and *Savannah River Site Waste Management Final Environmental Impact Statement* (DOE1995b). The *SPD Supplemental EIS* is being prepared in accordance with applicable Council on Environmental Quality and DOE NEPA regulations. The *SPD Supplemental EIS* addresses all of the relevant issues and analysis covered in the other documents and updates the analyses where necessary. The other related EISs, supporting supplement analyses, and the decisions announced in the Records of Decision (RODs) for these documents, remain valid, and in accordance with Council on Environmental Quality and DOE NEPA regulations, do not need to be updated before the *SPD Supplemental EIS* can be issued.

Alternatives

Commentors requested that the* SPD Supplemental EIS *list all alternatives identified and the reasons why any alternatives were excluded. Chapter 2, Section 2.3, of the *SPD Supplemental EIS* describes the alternatives analyzed. Section 2.4 describes the alternatives considered, but dismissed from detailed study, and the reasons for their dismissal.

A comment was made that the proposed processing of some of the plutonium through H-Canyon/HB-Line as identified in the Notice of Intent (NOI) should be considered a separate alternative. As described in Chapter 2, Section 2.3.4, of the *SPD Supplemental EIS*, a separate H-Canyon/HB-Line to DWPF Alternative is evaluated.

Commentors supported DOE's Preferred Alternative and early construction and operation of the Mixed Oxide Fuel Fabrication Facility (MFFF) and facilities to prepare feed for MFFF. Commentors supported pit disassembly and conversion in the existing K-Area Complex and H-Canyon/HB-Line at the Savannah River Site (SRS), and the existing Plutonium Facility (PF-4) at Los Alamos National Laboratory (LANL). One commentor suggested that the use of existing DOE assets will achieve significant cost savings and schedule improvements. Comments noted.

Commentors were against the MOX Fuel Alternative, in part because the Mixed Oxide (MOX) Fuel Program is 15 years behind schedule and the time required for testing MOX lead test assemblies (LTAs) is lengthy. As a result, commentors said that MFFF at SRS is at risk of sitting partially or totally idle. Commentors also stated that the **SPD Supplemental EIS** ***must take into account the U.S. Nuclear Regulatory Commission's (NRC's) denial of the operating license application for nuclear reactors using MOX fuel or issuance with restrictive conditions. Some commentors further stated that Congress must immediately begin proper oversight of this program, including a comprehensive investigation by the U.S. Government Accountability Office.*** NRC would determine whether to issue a license (or license amendment) and any license conditions for the commercial reactors that would use MOX fuel. Similarly, the need for further testing of MOX fuel using lead test assemblies would be determined as part of the fuel qualification and licensing process for the reactors. With respect to the MFFF, the SPD Supplemental EIS presents environmental impacts on an annual basis. A delay in MFFF operations would reduce the annual impacts for the time that the delay occurs.

Commentors asked DOE to reconsider previous decisions, including fabrication of 34 metric tons (37.5 tons) of surplus plutonium into MOX fuel; the Preferred Alternative (MOX Fuel Alternative); eliminating the ceramic immobilization disposition option; and eliminating the disassembly of pits at the Pantex Plant (Pantex). A commentor asked that alternative approaches to surplus plutonium disposition be considered, including quicker, less costly methods for disposal. As described in Chapter 1, Section 1.4, of the *SPD Supplemental EIS*, DOE decided to fabricate 34 metric tons (37.5 tons) of surplus plutonium into MOX fuel in MFFF (68 FR 20134), currently under construction at SRS, and to use the MOX fuel in domestic commercial nuclear power reactors to generate electricity, thereby rendering the plutonium into a used (also referred to as "spent") fuel form not readily usable in nuclear weapons. DOE is not reconsidering that decision. Although DOE has announced a Preferred Alternative (see Chapter 2, Section 2.5), DOE has not made a decision with respect to the surplus plutonium analyzed in the *SPD Supplemental EIS* and could select one of the other alternatives or a combination of alternatives. Chapter 2, Section 2.3, describes the alternatives evaluated in the *SPD Supplemental EIS*, and Section 2.4 describes the alternatives considered, but dismissed from detailed study. As summarized in Section 2.4, the *Storage and Disposition PEIS* (DOE 1996) and the *Surplus Plutonium Disposition Final Environmental Impact Statement (SPD EIS)* (DOE 1999) considered numerous alternatives for surplus plutonium disposition, including immobilization of the entire surplus plutonium inventory and pit disassembly and conversion at Pantex. Immobilization of the entire surplus plutonium inventory was evaluated in the *SPD EIS* (DOE 1999) and DOE selected the MOX approach for some of the material declared surplus for reasons set forth in the *SPD EIS* ROD (65 FR 1608). DOE is not revisiting the decisions made in that ROD, or in the 2002 and 2003 amended RODs (67 FR 19432 and 68 FR 20134), other than the decision to construct and operate a stand-alone Pit Disassembly and Conversion Facility (PDCF). Although DOE is reconsidering the decision to build PDCF at SRS and is looking at other options, including using PF-4 at LANL, DOE is not reconsidering its prior decision to not construct a pit disassembly and conversion capability at Pantex, an alternative considered in the *SPD EIS* (DOE 1999).

Commentors were concerned that the collapse of the MOX Fuel Program would result in a total halt to the Surplus Plutonium Disposition Program. Commentors requested that DOE actively pursue a comprehensive study on options to manage plutonium as waste and continue to pursue non-MOX options. Commentors said that quicker and cheaper approaches should be seriously considered, including pit deformation, pit envelopment, and pit stuffing. Commentors suggested chopping up the pits at Pantex, then sending the material to SRS to be encased in high-level radioactive waste (HLW) glass. As described in Chapter 2, Section 2.4, of the *SPD Supplemental EIS*, the *Storage and Disposition PEIS* (DOE 1996), the *SPD EIS* (DOE 1999), and their supporting documents considered a wide range of alternatives for surplus plutonium disposition. These EISs and their RODs describe DOE's decision to build MFFF at SRS and how some methods were eliminated from further consideration. DOE's preferred method for surplus plutonium disposition would either meet the Spent Fuel Standard[1] or provide similar protection from theft, diversion, or future reuse in nuclear weapons. Pit deformation, pit envelopment, and pit stuffing are not considered to render the plutonium into a form that would ensure that it can never again be readily used in nuclear weapons. Therefore, these approaches do not meet the purpose and need for agency action.

Commentors expressed the opinion that the* SPD Supplemental EIS *should not include utility use of MOX fuel and that the decision to use the MOX fuel at a Tennessee Valley Authority (TVA) nuclear power plant should be made by TVA, not DOE. DOE and TVA are cooperating agencies for the *SPD Supplemental EIS* because both are obligated by NEPA, as Federal agencies, to evaluate the environmental impacts of the proposed action. In this case, TVA is evaluating the use of MOX fuel as an alternative to uranium fuel in its reactors. The inclusion of the alternative in the *SPD Supplemental EIS* analysis does not mean TVA has made a decision to use MOX fuel. The decision to use MOX fuel in the reactors at the Browns Ferry and/or Sequoyah Nuclear Plants would be made independently by TVA, subject to license amendments by NRC. Furthermore, any reactor license modifications that may be required to use MOX fuel in TVA reactors would be subject to NRC NEPA regulations in Title 10 of the *Code of Federal Regulations* (CFR) Part 51, as part of the NRC licensing process under 10 CFR Part 50 or 52.

Some commentors supported the immobilization pathway, including extending it to the entire surplus plutonium inventory as preferable to the MOX approach or the use of H-Canyon to process any of the surplus plutonium for disposition. One commentor recommended that DOE cancel the MOX program, deactivate H-Canyon, and evaluate a comprehensive set of all-immobilization alternatives, including (1) construction of an immobilization facility on the MFFF site, (2) consideration of both ceramic and glass options in both existing and greenfield sites, (3) and operation of the proposed vitrification facility for a longer period. As described in Chapter 2, Section 2.4, of the *SPD Supplemental EIS*, immobilization of the entire surplus plutonium inventory was evaluated in the *SPD EIS*, and DOE selected the MOX approach for most of the material declared surplus for reasons set forth in the *SPD EIS* ROD (65 FR 1608). DOE is not revisiting the decisions made in that ROD, or in the 2002 and 2003 amended RODs (67 FR 19432 and 68 FR 20134), other than the decision to construct and operate a stand-alone PDCF.

Commentors opposed the expansion of radioactivity-emitting activities at SRS and LANL, as well as the reprocessing of plutonium into civilian nuclear power fuel because it presents indefensible risks to public safety and the environment. Commentors asserted that manufacturing of plutonium fuel would create vast quantities of radioactive waste. Chapter 4 and supporting appendices of the *SPD Supplemental EIS* present the environmental impacts and human health risks of construction and

[1] *Under the Spent Fuel Standard, the surplus plutonium would be made as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in used nuclear fuel (also known as spent nuclear fuel) from commercial nuclear power reactors.*

operation of surplus plutonium disposition capabilities at SRS and LANL. As described in the *SPD Supplemental EIS*, the environmental impacts and human health risks from normal operations would be low; no cancer fatalities are predicted among the public from normal operations of surplus plutonium disposition activities. As described in Chapter 4, Section 4.1.4, waste generation would be within the capacities of waste management facilities. DOE and TVA are not proposing to reprocess used reactor fuel.

Commentors urged DOE to examine options for surplus plutonium disposition that are simpler and cheaper. As described in Chapter 1, Section 1.4 of the *SPD Supplemental EIS*, DOE decided to fabricate 34 metric tons (37.5 tons) of surplus plutonium into MOX fuel in the MFFF (68 FR 20134) currently under construction at SRS, and to use the MOX fuel in domestic commercial nuclear power reactors to generate electricity, thereby rendering the plutonium into a used (also referred to as "spent") fuel form not readily-usable in nuclear weapons. DOE is not reconsidering that decision. As described in Section 2.4, immobilization of 50 metric tons (55 tons) was analyzed in the *SPD EIS* (DOE 1999) and is not being reconsidered, and, in any case, is not feasible due to the limitations on DWPF operations. As stated in Section 2.4.1, DOE is not analyzing in detail the ceramic immobilization approach. The *SPD Supplemental EIS* evaluates environmental impacts of reasonable alternatives for the disposition of surplus weapons-usable plutonium for which DOE has not made a disposition decision. Cost and other factors may be taken into account as appropriate by DOE in the ROD, following the *SPD Supplemental EIS*.

A commentor stated that pit disassembly should occur where the pits are currently stored and opposed unnecessary transportation of radioactive materials. As described in Chapter 2, Section 2.4, of the *SPD Supplemental EIS*, the *SPD EIS* (DOE 1999) examined Pantex, where the pits are currently safely stored, as an alternative site for pit disassembly and conversion. In the ROD for the *SPD EIS* (65 FR 1608), DOE selected SRS as the location for the surplus plutonium disposition facilities. SRS was selected because the activities would complement existing missions and take advantage of existing infrastructure and staff expertise. DOE is not revisiting the decisions made in that ROD, or in the 2002 and 2003 amended RODs (67 FR 19432 and 68 FR 20134), other than the decision to construct and operate a stand-alone PDCF. Although DOE is reconsidering the decision to build a PDCF at SRS and is looking at other options that would use existing facilities and the experienced workforce at SRS and LANL[2], DOE is not reconsidering pit disassembly and conversion at Pantex for the reasons set forth in the SPD EIS ROD (65 FR 1608) .

Commentors expressed concern that disposal of plutonium at the Waste Isolation Pilot Plant (WIPP) was not considered a reasonable alternative in the previous* Storage and Disposition PEIS*, and requested that DOE explain why disposal at WIPP is a reasonable alternative. As described in Chapter 2, Section 2.4, of the *SPD Supplemental EIS*, the direct disposal of 50 metric tons (55 tons) of surplus plutonium was eliminated from further analysis in the *Storage and Disposition PEIS* because it would exceed the capacity of WIPP when added to DOE's inventory of transuranic (TRU) waste (DOE 1996; 2-13). The disposal at WIPP of up to 6 metric tons (6.6 tons) of non-pit plutonium, which is approximately 12 percent of the amount considered in the *Storage and Disposition PEIS*, would not exceed WIPP's capacity and therefore is considered to be a reasonable alternative in the *SPD Supplemental EIS*. A description of WIPP's capacity and the process that would be used to dispose of surplus plutonium as TRU waste at WIPP is contained in Appendix B, Sections B.1.3 and B.3; the environmental impacts of shipping waste to WIPP are described in Appendix E.

[2] In accordance with previous National Environmental Policy Act (NEPA) decisions (65 FR 1608; 73 FR 55833), 2 metric tons (2.2 tons) of plutonium would be disassembled and converted to plutonium oxide at PF-4 at LANL.

Commentors were concerned that plutonium disposal at WIPP is an affirmation that disposal of plutonium utilizing the "spent fuel standard," by which plutonium is placed in a material with a radiation barrier, is essentially dead. DOE believes that the alternatives, including the WIPP Alternative, analyzed in this SPD Supplemental EIS provide protection from theft, diversion, or future reuse in nuclear weapons akin to that afforded by the Spent Fuel Standard.

Commentors also expressed concern that the* Storage and Disposition PEIS *did not analyze long-term storage of HLW or used nuclear fuel for more than 50 years, which now appears necessary because of DOE's decision to cancel the geologic repository at Yucca Mountain, Nevada. The *SPD Supplemental EIS* describes storage of HLW in Appendix B, Section B.1.4.2, and used nuclear fuel in Section B.4. Plutonium disposition involving H-Canyon/HB-Line or the immobilization capability would result in only a small increase in the number of HLW canisters to be stored at SRS. As described in Appendix I, Sections I.1.2.4 and I.2.2.4, use of MOX fuel could increase used nuclear fuel generation by 2 to 16 percent. Storage facilities and practices would be similar for existing and planned HLW canisters and used nuclear fuel. Differences in the characteristics of HLW canisters and used nuclear fuel associated with the surplus plutonium disposition alternatives are described in the sections of the *SPD Supplemental EIS* referenced above.

Commentors were concerned that safe and secure storage must be the primary focus of the Surplus Plutonium Disposition Program. Plutonium pits are currently safely stored at Pantex near Amarillo, Texas. Most surplus non-pit plutonium is in safe storage at the K-Area Complex at SRS; the remaining surplus non-pit plutonium is in the process of being moved to SRS and, in the interim, is safely stored at other DOE sites. Under all of the alternatives evaluated in the *SPD Supplemental EIS*, the surplus plutonium would be placed into a form in which it can never again be readily used in nuclear weapons.

Public Outreach

Commentors expressed concern about the lack of notification for the 2010 public meetings, including notification in northern Alabama and North Carolina. DOE provided notice of the 2010 public scoping meetings held near potentially affected sites using a variety of media. These included publication of a July 19, 2010, *Federal Register* notice (75 FR 41850), posting the announcement on the project website, press announcements sent to local media outlets, bulk mailings to interested stakeholders on the project mailing list, and publication of advertisements in local newspapers, including the *Athens News-Courier* and the *Huntsville Times* in Alabama. Advertisements were not placed in North Carolina newspapers because none of the potentially affected sites are in North Carolina. Commentors were also provided the opportunity to submit comments via mail, fax and email.

***Commentors expressed concern about the format used for the 2010 public scoping meetings, including the one-question limit during the question-and-answer session, and the 2-minute speaking limit. Commentors were also concerned that the public comments would not be appropriately considered in developing the* SPD Supplemental EIS.** DOE believes that the format of the scoping meetings was adequate. The format used for the public scoping meetings is a standard NEPA public meeting format that has been implemented successfully by DOE and other Federal agencies for many years. The meetings were managed by an experienced meeting facilitator to ensure that all attendees had a chance to be heard and provide comments within the allotted meeting time. The primary reason for holding the public scoping meetings was to gather public input on the scope of the *SPD Supplemental EIS*. DOE needed to ensure that this primary goal was achieved. Therefore, at some meetings, it was necessary to limit questions during the question-and-answer period and impose a time limit on public comments due to the number of meeting attendees and limitations on the amount of time available. The public was also encouraged to provide written questions and comments, using available question and comment cards. As

described in the public scoping meeting materials, DOE considers all comments received and all comments have equal weight, whether written or oral. Commentors were also provided the opportunity to submit comments via mail, fax, and email.

Commentors expressed concern that copies of the MOX brochures, MOX fact sheets, and the MOX DVD available to the attendees during the 2010 public scoping meetings contained incorrect or outdated information. DOE regrets any confusion over the public scoping materials, and revised the materials provided for the 2012 public scoping period on the *SPD Supplemental EIS*. DOE has considered public comments in preparing the materials to be disseminated during the public hearings on the *Draft SPD Supplemental EIS*.

Commentors expressed concern about the lack of public scoping meetings in Michigan and Albuquerque, New Mexico, in 2010. DOE believes that there was an appropriate number of scoping meetings, which were held in eight locations across the country. As described in Chapter 1, Section 1.6, scoping meetings were held in Carlsbad, Pojoaque, and Santa Fe, New Mexico; Santa Fe is within an hour's drive of Albuquerque. Public scoping meetings were not held in Michigan because none of the potentially affected sites is in Michigan.

Commentors requested that the 2010 public scoping period be extended. DOE decided that the 60-day public scoping period was adequate, and did not extend it.

Commentors expressed concern that construction of MFFF began before the public was informed and given the opportunity to comment. The environmental impacts of construction and operation of MFFF were evaluated in the *SPD EIS* (DOE 1999) and the *Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina* (NRC 2005). Both processes included public participation opportunities as required by NEPA. In addition, Shaw AREVA MOX Fuel Services, LLC (MOX Services), received approval of its Construction Authorization Request from NRC prior to the commencement of construction. The NRC construction authorization and licensing process also included opportunities for public input.

Public hearings on the* Draft SPD Supplemental EIS *were requested for both Albuquerque and Santa Fe, New Mexico. Commentors also requested that public hearings on the* Draft SPD Supplemental EIS *be held in states that would have TRU waste displaced from disposal at WIPP. DOE considered the request for meetings in Albuquerque and Santa Fe, New Mexico, when planning for public hearings on the *Draft SPD Supplemental EIS*. Public meetings on the *Draft SPD Supplemental EIS* are not planned to be held in other states, because the current capacity of WIPP would not be exceeded and TRU waste from other states would not be displaced (see Chapter 4, Section 4.5.3.6.3, of the *SPD Supplemental EIS*).

Commentors requested additional scoping meetings during the 2012 scoping period, an extension of the scoping period, and planning of meetings in collaboration with interested parties. As described in the amended NOI (77 FR 1920), because the alternatives added in 2012 did not involve new locations, with the exception of LANL, and because there have been two previous scoping periods for the *SPD Supplemental EIS*, DOE held one additional scoping meeting at Pojoaque, New Mexico, and did not extend the scoping period beyond the 60 days announced in the amended NOI. As described in Chapter 1, Section 1.6, of the *SPD Supplemental EIS*, scoping meetings were held in eight locations to collect public comments, including Carlsbad, Pojoaque, and Santa Fe, New Mexico. The format used for the meetings is a standard NEPA public scoping meeting format that DOE has used successfully for many years.

Commentors requested that DOE keep the public informed of progress during all stages of the NEPA process. After the scoping process, DOE prepared the *Draft SPD Supplemental EIS* and made it available for public comment. During the public comment period that began with publication in the *Federal Register* of the Notice of Availability for the *Draft SPD Supplemental EIS*, DOE is holding public hearings. After considering and responding to public comments, DOE will issue the *Final SPD Supplemental EIS* and subsequently issue a ROD. Information on the *SPD Supplemental EIS* can be found on the project website at http://www.nnsa.energy.gov/nepa/spdsupplementaleis, which is periodically updated throughout the NEPA process. Through the website, individuals can request to be placed on the mailing list in order to receive updates and announcements related to the *SPD Supplemental EIS*.

Surplus Plutonium

One commentor recounted the history of the plutonium declared surplus during the Clinton Administration and requested that DOE reconcile the quantities of plutonium by form and proposed disposition pathway. The quantities of plutonium that are analyzed in the SPD Supplemental EIS are described in Chapter 1, Section 1.5. Figure 1–7 summarizes the disposition paths for surplus plutonium.

Commentors were concerned about the composition of the surplus plutonium and where it is currently stored. DOE has information on the composition of all pit and non-pit plutonium; however, this information is sensitive and therefore has not been included in the *SPD Supplemental EIS*. As described in Chapter 2, Section 2.3.1, plutonium pits are safely stored at Pantex near Amarillo, Texas, and most surplus non-pit plutonium is in safe storage at the K-Area Complex at SRS; the remaining surplus non-pit plutonium is in the process of being moved to SRS, and in the interim, is safely stored at other DOE sites.

Commentors asked DOE to describe the forms of surplus plutonium and where it originated, and wondered if more plutonium may be declared surplus in the future. Another commentor asked if there are any future plans to use reactor-grade plutonium to make MOX fuel. Chapter 1, Section 1.5, describes the surplus weapons-usable plutonium analyzed in the *SPD Supplemental* EIS, which includes all grades (weapons-grade, fuel grade, and reactor-grade[3]) of U.S. surplus pit and non- pit plutonium. It is possible that more plutonium could be declared surplus in the future; therefore, Chapter 4, Section 4.2, describes the potential impacts of the disposition of additional surplus plutonium. DOE currently has no plans to use other reactor-grade plutonium and any such proposal would require additional appropriate NEPA review.

K-Area Plutonium Storage at the Savannah River Site

Commentors requested that the* SPD Supplemental EIS *include an analysis of the impacts of plutonium storage at the K-Area Complex. The impacts of storage of plutonium at the K-Area Complex are presented in Appendix H of the *SPD Supplemental EIS*. Chapter 4 includes the impacts from storage of plutonium at K-Area for all alternatives over the operational period assumed. For example, under the No Action Alternative, the impacts of storage of plutonium at K-Area were evaluated over 40 years. Fewer storage years are analyzed in the action alternatives because the plutonium is removed from storage and dispositioned.

[3] Weapons-grade plutonium contains no more than 7 percent plutonium-240. Fuel-grade plutonium contains approximately 7 to 19 percent plutonium-240. Power reactor-grade plutonium (also referred to as "reactor-grade plutonium") is 19 percent or greater plutonium-240.

A commentor expressed concern about DOE's ability to ensure the continued safe storage of plutonium in K-Area for 50 years. The *DOE Standard for Stabilization, Packaging, and Storage of Plutonium-Bearing Materials* (DOE-STD-3013-2004) provides criteria for stabilization of plutonium-bearing materials in safe and stable forms that can be packaged and placed in storage requiring minimal surveillance for up to 50 years. Therefore, this standard, and the surveillance to ensure compliance with this standard, is focused on the 50-year storage goal. Implementation of the proposed Surplus Plutonium Disposition Program would result in the disposition of stored plutonium, such that storage of these materials for 50 years would not be needed.

Immobilization Capability at the Savannah River Site

Commentors stated their preference for immobilization and storage for economic, safety, and nonproliferation reasons, stating that, compared to the MOX Fuel Alternative, immobilization is better tested, safer, more timely, more cost effective, simple, clean, and final. Commentors suggested that DOE reconsider the 2002 decision to cancel the immobilization facility and some suggested that DOE revive the ceramic immobilization disposition path. As described in Chapter 2, Section 2.3.2, of the *SPD Supplemental EIS*, DOE evaluates the Immobilization to DWPF Alternative for the additional surplus plutonium inventory, although this section also recognizes that immobilizing the entire 13.1 metric tons (14.4 tons) may not be feasible due to limitations on the amount of HLW glass available at the Defense Waste Processing Facility (DWPF) and the timing of DWPF closure. As described in Section 2.4, immobilization of 50 metric tons (55 tons) was analyzed in the *SPD EIS* (DOE 1999) and is not being reconsidered, and, in any case, is not feasible due to the limitations on DWPF operations. As stated in Section 2.4.1, DOE is not analyzing in detail the ceramic immobilization approach.

Immobilized waste will need to be stored before disposal. Commentors stated that hardened storage should be analyzed for immobilized wastes to protect them from risks posed by natural or manmade disasters and terrorist attack. As described in Appendix B, Sections B.1.4.1 and B.1.4.2, of the *SPD Supplemental EIS*, canisters containing cans of immobilized surplus plutonium would be filled with HLW and stored in the Glass Waste Storage Buildings at SRS. These buildings have controls and engineered safeguards required by safety assessments that examine the potential for, and consequences of, accidents caused by natural phenomena and manmade events. The presence of immobilized plutonium in the canisters is not expected to appreciably change their performance in severe accidents and these wastes would not be considered an attractive target for terrorist attack. DOE considers risks associated with security and safety to determine whether or not a hardened structure is required. DOE does not believe that additional hardening of the Glass Waste Storage Buildings is needed to safely store immobilized waste containing surplus plutonium.

Pit Disassembly and Conversion Project and Plutonium Preparation Capability at the Savannah River Site

Commentors were concerned that construction of a pit disassembly and conversion capability at SRS could result in another expensive, excess facility. As described in Chapter 1, Section 1.4, of the *SPD Supplemental EIS*, DOE is revisiting its previous decision to construct a stand-alone PDCF at SRS. See Chapter 2, Section 2.1, for a description of the pit disassembly and conversion options that DOE currently evaluates in the *SPD Supplemental EIS*. Construction of a stand-alone pit disassembly and conversion capability at SRS is analyzed in the *SPD Supplemental EIS*. The *SPD Supplemental EIS* also analyzes options for pit disassembly and conversion that would involve modifications to existing facilities at LANL and SRS. DOE's preferred option is to use some combination of facilities at TA-55 at LANL, and K Area, H-Canyon/HB-Line and MFFF at SRS, rather than to construct a stand-alone PDCF, at SRS, thereby avoiding construction of another facility.

Commentors were concerned that combining the DOE Office of Environmental Management (DOE-EM) plutonium preparation and disposition activities and National Nuclear Security Administration (NNSA) pit disassembly and conversion capabilities may adversely affect the cost, schedule, or conduct of these activities at SRS. In the amended NOI issued on January 12, 2012 (77 FR 1920), DOE modified the options to be evaluated in the *SPD Supplemental EIS*. The *SPD Supplemental EIS* describes the impacts of alternatives that combine four options for pit disassembly and conversion and four options for plutonium disposition. Plutonium preparation is included as part of the plutonium disposition options analyzed. DOE examines combining some NNSA and DOE-EM activities, in part, to reduce costs and maximize operational efficiency. DOE does not believe that combining DOE-EM and NNSA capabilities would adversely affect the cost, schedule, or conduct of these activities at SRS.

Pit Disassembly and Conversion Facility at the Savannah River Site

Commentors were concerned that the construction schedule for PDCF may not be compatible with the MFFF startup schedule. The startup of MFFF would occur using as feed material existing surplus plutonium oxide currently in storage at SRS, plutonium oxide being produced at H-Canyon/HB-Line (DOE 2012), and plutonium oxide produced as early feed at LANL (DOE 2008). MFFF would be operated using these sources of material until plutonium oxide from facilities performing pit disassembly and conversion is available.

Pit Disassembly and Conversion Capability at Los Alamos National Laboratory

Commentors were opposed to using LANL to process materials for MFFF. Commentors expressed concern about the quantity of plutonium oxide to be produced for the MOX program at LANL and whether the impacts of activities at LANL are analyzed in the* SPD Supplemental EIS*. Commentors requested that the risks and uncertainties of expanded pit processing in PF-4 at LANL be discussed in detail, and that a new technical basis for seismic impacts be prepared, to address handling and processing of larger amounts of plutonium, especially in the more dispersible oxide form. Commentors were concerned that the timeline for upgrading to an active ventilation system (2020) is too far in the future. Chapter 4 and Appendix F of the *SPD Supplemental EIS* include analyses of the environmental impacts and human health risks of expanded pit disassembly and conversion in PF-4 at LANL, including the effects of handling larger quantities of plutonium in metal and oxide form. Appendix D, Section D.1.5.2.11, describes the completed and planned seismic upgrades to PF-4. The accident analyses in the *SPD Supplemental EIS* consider the current state of PF-4 without future upgrades.

MOX Fuel Fabrication Facility at the Savannah River Site

Commentors suggested that DOE call "MOX fuel" something more descriptive, such as "plutonium bomb fuel" or "mixed uranium plutonium fuel." "MOX fuel" has been the accepted term for reactor fuel fabricated from a mixture of plutonium oxide and depleted uranium oxide in the United States, Europe, Japan, and Russia since the 1960s. Traditional uranium oxide fuel used in reactors has a significant amount of plutonium created in it as a result of neutron capture by uranium-238 isotopes and this plutonium provides a significant amount of power to traditional uranium-fueled reactors. Therefore, even traditional uranium oxide fuel contains plutonium soon after irradiation begins.

Commentors expressed concern regarding the MOX fuel fabrication program, including concerns about construction problems, public health and safety dangers, economic costs, funding, and schedule. Commentors expressed concern about potential environmental, human health, and economic impacts associated with MOX fuel fabrication and waste generation. There has been no significant safety or

environmental issues in the ongoing construction of MFFF. The potential environmental impacts of construction and operation of MFFF were evaluated in the SPD EIS (DOE 1999) and the Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina (NRC 2005). NRC published a Final Safety Evaluation Report in December 2010 for the license application to possess and use radioactive material at MFFF (NRC 2010). The NRC staff concluded that the design and operation of the MOX facility would not pose an undue risk to worker and public health and safety. Appendix I, Sections I.1 and I.2, of the SPD Supplemental EIS present an analysis of the potential environmental, human health, and socioeconomic impacts associated with the use of MOX fuel in the TVA reactors, and in a generic reactor located in the United States because DOE is continuing to pursue MOX fuel use in additional domestic commercial nuclear power reactors. The cost and funding of the MOX fuel program are outside the scope of the SPD Supplemental EIS.

Commentors had numerous questions about MFFF. For example: When is MFFF expected to be completed? How close to the Savannah River is MFFF? Commentors suggested the inclusion of a table showing the annual requirement for MOX feed starting in 2016 through program completion and the facilities providing the MOX feed. Chapter 2 and Appendix B of the SPD Supplemental EIS describe the facilities that may be used for surplus plutonium disposition, including MFFF. MFFF is under construction at SRS. Significant progress continues to be made on the construction of the MFFF, with design approximately 90% complete and construction more than 50% complete. DOE is in the process of formally evaluating and preparing a proposed change to the cost and schedule baseline for the project.

At its nearest point, MFFF is over 7 miles (11 kilometers) from the Savannah River. Additional information on the MOX Fuel Program may be found on the MFFF website at http://www.moxproject.com/ and the NRC website at http://www.nrc.gov/materials/fuel-cycle-fac/mox/faq.html. As shown in Appendix B, Table B–3, the maximum annual throughput for MFFF is 3.5 metric tons (3.9 tons) of plutonium per year. The analyses in the *SPD Supplemental EIS* are based on this maximum throughput.

Commentors expressed concern that much of the surplus plutonium may be unsuitable for use in MOX fuel. A commentor asked that DOE describe where the MOX fuel would be assembled and asked whether LTAs would be manufactured at MFFF. Chapter 1, Section 1.5, of the *SPD Supplemental EIS* describes the surplus plutonium materials that are the subject of the study. Analyses of the surplus plutonium inventories indicate that all of the pit plutonium and much of the non-pit plutonium is usable in MOX fuel. The plutonium introduced into the MOX process must meet MOX fuel specifications and cannot contain certain impurities or contaminants. Approximately 2 metric tons (2.2 tons) of surplus non-pit plutonium contain such impurities (i.e., cannot be made into MOX fuel). Other alternatives for the disposition of the plutonium, including that plutonium which is not suitable for fabrication into MOX fuel, are described in Chapter 2. As described in Appendix B, Section B.1.1.2, MOX fuel would be pressed into pellets, the pellets assembled into fuel rods, and the fuel rods assembled into fuel bundles in MFFF at SRS. Once MFFF is operational, test assemblies for any future reactor testing of MOX fuel, if required, would be prepared at MFFF.

A commentor asked how tritium and gallium are going to be removed from MOX feedstock and where tritium recycling will take place. Details of the processes on removal of tritium are classified. As described in Appendix B, Section B.1.1.2, of the *SPD Supplemental EIS*, gallium will be removed via the aqueous polishing process in MFFF.

Commentors were concerned that MFFF was cited by NRC for numerous violations, including using substandard construction materials in the foundation and improperly documenting design changes. NRC has identified findings that are classified as low, but more than minor, safety significance. These

are classified as Level IV violations—the lowest level of NRC cited violations. In each instance, MOX Services has addressed the findings in accordance with its corrective action program. Also, unless the corrective actions were verified by NRC during the inspection period, MOX Services prepares a response to NRC on each finding. Each response includes (1) the reason for the violation, (2) corrective steps that have been taken and the results achieved, (3) the corrective steps taken to preclude further violations, and (4) the date when full compliance will be achieved. The violations remain open until NRC assesses the implementation of the corrective actions subsequent to the full compliance date. Currently, most violations have either been closed by NRC or are pending NRC verification (i.e., items committed to NRC in violation responses have been completed, but NRC has not yet performed its independent inspection). MFFF is being constructed under the NRC construction authorization and will operate under an NRC license.

Commentors requested that DOE discuss potential use of MFFF beyond the publicly stated mission of producing MOX fuel for light-water reactors (LWRs), as well as explain any modifications to MFFF that are required to provide MOX fuel to generic reactors, next-generation LWRs, fast reactors, or small modular reactors and the associated NRC licensing impacts. Commentors also asked how MOX fuel would be made to the specifications of the various low-enriched uranium (LEU) vendors. As described in Appendix B, Section B.1.1.2, of the *SPD Supplemental EIS*, and analyzed in the *Interim Action Determination, Flexible Manufacturing Capability for the Mixed Fuel Fabrication Facility* (DOE 2011a) signed on April 1, 2011, MOX fuel could be fabricated for use in LWRs such as boiling-water reactors (BWRs) or pressurized-water reactors (PWRs). There are currently no plans to fabricate fuel for other types of reactors. DOE anticipates that MOX fuel could be supplied to other BWRs and PWRs (referred to in the *SPD Supplemental EIS* as "generic reactors") beyond the TVA reactors analyzed in the *SPD Supplemental EIS*.

Commentors expressed concern about the impacts caused by the lack of MOX fuel customers, asking DOE to explain if other utilities are in discussion to use MOX fuel in their nuclear power reactors and if there are any new approaches to marketing MOX fuel. A commentor asked how unused MOX fuel rods would be stored and eventually disposed of. TVA has signed a letter of intent and DOE and TVA have entered into an Interagency Agreement to evaluate the use of MOX fuel in up to five operating TVA reactors, including PWRs (Sequoyah Nuclear Plant) and BWRs (Browns Ferry Nuclear Plant). DOE continues to actively pursue other potential customers as well. New approaches to marketing MOX fuel are also being pursued. DOE and MOX Services are pursuing an arrangement with an established fuel fabrication vendor to take the lead role in marketing MOX fuel. MOX Services has executed an agreement with Pacific Northwest National Laboratory to study MOX fuel using a Global Nuclear Fuel – Americas, LLC, core design in a BWR. Other utilities have expressed interest in using MOX fuel in their reactors. DOE is confident in its ability to find utilities willing to use MOX fuel in their nuclear power reactors. MFFF will not produce MOX fuel on a commercial scale unless contracts or other arrangements are in place for its use.

A commentor questioned why is it so critical to not have a delay in beginning MFFF operations. It is important that MFFF begin operations to demonstrate progress to the Russians and the International Atomic Energy Agency in accordance with agreements, to meet production dates and requirements directed by Congress, and to reduce the quantity of surplus plutonium and the concomitant cost of storage. In addition, DOE has determined that it is more efficient to operate MFFF continuously, rather than to stop operations for an extended period of time.

A commentor asked where the eight MOX fuel assemblies mentioned in the NNSA Fiscal Year 2013 (FY13) budget are going to be used. The eight fuel assemblies mentioned in the NNSA FY13 budget would be the first assemblies produced at MFFF. The use of those assemblies will be determined upon entering in fuel sales agreements.

Commentors were concerned that DOE's Surplus Plutonium Disposition Program is being manipulated by special interests, such as the French company AREVA. AREVA has substantial international experience fabricating MOX fuel and, therefore, is a valuable asset in designing and constructing MFFF. DOE's work with AREVA on MFFF is subject to the requirements of Federal contracting regulations and other applicable requirements, and the MFFF must be licensed by NRC.

MOX Fuel Fabrication Facility – Plutonium Oxidation

Commentors were concerned about the impact on MFFF of adding a plutonium oxidation mission. Questions included: How will MFFF's design be changed? Will the modification affect the planned 2016 startup date for MFFF? Appendix B, Section B.1.1.2, of the *SPD Supplemental EIS* describes the oxidation furnaces that could be added to MFFF. DOE anticipates that addition of the oxidation furnaces would not affect the startup date for MFFF; the impacts of installation and operation of the oxidation furnaces at MFFF are described in Appendix F.

H-Canyon/HB-Line at the Savannah River Site – Pit Conversion

Commentors requested technical details regarding the ability to use H-Canyon/HB-Line to process pits, including information regarding which types of pits would be processed, which dissolver line would be used, necessary upgrades, criticality concerns, worker dose, waste streams, and risks and uncertainties, including the impacts of a rapid shutdown. Commentors asked if a risk assessment has been completed for H-Canyon and about what has been done to address the contamination, possible leaks, and any other maintenance problems. Appendix B, Section B.1.3, of the *SPD Supplemental EIS* describes conversion of pit plutonium at H-Canyon/HB-Line. The environmental impacts and human health risks of conversion of pit plutonium at H-Canyon/HB-Line are described in Appendix F, including waste management impacts and worker dose and risk. More detailed information on the human health risks from normal operations is given in Appendix C, while criticality and other potential accidents involving conversion of pit plutonium at H-Canyon/HB-Line are described in Appendix D. The assessment of risks from operation of H-Canyon/HB-Line for conversion of pit plutonium takes into account the current condition of the facility.

Commentors requested more information on the role of K-Area in pit processing, including pit storage, methods for declassifying and cutting up pits, criticality issues, impacts of pit handling on other K-Area missions, worker dose, and the security aspects of pit transport. Appendix B, Section B.1.2.5, of the *SPD Supplemental EIS* describes pit disassembly at K-Area. The environmental impacts and human health risks of pit disassembly at K-Area are described in Appendix F, including worker dose and risk. More detailed information on the human health risks of pit disassembly at K-Area under normal operations and accidents is given in Appendices C and D, respectively. The impacts of transporting pits to K-Area are described in Appendix E. The impacts of intentional destructive acts are summarized in Chapter 4, Section 4.1.2.5. Pit handling activities are not expected to affect other K-Area missions.

H-Canyon/HB-Line at the Savannah River Site – Processing for the Waste Isolation Pilot Plant

Commentors requested information on how plutonium is being packaged at HB-Line for disposal at WIPP, including packaging capacity, criticality risks, waste streams, the condition of aging HB-Line equipment, worker dose, shipment schedules, and how WIPP waste acceptance criteria will be met. Commentors stated that the nature of the material mixed with the plutonium also must be discussed. Appendix B, Section B.1.3, of the *SPD Supplemental EIS* describes plutonium processing at H-Canyon/HB-Line for WIPP disposal, including the material that would be mixed with the plutonium,

packaging, and equipment modifications. The environmental impacts and human health risks of plutonium processing for WIPP disposal are described in Appendix G, including waste management impacts and worker dose. More detail on the human health risks from normal operations and accidents of plutonium processing for WIPP disposal are described in more detail in Appendices C and D, respectively, including consideration of criticality accidents. Transportation of packages to WIPP is described in Appendix E; because of security concerns, detailed shipment schedules are not appropriate for a public document. Notification of pending shipments would be given to state and Federal agencies in accordance with existing regulations and agreements. Impacts on WIPP TRU waste disposal capacity are described in Chapter 4, Section 4.5.3.6.3.

Defense Waste Processing Facility at the Savannah River Site

Commentors questioned the status of the DWPF vitrification plant. Examples included: What is the vitrification plant capacity? How does vitrification of plutonium differ from HLW? Where would plutonium vitrification products be stored? Where would vitrified waste be disposed of? How does the DWPF vitrification process differ from that proposed for the Hanford Nuclear Reservation? Appendix B, Section B.1.4.1, of the *SPD Supplemental EIS* describes the filling of canisters with HLW at DWPF. As described in Chapter 3, Section 3.1.10.2, DWPF is operating and is currently filling approximately 210 canisters per year. Under the Immobilization to DWPF Alternative, the annulus of canisters containing immobilized plutonium in can-in-canister assemblies would be filled with HLW at DWPF. Under the H-Canyon/HB-Line to DWPF Alternative, canisters would be filled with vitrified HLW containing plutonium dispersed within the glass; plutonium metal would be dissolved in H-Canyon before vitrification. Under either alternative, canisters containing immobilized surplus plutonium with HLW would be stored in the Glass Waste Storage Buildings at SRS. The DWPF vitrification process is similar to that proposed for use at the Waste Treatment Plant at the Hanford Site.

A commentor expressed concern that, in order to process more plutonium through DWPF, DOE must ensure that it will not impede completion of HLW vitrification and that the current limit of 897 grams of plutonium per cubic meter of glass will be increased. As described in Appendix B, Section B.1.4.1, and analyzed in Appendix G of the *SPD Supplemental EIS*, DOE has analyzed the potential environmental impacts of increasing the plutonium loading in DWPF canisters. DOE's analysis limits the plutonium going to DWPF in order to not affect the DWPF completion schedule and analyzes increasing plutonium loading in DWPF canisters to 5,400 grams per cubic meter.

Waste Isolation Pilot Plant

Commentors were concerned about surplus plutonium disposal at WIPP. Questions included: Would the capacity of WIPP have to increase to handle an additional 6 metric tons (6.6 tons)? What would be the waste form characteristics for the plutonium? How would additional plutonium affect WIPP's operations? Would the waste meet WIPP waste acceptance criteria? Would a change in the WIPP Land Withdrawal Act or other existing laws be necessary? Would the waste comply with all provisions of the WIPP Hazardous Waste Act permit? What would be the impacts on the WIPP performance assessment and would changes be required in the Compliance Recertification Application? What are the transportation impacts and cumulative impacts? What would be the schedule for bringing the waste to WIPP? Will international inspections be required? Appendix B, Section B.3, of the *SPD Supplemental EIS* describes disposal of plutonium at WIPP, including the waste forms to be disposed. Section B.1.3 describes the processing that would be used to meet WIPP waste acceptance criteria. As described in Chapter 4, Section 4.5.3.6.3, neither the TRU waste disposal capacity at WIPP nor the waste acceptance criteria would be exceeded. Impacts from TRU waste disposal at WIPP are analyzed in the Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (WIPP

SEIS) (DOE 1997b) and briefly described in Appendix A, Section A.2. Because WIPP capacity and waste acceptance criteria would not be exceeded, the impacts of disposal would remain within the environmental impacts analyzed in the *WIPP SEIS*. Because WIPP capacity would not be exceeded and the WIPP waste acceptance criteria would be complied with, there would be no need to revise the WIPP Land Withdrawal Act and EPA and state authorization bases. The impacts of transportation of waste packages to WIPP are described in Appendix E; because of security concerns, detailed shipment schedules are not appropriate for a public document. International inspections would not be required for TRU waste disposed of at WIPP. Additional information about WIPP is located at http://www.wipp.energy.gov/.

Commentors were concerned that changes in existing laws would be required, including the Congressional appropriations act requirements that prohibited funds for disposal at WIPP of plutonium in excess of 20 percent by weight for the aggregate of any material category on the date of enactment of the act, or any material generated after such a date. First enacted in the Energy and Water Development Appropriations Act in 1999, the general provision limitation of 20 percent plutonium was reenacted through FY06. In FY07, the enactment of multiple continuing resolutions continued the provision. However, in FY08 and beyond, no general provisions limiting plutonium concentrations in TRU wastes sent to WIPP have been enacted. Therefore, the prior limitation is no longer applicable. Although the provision was originally incorporated into the WIPP waste acceptance criteria, the waste acceptance criteria were subsequently revised in February 2009 to remove the limitation after the provision was no longer applicable.

Commentors expressed concern about the environmental impacts of processing, transportation, and disposal of non-pit plutonium at WIPP. Chapter 4 and Appendix G of the *SPD Supplemental EIS* present the analysis of the impacts of processing at SRS of non-pit plutonium for WIPP disposal. The impacts of transportation of waste packages to WIPP are described in Appendix E. The impacts of disposal of up to 175,600 cubic meters (6.2 million cubic feet) of waste are presented in the *WIPP SEIS* (DOE 1997b), and briefly described in Appendix A, Section A.2. As described in Section 4.5.3.6.3, the quantities of TRU waste produced by surplus plutonium disposition, when added to the amount of TRU waste already planned for disposal at WIPP, would not exceed the amount analyzed in the *WIPP SEIS*.

Commentors expressed concern that the residents of New Mexico were previously told that WIPP would not accept HLW or radioactive materials. DOE is evaluating reasonable alternatives, including disposal at WIPP, for disposition of some of the surplus plutonium. WIPP is a facility that is certified to dispose of TRU wastes and has been doing so safely for more than 10 years. Only material that meets the WIPP waste acceptance criteria would be considered for disposal at WIPP. Surplus plutonium is not HLW.

Commentors from the state of South Carolina asked for a Memorandum of Understanding between DOE and the State of New Mexico to prove that New Mexico will accept the plutonium at WIPP. Some of the up to 6 metric tons (6.6 tons) of plutonium being analyzed for disposal at WIPP contains higher levels of impurities that would preclude its use as MOX fuel. As long as the resulting waste form meets the WIPP waste acceptance criteria, DOE does not see the need for any additional agreements for acceptance of this plutonium-containing waste at WIPP.

Commentors expressed concern about how the Russians would view disposal of U.S. surplus plutonium at WIPP. The United States remains committed to the Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated As No Longer Required for Defense Purposes and Related Cooperation (PMDA), under which both the United States and the Russian Federation have each agreed

to dispose of at least 34 metric tons (37.5 tons) of excess weapons-grade plutonium in nuclear reactors to produce electricity.

Geologic Repository for High-Level Radioactive Waste and Used Nuclear Fuel

Commentors expressed concern about the adverse impacts of DOE's decision to discontinue work on the Yucca Mountain geologic repository, and DOE's responsibility to establish options to mitigate the effect of the Yucca Mountain decision. Commentors asked DOE to provide a clear description of the disposition plans for used MOX fuel and immobilized plutonium. As discussed in Appendix I, section 1.1.2.4, of the *SPD Supplemental EIS*, used MOX fuel would be managed in the same manner as used LEU fuel. Also, as discussed in the *SPD Supplemental EIS*, DWPF canisters containing vitrified plutonium with HLW would be stored in GWSBs; these DWPF canisters would be managed in the same manner as other DWPF canisters containing HLW. Although the Secretary has determined that Yucca Mountain is not a viable option for a geologic repository, the Department remains committed to meeting its obligations to safely dispose of used nuclear fuel and HLW. As the Secretary made clear in his statements following the release of the Blue Ribbon Commission on America's Nuclear Future (BRC) report, DOE believes the Commission's recommendations outline a sensible and practical approach to solving the challenges associated with the management and disposition of commercial and defense high-level radioactive materials. The consensus report is a critical step toward finding a sustainable approach to dispositioning these materials. The Department has been reviewing these recommendations and is expected in the near future to report a new strategy building on the work of the BRC.

Commentors requested that the* SPD Supplemental EIS *describe the thermal impacts of used MOX fuel on any interim storage facility or geologic repository. Commentors further requested that the type of disposal package and the number of used MOX fuel assemblies per package be described, as well as the decay heat levels at the time of MOX fuel placement in the repository. As described in Appendix I, Section I.1, of the *SPD Supplemental EIS* each LEU fuel and MOX fuel assembly would be discharged from the reactor with its own unique burn-up level and decay heat. The used fuel assemblies would be placed in the used fuel pool to reduce decay heat. When the decay heat reaches appropriate levels, the used fuel assemblies could be moved to dry storage casks. By the time used fuel assemblies are ready for dry storage, the decay heat for the LEU and MOX fuel assemblies would be similar. DOE anticipates that MOX fuel and LEU fuel assemblies would be managed similarly. Storage of used fuel at TVA's Browns Ferry and Sequoyah Nuclear Plants was analyzed in the NEPA documents prepared for these reactors (see Appendix A, Section A.3).

MOX Fuel Use in Reactors

Commentors expressed concern that the use of MOX fuel in commercial nuclear power plants is an immature technology that would require extensive analysis, simulations, and testing at a remote location far from any population centers before testing could be done at a commercial nuclear power reactor. Commentors also expressed concern about the lack of information on MOX fuel use in BWRs and the lack of information on weapons-grade MOX fuel. MOX fuel use in commercial reactors is a demonstrated technology that has been used worldwide for over 40 years. MFFF is based on the proven design and operations of the French MELOX plant. MOX fuel was first used in a thermal reactor in 1963 and in a commercial reactor in 1987. Today, MOX fuel is routinely used around the world, with roughly 2,000 metric tons (2,200 tons) of MOX fuel already fabricated and loaded into power reactors, including PWRs and BWRs. MOX fuel is widely used across Europe. Currently, about 40 reactors in Belgium, Switzerland, Germany, and France are licensed to use MOX fuel, and more than 30 are presently doing so. These reactors generally use MOX fuel in about one-third of their core, although some are licensed to use MOX fuel in as much as half of their core.

MOX fuel LTAs were tested in Duke Energy's Catawba Nuclear Station. As described in Appendix J, Section J.2, of the *SPD Supplemental EIS*, postirradiation examination results confirm that MOX fuel containing weapons-grade plutonium performed as expected, and establish the relevance of the European MOX fuel experience using reactor-grade plutonium.

Commentors expressed concern about the use of MOX fuel in commercial nuclear power plants, citing the following reasons: (1) the MOX approach is likely to be far more expensive and take far longer to complete than immobilization; (2) there are concerns about using conventional uranium fuel in a plant that has previously used MOX fuel; and (3) MOX fuel has a low burn-up rate. As described in Chapter 2, Section 2.3.2, of the *SPD Supplemental EIS*, the immobilization capability requires that can-in-canister assemblies be filled with HLW glass in DWPF to provide a nuclear proliferation barrier. As described in Section 2.3.2, the *SPD Supplemental EIS* evaluates the Immobilization to DWPF Alternative for the additional surplus plutonium inventory, although this section also recognizes that immobilizing the entire 13.1 metric tons (14.4 tons) may not be feasible due to limitations on the amount of HLW glass available at DWPF and the timing of DWPF closure. The cost of implementing the MOX Fuel Alternative or any of the alternatives included in the *SPD Supplemental EIS* is outside the scope of this analysis, but may be one of the factors considered by DOE when making a decision on which alternative or alternatives to implement in the ROD following the *SPD Supplemental EIS*. There are no concerns associated with using uranium fuel in a reactor that has previously used MOX fuel. MOX fuel would likely be used in only 30 to 40 percent of the reactor core. The remaining 60 to 70 percent of the core would contain LEU fuel. In France, MOX fuel is licensed for the same maximum burn-up as LEU fuel and it is expected that eventually this can be achieved in the United States. The higher burn-up is better for fuel economics, although lower burn-up can still achieve compliance with the self-protection goals of the Spent Fuel Standard.

Commentors expressed concern about the use of MOX fuel in commercial nuclear power plants, including differences in the chemistry and physics between uranium fuel and MOX fuel during power production and shutdown. While DOE acknowledges that there are differences in MOX fuel compared to LEU fuel, these differences are not expected to decrease reactor safety. All relevant factors are being evaluated by TVA, in its due diligence, to ensure that its reactors can continue to operate safely if they were to use MOX fuel. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by TVA or other reactor operators, as part of the 10 CFR Part 50 or Part 52 license amendment process. Differences between MOX fuel and LEU fuel are well known and can be accommodated through fuel and core design. All of the TVA reactors identified as potential candidates for the MOX fuel mission have a comprehensive program of reactor vessel analysis and surveillance in place to ensure that NRC reactor vessel safety limits are not exceeded.

Commentors requested information on plutonium transformation in the reactors, including how much plutonium would be in the fresh MOX fuel and how much plutonium would remain when the fuel is withdrawn. The footnote in the introduction to Chapter 2 of the *SPD Supplemental EIS* provides a description of the amount of plutonium-239 in fresh MOX fuel and the reduction in plutonium-239 after irradiation in a nuclear power reactor. In addition, Appendix J, Section J.2.2, compares the radionuclide inventory in a full LEU core to that in a partial MOX fuel core.

Commentors expressed concern that plutonium in fresh MOX fuel assemblies is still weapons-usable material. How much it is going to cost to guard the used MOX fuel that would be produced? Although plutonium in fresh MOX fuel assemblies is still weapons-usable material until irradiated sufficiently to meet the Spent Fuel Standard, the plutonium in the fresh MOX assemblies is protected from theft by physical security, the size and weight of the assemblies, encapsulation in zirconium alloy rods, incorporation into ceramic pellets, and the low percentage of plutonium oxide mixed with depleted

uranium oxide, making diversion of plutonium extremely difficult. Used (i.e., irradiated) MOX fuel is very similar to used uranium fuel. Both are self-protecting and have the same nonproliferation profile. That is, the high level of radiation given off by the irradiated fuel protects the fuel from theft or diversion. Therefore, used MOX fuel would be stored in the same manner as used uranium fuel, with no significant difference in storage or security costs.

Commentors expressed concern that the energy benefit of using plutonium in commercial power reactors is not worth the risk. The *Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated As No Longer Required for Defense Purposes and Related Cooperation* (referred to as the "PMDA") was first signed in 2000, with two protocols in 2006 and 2010, and entered into force in 2011. The United States remains committed to the PMDA between the United States and the Russian Federation, under which both countries have agreed to each dispose of at least 34 metric tons (37.5 tons) of excess weapons-grade plutonium in nuclear reactors to produce electricity. Chapter 4 and supporting appendices of the *SPD Supplemental EIS* include analyses and discussions of the risks associated with the use of MOX fuel, including impacts on air quality, human health, socioeconomics, waste management, land resources, geology and soils, water resources, noise, ecological resources, cultural resources, and infrastructure.

Commentors expressed concern that the United States may be sending MOX fuel to Canadian reactors. DOE currently is not considering using U.S. MOX fuel in Canadian reactors or any other foreign reactors.

A commentor suggested that DOE design a reactor that can use MOX fuel as its only fuel source. Some commentors suggested that DOE needs an aggressive program for reprocessing used fuel. DOE has no plans to design, construct, and operate a reactor for the sole purpose of irradiating MOX fuel and disposing of plutonium (i.e., a fast flux reactor). Domestic commercial nuclear power reactors have sufficient safety and operating margins to allow for the use of MOX fuel. This provides the quickest and safest route to disposition surplus plutonium as MOX fuel. Fast flux reactors that only use MOX fuel are in the experimental phase at this time. Although used (irradiated) nuclear fuel is not currently reprocessed in the United States, this activity has been occurring overseas for many decades.

Commentors requested that NRC's role in licensing the use of MOX fuel in commercial nuclear power reactors be explained. Amendment to each reactor's operating license may be required prior to MOX fuel being brought to the reactor sites and loaded into the reactors. NRC regulations related to operation of commercial nuclear power reactors are described in Chapter 5, Section 5.3.3, of the *SPD Supplemental EIS*. Domestic commercial nuclear power reactors undergo a rigorous licensing process under "Domestic Licensing of Production and Utilization Facilities," (10 CFR Part 50), or "Licenses, Certifications, and Approvals For Nuclear Power Plants", (10 CFR Part 52), beginning before facility construction and continuing throughout operation. This process includes preparation of safety analysis reports and environmental reports under 10 CFR Part 51, including the appropriate NEPA-related reviews. Public meetings are regularly held in conjunction with plant licensing, and opportunities would be available for public hearings before any license amendment is issued. Once issued, operating licenses may be amended only with proper NRC evaluation, review, and approval. This process requires demonstration that a proposed change does not involve an unreviewed environmental or safety question and provides for public notice and opportunity to comment before issuance of the license amendment. In addition, the Advisory Committee for Reactor Safeguards may review and report on safety studies and reactor facility license renewal applications.

MOX Fuel Use in Reactors – Duke Energy/Virginia Power

Commentors expressed concern about the reasons Duke Energy and Virginia Power abandoned MOX fuel use in their reactors and that this could also happen with TVA's reactors. Virginia Power withdrew from the MOX fuel program in April 2000. The DOE subcontract between Duke Energy and MOX Services automatically terminated in accordance with its terms on November 31, 2008. Subsequently, TVA signed a letter of intent, and DOE and TVA entered into an Interagency Agreement to evaluate the use of MOX fuel in TVA reactors. DOE continues to actively pursue the use of MOX fuel by other potential reactor operators as well.

MOX Fuel Use in Reactors – Lead Test Assemblies

Commentors expressed concern about the lead assembly testing at Duke Energy's Catawba reactor, the implications of this "failed" test, and how the "failed" test would be addressed in the TVA reactors. As described in Appendix J, Section J.2, of the *SPD Supplemental EIS,* MOX fuel lead assemblies were successfully tested in Duke Energy's Catawba Nuclear Station Unit 1 reactor. Four MOX LTAs were fabricated by AREVA in France from U.S.-origin weapons-usable plutonium. Starting in 2005, these assemblies were irradiated for two 18-month fuel cycles in the Catawba Nuclear Station Unit 1 reactor. Irradiation for two cycles is consistent with licensing requirements for MOX fuel. After two cycles of irradiation, the length of some of the fuel assemblies slightly exceeded a criterion that had been selected in advance to ensure safe irradiation for a planned, but not required, third cycle and the assemblies were removed from the reactor vessel. The extra length was less than the thickness of a dime. The fuel assembly design process was subsequently changed to improve control of assembly length. The four MOX fuel lead assemblies performed safely; no safety limits were exceeded.

Commentors expressed concern that NRC-licensed tests of LTAs would need to be conducted in the TVA reactors. Commentors asked DOE to describe the process for conducting these tests at the Browns Ferry and Sequoyah Nuclear Plants, including the source of plutonium feedstock that would be used to fabricate LTAs, where the MOX LTAs would be produced, the schedule for LTA fabrication and testing, and the location of any postirradiation examination. The need for future LTAs based on the reactor's planned use of MOX fuel (burn-up levels) will be determined in the future as part of the fuel qualification and licensing process. If MOX fuel LTAs are required, they would likely be fabricated at MFFF from feed stock supplied by the existing plutonium inventory. There is currently no schedule for LTA fabrication and testing. If required, postirradiation examination could be performed at the Oak Ridge National Laboratory.

A commentor stated that NRC regulations require testing to the burn-up level being sought for licensing. Basing MOX fuel use on the Duke Energy lead assemblies test may mean that MOX fuel will be restricted to two fueling cycles, when most LEU fuel remains in the reactor for three cycles. NRC typically licenses fuel to a maximum burn-up limit and not a given number of cycles. In France, MOX and LEU fuel are currently licensed to the same burn-up limit. The need for future LTA testing based on the reactor's planned use of MOX fuel (burn-up levels) will be determined in the future as part of the fuel qualification and licensing process.

Generic Reactors

Commentors were concerned about MOX fuel use in aging nuclear power plants. Commentors stated that any plans to test or use MOX fuel in units named by NRC as needing additional regulatory oversight must be discussed in the* SPD Supplemental EIS*, which also must include analysis of a scenario in which NRC's oversight process required shutdown of any of the reactors being proposed

for MOX testing and use. Use of MOX fuel in a domestic commercial nuclear power reactor will be under the terms of an NRC license. NRC will issue the license when it is satisfied that the reactor can operate safely and within all design parameters. DOE plans to enter into agreements for the use of MOX fuel in multiple reactors so that any potential interruption of its use at one reactor would not significantly disrupt the overall Surplus Plutonium Disposition Program.

Commentors asked DOE to explain what is meant by a "generic reactor." Commentors also were concerned about MOX fuel use in new untested designs and asked which utilities beyond TVA and Energy Northwest are being pursued for MOX use. DOE anticipates that MOX fuel could be supplied to other BWRs and PWRs beyond the TVA reactors analyzed in the *SPD Supplemental EIS*. These unspecified reactors are referred to as "generic reactors." As described in Appendix B, Section B.1.1.2, of the *SPD Supplemental EIS*, and analyzed in the *Interim Action Determination, Flexible Manufacturing Capability for the Mixed Fuel Fabrication Facility* (DOE 2011a), signed on April 1, 2011, MOX fuel could be fabricated for BWRs or PWRs. There are currently no plans to fabricate fuel for other types of reactors. DOE is not limiting the potential use of MOX fuel to a subset of domestic commercial reactors. DOE would entertain interest from any U.S. utility regarding use of MOX fuel in its reactors.

Tennessee Valley Authority Reactors

Commentors expressed concern about past problems and current safety issues at TVA's Browns Ferry and Sequoyah Nuclear Plants, including poor operational records, unplanned shutdowns, notices of violation, prematurely aged containment structures, failure to provide fire protection features capable of limiting fire damage, overworked plant employees, site security issues, and contamination hot spots. Commentors stated that the identified problems should eliminate these two TVA power plants from further consideration for plutonium disposition. TVA's reactors are licensed by NRC to operate safely, and NRC would perform a comprehensive safety review before MOX fuel could be used. Ultimately, NRC would make any decisions related to future use of MOX fuel in TVA reactors as a result of this review process. TVA will continue to fulfill its responsibilities to its customers and neighbors to operate its reactors within its NRC-approved operating licenses whether it is using a partial MOX fuel core or a full uranium fuel core. As described in Appendix I, Section I.1, of the *SPD Supplemental EIS*, the impacts of the use of a partial MOX fuel core are not expected to be substantially different from the impacts of normal reactor operation using a conventional full uranium fuel core.

Commentors were concerned that TVA's nuclear plants are already oversubscribed to DOE programs, including the use of blended LEU fuel, and that these DOE programs distract from TVA's core mission of producing electricity for the region. Commentors expressed concern about the use of TVA's Sequoyah Nuclear Plant for both the MOX fuel and tritium production missions. The use of blended LEU fuel is almost identical to the use of commercial uranium fuel and, therefore, would not adversely affect the use of MOX fuel in TVA reactors. TVA's mission is to serve the Tennessee Valley through energy, environment, and economic development. TVA provides electricity for 9 million people in parts of seven southeastern states at prices below the national average. TVA, which receives no taxpayer money and makes no profits, also provides flood control, navigation, and land management for the Tennessee River system, and has been assisting utilities and state and local governments with economic development since 1933. Participation in various DOE programs (e.g., blended LEU reactor fuel and tritium production) enhances TVA's ability to continue providing electricity to its customers at prices below the national average. TVA remains committed to its core mission and expects that MOX fuel could help fulfill this mission, as a safe and cost-effective fuel to generate electricity.

The interagency agreement with NNSA for tritium production requires TVA to use up to three of its PWR units for tritium production. TVA decides how to use its PWR units to meet DOE's needs. To date, TVA

has been able to produce all tritium needed by NNSA in Watts Bar Unit 1. Steps are being taken to prepare Sequoyah Units 1 and 2 to be capable of tritium production if needed. Currently, TVA does not anticipate the need to perform tritium producing burnable absorber rod irradiation at Sequoyah for at least several years, if ever. TVA would not produce tritium and irradiate MOX fuel during the same fuel cycle.

Commentors expressed concern that there may be a higher radiation risk and higher incidence of cancer, leukemia, Lou Gehrig's disease, and other diseases near the Browns Ferry Nuclear Plant. As described in Chapter 3, Section 3.3.1.2, of the *SPD Supplemental EIS*, in 2008, Browns Ferry Nuclear Plant operations resulted in a dose to the maximally exposed individual of 0.043 millirem, well below regulatory limits, and well below the 318 millirem annual average dose potentially received by every person living in the area from natural background radiation. A study by the National Cancer Institute that included the Browns Ferry and Sequoyah Nuclear Plants did not detect excess mortality due to leukemia or other cancers in counties near domestic, commercial nuclear power plants (Seymour et al. 1991). In the report titled *Sources and Effects of Ionizing Radiation* (UNSCEAR 2010:373), United Nations researchers concluded that current scientific data are not sufficient to establish a causal relationship between ionizing radiation and cardiovascular disease at doses of less than about 100 to 200 rad (equivalent to about 100 to 200 rem for x-ray, gamma, and beta radiation), and that studies linking other fatal non-cancer diseases to radiation at doses of less than about 100 to 200 rad have yielded even less evidence of a causal relationship than that which exists for circulatory diseases.

Commentors were concerned that the public does not know the emergency evacuation procedures and what to do in case of an emergency at the reactor sites. TVA and local emergency responders are trained in emergency protocols for reactor emergencies. In the event of an emergency, information would be communicated to the public via emergency sirens, first responders, and radio and television broadcasts. Information on site specific emergency response for the Browns Ferry Nuclear Plant can be found at http://www.tva.com/power/nuclear/pdf/bfn_2012_emergencyinfo.pdf, and for the Sequoyah Nuclear Plant at http://www.tva.com/power/nuclear/pdf/sqn_2012_emergencyinfo.pdf.

MOX Fuel Use in Reactors – Tennessee Valley Authority Reactors

Commentors expressed concern about the use of MOX fuel in TVA reactors because of the condition of the Browns Ferry and Sequoyah Nuclear Plants, which are some of the oldest TVA nuclear plants. Concerns were also voiced about using MOX fuel in an ice condenser plant like Sequoyah, because of the susceptibility to containment failure in the event of a hydrogen explosion. Commentors expressed concern about numerous design, operational, and schedule changes that would be required to use MOX fuel in TVA reactors, including changes that would require relicensing. While DOE acknowledges that there are differences in the use of MOX fuel compared to uranium fuel, these differences are not expected to decrease the safety of the reactors. NRC has not considered it necessary to restrict operation of any of the reactors in the United States that use ice condenser containments. These factors are among those that would be considered by NRC to ensure that reactors, including those with ice condensers, would be able to continue to operate safely using MOX fuel. Before MOX fuel is used in any reactor in the United States, NRC would perform a comprehensive safety review of the use of MOX fuel in the proposed reactor(s) as part of the 10 CFR Part 50 or 52 licensing process.

Commentors expressed concern about the potential environmental, human health, and economic impacts associated with use of MOX fuel in TVA's reactors. The environmental, human health, and socioeconomic impacts of using MOX fuel in TVA's reactors are described in Appendix I, Section I.1, and summarized in Chapter 2, Section 2.6, of the *SPD Supplemental EIS*. The impacts of the use of a partial MOX fuel core are not expected to be substantially different from the impacts of normal reactor operation using a conventional full uranium fuel core.

Commentors expressed concern that the use of MOX fuel in reactors would make rivers and lakes around the power plants hotter than normal. As described in Chapter 5, Section 5.2, of the *SPD Supplemental EIS*, effluents, including thermal discharges from commercial nuclear power reactors, are regulated through the National Pollutant Discharge Elimination System or state permits. As described in Appendix I, Section I.1.2.7.3, MOX fuel use would not cause thermal discharges to exceed allowable levels.

Commentors requested that the* SPD Supplemental EIS *describe the impacts of used MOX fuel on used fuel management at a reactor. Commentors were concerned about how and where the used MOX fuel would be stored after removal from the reactor. Commentors stated that the* SPD Supplemental EIS *must include a review of TVA's ability to add used MOX fuel to storage pools, the length of time such fuel would be in the pools, the impact of used MOX fuel on overall storage pool management, issues involving the removal of used MOX fuel from pools, and its placement and storage in dry casks. As described in Appendix I, Section I.1, of the *SPD Supplemental EIS*, each LEU fuel and MOX fuel assembly would be discharged from the reactor with its own unique burn-up level and decay heat. The used fuel assemblies would be placed in the used fuel pool to reduce decay heat. When the decay heat reaches appropriate levels, the used fuel assemblies could be moved to dry storage casks. By the time used fuel assemblies are ready for dry storage, the decay heat for the LEU and MOX fuel assemblies would be similar. DOE anticipates that MOX fuel and LEU fuel assemblies would be managed similarly. Storage of used fuel at TVA's Browns Ferry and Sequoyah Nuclear Plants was analyzed in the NEPA documents prepared for these reactors (see Appendix A, Section A.3).

Commentors expressed concern that using MOX fuel in TVA reactors would not provide any benefits, such as additional jobs or cost savings, to ratepayers. Commentors expressed concern that private contractors would benefit from this project, as opposed to the ratepayers and taxpayers. Commentors wanted to know what the benefits to Morgan County and the state of Alabama would be. Others expressed concern that passing on lower electricity rates to the ratepayers would adversely affect the strides being made toward energy efficiency. Appendix I, Section I.1.2.3, of the *SPD Supplemental EIS* describes the socioeconomic impacts of using MOX fuel in the TVA reactors and the expectation that no jobs would be created in the regions around the TVA reactors as a result. Some labor would be required to perform studies and prepare reports to support the NRC license amendment process and to modify the reactors to use MOX fuel. This labor would likely be performed by a combination of DOE, TVA, and contractor personnel at locations across the United States.

TVA expects that the use of MOX fuel would be cost effective, but this is just one factor of many that must be considered in determining future electricity rates. TVA does not anticipate that any cost savings resulting from the use of MOX fuel would be great enough to adversely affect energy efficiency programs.

Commentors expressed concern about the impacts of decreased reactor reliability and greater outage time on TVA's energy portfolio and ratepayers, and that decreased reactor reliability would require greater reliance on coal with its environmental impacts. TVA does not anticipate decreased reliability or substantially greater outage periods from the use of MOX fuel in any of its reactors.

Commentors expressed concern about TVA's motive for going forward with MOX fuel use in its reactors and that TVA is being required to cooperate with the MOX program because it is owned by the U.S. Government. TVA is interested in supporting weapons nonproliferation and effective disposal while maintaining competitive fuel pricing for its fleet and electricity rates for its' customers. TVA is not required by the U.S. Government to use MOX fuel in its reactors. TVA would only use MOX fuel if it is safe and favorably priced relative to commercially available fuel. DOE and TVA have entered into an Interagency Agreement to evaluate the use of MOX fuel at TVA reactors, but have no contract for the use

of MOX fuel. Analyzing the environmental impacts and consequences of using MOX fuel in TVA reactors is included in the *SPD Supplemental EIS* and will assist TVA in its decisionmaking process. DOE continues to actively pursue other potential customers as well.

A commentor requested that DOE disclose the financial arrangement it would offer TVA or other utilities to use MOX fuel, including any subsidies offered. A price for the MOX fuel assemblies has not been determined, and the terms of an agreement to use MOX fuel have not been negotiated.

MOX Fuel Use in Reactors – Risk

Commentors expressed concern about an increase in the risk of an accident from reactors using MOX fuel, the potential to cause more cancers in the event of an accident, the proximity to populated areas, and that the plutonium in MOX fuel makes a reactor accident more dangerous to human health. Commentors expressed concern that the accidental release of plutonium to air or water could contaminate hundreds of square miles, causing cancer and leukemia and remaining in the environment indefinitely. Commentors were also concerned about the total cost of an accident that contaminates communities, homes, businesses, public schools, medical facilities, shopping centers, and farms. Appendix I of the *SPD Supplemental EIS* describes the potential impacts as well as the differences between a partial MOX fuel core and a full LEU fuel core, and summarizes the results of the more detailed accident analysis presented in Appendix J. While DOE acknowledges that there are differences in MOX fuel compared to uranium fuel, these differences are not expected to decrease reactor safety. The risks to the surrounding population for an accident with a partial MOX fuel core and with a full uranium fuel core are very similar and within the overall analysis uncertainty. The risks associated with design-basis accidents, at either the Browns Ferry or Sequoyah Nuclear Plant, are extremely low.

All relevant factors are being evaluated by TVA, in its due diligence, to ensure that its reactors could continue to operate safely if they were to use MOX fuel. Before MOX fuel is used in any reactor in the United States, NRC will perform a comprehensive safety review of the use of MOX fuel in the proposed reactor(s) as part of the 10 CFR Part 50 or 52 licensing process.

Commentors said that the* SPD Supplemental EIS *must analyze beyond-design-basis accidents, including accidents involving used fuel pools and a river tsunami accident as a result of upstream dam failure at the Sequoyah and Browns Ferry Nuclear Plants. Appendix I of the *SPD Supplemental EIS* describes the potential impacts, including differences associated with the two types of nuclear reactor cores, and summarizes the results of the more detailed accident analysis presented in Appendix J. Appendix J, Section J.3.3, includes an analysis of beyond-design-basis accidents for the TVA reactors. Used fuel pool accidents are not typically evaluated in detail in reactor accident analysis because other accidents have greater consequences. TVA has considered applicable natural phenomena, such as earthquakes, tornados, flooding, and dam failure, in safety analysis reports prepared for each reactor (TVA 2009, 2010). The *SPD Supplemental EIS* does not evaluate a dam failure "river tsunami accident" as this was not determined to be a credible design-basis accident in TVA's safety analysis reports. The beyond design-basis earthquake analyzed in the *SPD Supplemental EIS* would likely bound the impacts of any conceivable river tsunami accident.

Commentors expressed concern that the accident at the Fukushima Daiichi Nuclear Power Station in Japan should be considered because the design of the reactors is similar to the design of the reactors at the Browns Ferry Nuclear Plant. On March 11, 2011, an unprecedented Magnitude 9.0 earthquake and subsequent tsunami in Japan caused significant damage to reactors at the Fukushima Daiichi Nuclear Power Station. At the time of the accident, Unit 3 was operating using a partial MOX fuel core. Appendix J, Section J.3.3.3, of the *SPD Supplemental EIS* describes the NRC recommendations developed in

response to the accident at the Fukushima Daiichi Nuclear Power Station and subsequent actions that TVA has taken to further reduce the likelihood and severity of accidents at its nuclear plants. Additional information on NRC's response to the Fukushima accident can be found at http://www.nrc.gov/japan/japan-info.html.

A commentor stated that significant releases of actinides during reactor accidents would dominate the accident consequences. Appendix J, Section J.2.2, of the *SPD Supplemental EIS* describes the reactor core inventories for a partial MOX fuel core and a full LEU fuel core. The accident analyses show that isotopes of cesium and iodine generally provide the majority of the total dose from accidents; actinides generally provide only a small fraction of the total dose.

Commentors stated that the orders issued by NRC on March 12, 2012, pertaining to regulation of U.S. nuclear power reactors in the aftermath of the Fukushima accident are relevant, and these orders should be considered in the* SPD Supplemental EIS *regarding the Browns Ferry and Sequoyah Nuclear Plants and any other "generic" reactor that might test or use MOX fuel. All reactors are operating under licenses issued by NRC and in compliance with NRC regulations. The implementation of design and operational changes required by the NRC orders will only make the reactors safer to operate and enhance emergency response capabilities. Therefore, the reactor accident analyses presented in the *SPD Supplemental EIS* are conservative and would bound the impacts of accidents after any NRC-required changes are made.

Environmental Consequences

Commentors expressed concern about the environmental impacts of alternatives that are being considered, including air and water quality impacts; the effects of plutonium on humans, fish, macroinvertebrates, birds, insects, plants, and algae; worker safety; dose calculation methods; routine and accidental releases of radionuclides; consequences of potential accidents; synergistic effects of operating multiple facilities (i.e., cumulative impacts); and disposition of equipment after the surplus plutonium disposition activities are completed. Chapter 4 and supporting appendices of the *SPD Supplemental EIS* include analyses and discussions of these issues, including impacts on air quality, human health, socioeconomics, waste management, land resources, geology and soils, water resources, noise, ecological resources, cultural resources, and infrastructure. Section 4.5 contains an analysis of cumulative impacts, and Section 4.6 contains an analysis of the impacts of deactivation, decontamination, and decommissioning.

A commentor was concerned that plutonium oxide travels much faster than previously believed in groundwater. As described in Chapter 4, Section 4.1.7.3, of the *SPD Supplemental EIS*, DOE expects very small, if any, releases to surface or groundwater. Building confinement systems and high-efficiency particulate air filters limit any airborne releases of plutonium oxide to virtually undetectable levels. Any minute release of plutonium oxide to the atmosphere would be further reduced through the processes of dispersion, dilution, and then deposition, before soil or surface water could be affected. Lastly, to get to the groundwater, the material has to infiltrate through soil and rock layers to a groundwater aquifer, resulting in further dilution. Therefore, DOE expects there will be no impacts on groundwater resources.

A commentor was concerned that the human health effects analysis needs to recognize the fact that women, children, and fetuses are more sensitive to the effects of radiation than adult men. As described in Chapter 4, Section 4.1.2, of the *SPD Supplemental EIS,* consistent with DOE guidance, latent cancer fatalities are calculated by multiplying the total radiation dose in rem by a factor of 0.0006 latent cancer fatalities per person-rem of radiation dose. This factor accounts for exposure to sensitive subpopulations.

Commentors were concerned that the release of radioactive material changes global precipitation patterns. DOE is not aware of any evidence that radioactive materials in the atmosphere can affect global precipitation patterns.

Environmental Consequences – Savannah River Site

A commentor was concerned that a recent report found that over the past decade, radiation levels have increased and cancer-related deaths and health problems have exceeded the national average in the five-county area surrounding SRS. The commentor stated that, before proceeding with new facilities at SRS, DOE must ensure that future activities proposed in the* SPD Supplemental EIS *do not undermine the health and safety of local residents and workers. Chapter 3, Section 3.1.6.3, of the *SPD Supplemental EIS* summarizes the health effects studies performed for the region around SRS. As described in Section 3.1.6.3, there is little evidence of adverse impacts on offsite individuals. Table 3–14 presents cancer incidence rates for the United States, Georgia and South Carolina, and counties in Georgia and South Carolina. In addition, information on environmental monitoring is provided in the environmental surveillance reports for SRS at http://www.srs.gov/general/pubs/ERsum/index.html. As described in Chapter 4, Section 4.1.2.1, and summarized in Chapter 2, Table 2–3, no latent cancer fatalities are expected, and there would be little offsite impact on the public from normal operations of surplus plutonium disposition facilities. As described in Section 4.5.3.3, operation of surplus plutonium disposition facilities would contribute little to cumulative health effects among the offsite population.

A commentor was concerned that the likelihood of accidents would exponentially increase if MOX fuel were added to the already large inventory of radioactive materials at SRS. Appendix D of the *SPD Supplemental EIS* describes the accident scenarios and likelihood of each accident analyzed at SRS. These accidents are specific to the facility or process being performed and consider the presence of nearby facilities that may initiate an accident. It is highly unlikely that a radiological accident in one facility would cause a radiological accident in another facility at SRS.

Environmental Consequences – Los Alamos National Laboratory

Commentors stated that existing conditions at LANL must be taken into account. Some commentors were concerned that LANL has polluted the air and water with plutonium and cesium, that the public is drinking plutonium from LANL, and that such ingestion is causing cancer. Additionally, some commentors were concerned that LANL is located at the headwaters of New Mexico rivers and upwind from New Mexico's breadbasket. Chapter 3, Section 3.2, of the *SPD Supplemental EIS* describes the affected environment at and near LANL. Relevant accident history is described in Section 3.2.6.4; air quality in Section 3.2.4.2; water resources in Section 3.2.3; and health effects studies in Section 3.2.6.3. Additional information is provided in the annual environmental surveillance reports for LANL at http://www.lanl.gov/environment/all/esr.shtml. As described in the introduction to Chapter 4, impacts for each alternative are estimated by comparing facility characteristics and requirements from Chapter 2 and Appendix B with affected environment (existing conditions) information from Chapter 3. As described in Sections 4.1.2 and 4.1.7.3, DOE does not expect that pit disassembly and conversion at PF-4 at LANL will impact surface water or groundwater resources or cause any cancer fatalities in the public.

A commentor requested a full discussion in the analysis of the specific amounts and forms of plutonium, the purposes and capacities of the new facilities, the amounts of new waste and details regarding the waste streams, the history of surplus plutonium shipments to and from LANL, and the history of worker doses from both routine operations and accidents. Appendix B, Section B.2.1, of the *SPD Supplemental EIS* describes pit disassembly and conversion at PF-4 at LANL under the 2-metric-ton (2.2-ton) and expanded facility (35-metric-ton [38.6-ton]) options, including the amounts of materials

processed and the throughput rate. The environmental impacts are described in Appendix F, including waste management impacts. The human health risks from normal operations and accidents are described in Sections F.2.1 and F.2.2, respectively. Transportation of material to and from LANL is described in Appendix E. Chapter 4, Section 4.5.3.7, describes cumulative human health effects from transportation of radioactive materials. Chapter 3, Section 3.2.6.4, describes the relevant accident history at LANL, while Section 4.5.3.3.2 describes cumulative health effects among the worker population.

A commentor requested the* SPD Supplemental EIS *include an update of the seismic research at LANL. The commentor was also concerned that LANL does not meet industry standards for seismic hazards. The commentor stated that the scope of the* SPD Supplemental EIS *must include compliance with Executive Order 12699* (Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction) *with respect to PF-4. The commentor also stated that industry standards require documenting active buried faults in the vicinity of Technical Area 55, and new evidence has revealed that there may be an active buried fault below Technical Area 55, specifically at PF-4. Chapter 3, Section 3.2.2, of the *SPD Supplemental EIS* describes geology and soils conditions at PF-4 at LANL, including the location of faults and a discussion of seismic hazards. Appendix F includes analyses of the environmental impacts and human health risks of expanded pit disassembly and conversion processes in PF-4. Appendix D, Sections D.1.5.2.11 and D.2.9, provide more-detailed information on accidents at PF-4, including consideration of natural phenomena hazards, such as earthquakes. Section D.1.5.2.11 describes the completed and planned seismic upgrades to PF-4. The accident analyses in the *SPD Supplemental EIS* are conservatively based on the current state of PF-4 without future seismic upgrades.

Commentors were concerned about earthquake and wildfire risks at PF-4 at LANL, as well as risks related to processing larger amounts of plutonium, especially in the more dispersible oxide form. Commentors also were concerned about risks related to storage, staffing, worker dose, waste, transportation, and impacts on other programs. Commentors asked which types of pits would be processed in PF-4. Appendix F of the *SPD Supplemental EIS* includes analyses of the environmental impacts and human health risks of expanded pit disassembly and conversion in PF-4, including the effects of handling larger quantities of plutonium in metal and oxide form. Appendix D, Section D.1.5.2.11, provides more-detailed information on accidents at PF-4, including consideration of natural phenomena hazards such as earthquakes, volcanoes, and wildfires. Section D.1.5.2.11 describes the completed and planned seismic upgrades to PF-4. To be conservative, the accident analyses in the *SPD Supplemental EIS* consider the current state of PF-4 without future seismic upgrades.

Impacts on Existing Facility Operation and Closure/Cleanup

Commentors expressed concern that surplus plutonium disposition activities may interfere with cleanup and remediation activities and other projects at the DOE sites, and that the schedule for surplus plutonium disposition activities may impede completion of HLW vitrification in DWPF. The alternatives analyzed in the *SPD Supplemental EIS* take into account the availability of facilities and their closure schedules. Information relevant to these issues is presented in the description of the alternatives in Chapter 2, Section 2.3. DOE expects there would be minimal disruption of cleanup and remediation activities at DOE sites. The processing of surplus plutonium materials in DWPF would not affect the planned completion date for processing HLW through DWPF.

Transportation

Commentors expressed concern about the impacts from shipments of surplus plutonium, including the risks of accidents and leaks from shipping surplus plutonium to SRS, MOX fuel to the reactors, and

surplus plutonium to WIPP. A commentor asked DOE to describe how surplus plutonium is currently shipped from the Hanford Site in Washington, Lawrence Livermore National Laboratory in California, and LANL in New Mexico, and the impacts of these shipments. Requests were made to limit the transportation where possible and to ensure that the transportation was conducted as safely as possible. Concerns were also expressed that appropriately equipped emergency response teams should be on standby to respond to a transportation accident. Chapter 4, Section 4.1.5, of the *SPD Supplemental EIS* describes the human health risk from transportation under the surplus plutonium disposition alternatives evaluated, including the risks of accidents from shipping surplus plutonium to SRS and TRU waste to WIPP. The impacts of transportation of MOX fuel from SRS to the reactors is presented in Appendix I, Section I.1.2.5, for shipments to TVA's Browns Ferry and Sequoyah Nuclear Plants, and in Section I.2.2.5 for shipments to a generic reactor. Most of the shipments of surplus non-pit plutonium to SRS have already occurred, are covered by previous NEPA analyses, and, therefore, are not analyzed in the *SPD Supplemental EIS*. Additional details on the human health risks from transportation are provided in Appendix E. All shipments would be in compliance with applicable U.S. Department of Transportation, NRC, and DOE requirements. All shipments on public roads that transport plutonium pits or metal, or plutonium oxide powder would utilize NNSA's Secure Transportation Asset. Since the establishment of the DOE Transportation Safeguards Division in 1975, NNSA's Secure Transportation Assets have transported DOE-owned cargo more than 160 million kilometers (100 million miles) with no accidents that resulted in a fatality or release of radioactive material (NNSA 2010). Planning for emergency response for a potential accident that involves the release of nuclear materials is coordinated between DOE and state, local, and tribal officials. Prior to any shipment of hazardous material, a transportation plan is developed, which includes details of emergency preparedness, security, and coordination of DOE with local emergency response authorities. Any additional training or equipment needed is provided as part of the planning process. NNSA technical experts and emergency response personnel are prepared to respond immediately to any type of radiological accident or incident. NNSA's radiological emergency response assets include: Aerial Measuring System, National Atmospheric Release Advisory Capability, Accident Response Group, Federal Radiological Monitoring and Assessment Center, Nuclear Emergency Support Team, Radiological Assistance Program, and Radiation Emergency Assistance Center/Training Site.

Commentors expressed concern that transportation of plutonium oxide powder is much more dangerous than transportation of plutonium immobilized in glass. All shipments containing radioactive material under any of the alternatives analyzed in the SPD Draft SEIS would be in compliance with applicable U.S. Department of Transportation, NRC, and DOE requirements. As described in Appendix E of the *SPD Supplemental EIS,* shipments of MOX fuel to the TVA reactors and TRU waste to WIPP would not be in the form of plutonium oxide powder. The only offsite shipments of plutonium oxide powder would be made in NNSA's Secure Transportation Assets from LANL to SRS and the plutonium oxide would be sealed in DOE-STD-3013 cans inside a secondary containment vessel sealed in a Type B shipping container. This shipping configuration has been used in the plutonium consolidation program without incident and with no release of radioactive material. The shipping of plutonium immobilized in HLW glass is analyzed for the intersite transfer between facilities at SRS.As described in Appendix E, Section E.3.1, Type B containers are able to withstand forces likely to be experienced under accident conditions without loss of containment.

Commentors asked DOE to explain how MOX fuel would be shipped to the reactors, who would be responsible for the shipments, and what regulations would govern the shipments. Commentors expressed concern about changes to shipping regulations that could allow shipment of fresh MOX fuel in regular trucks rather than Safe Secure Trailers/Safeguard Transporters. Appendix E of the *SPD Supplemental EIS* describes how MOX fuel would be transported to the commercial reactor site. Fresh MOX fuel would be shipped in robust Type B packages using NNSA's Secure Transportation Assets. All

shipments would be in compliance with applicable U.S. Department of Transportation, NRC, and DOE requirements (see Chapter 5, Table 5–1).

Commentors requested advance notification of shipments. Another commentor asked that DOE consult with the State of South Carolina in a timely manner for any plutonium shipments anticipated involving the state, consistent with Public Law 107-107. Notification of pending shipments would be given to state and Federal authorities in accordance with existing laws, regulations and agreements. For security reasons, notice would not be given to the public.

Commentors expressed concern about the energy requirements, climate change impacts, and cumulative impacts of transportation of the surplus plutonium. The impacts of energy requirements are described in Chapter 4, Sections 4.1.7.7 and 4.7, of the *SPD Supplemental EIS*. The air quality impacts from fuel used for transportation under each alternative are evaluated in Section 4.1.1. Cumulative transportation impacts and climate change impacts, including consideration of fuel used for transportation, are described in Chapter 4, Section 4.5.

A commentor suggested an alternative transportation route to WIPP. DOE evaluates representative transportation routes for TRU waste to WIPP in the *SPD Supplemental EIS* and does not select specific shipping routes in the *SPD Supplemental EIS*; specific shipping routes would be determined at the time of shipment.

Environmental Justice

Commentors expressed concerns about environmental justice issues related to American Indian tribes near LANL. Commentors stated that increased exposure and alternative pathways for toxins need to be considered and factored into the environmental analysis. Chapter 3, Section 3.2.11, of the *SPD Supplemental EIS* describes minority and low-income populations near LANL. Chapter 4, Section 4.1.6, analyzes environmental justice impacts of the options for pit disassembly and conversion at LANL, including consideration of a tribal exposure or special pathways scenario and concludes that American Indians living near LANL are not exposed to elevated risks compared to nonminority populations living in the same area, and that the risks associated with the activities proposed at LANL are small. Under the tribal exposure scenario, the receptor drinks surface water and Indian tea, consumes contaminated foodstuffs, and consumes increased amounts of fish, deer, and elk from the areas surrounding LANL. Section 4.5.3.8 describes cumulative environmental justice impacts.

Commentors expressed concern about impacts on minority and low-income communities along the WIPP transportation route, including the impacts of trucks stopping at local stores where children and pregnant women shop. Chapter 4, Section 4.1.6, of the *SPD Supplemental EIS* discusses the potential environmental justice impacts of the alternatives. As described in Section 4.1.6, there would be no disproportionately high and adverse impacts on minority or low-income populations due to transportation under any of the alternatives.

Commentors requested that community meetings be held in each Pueblo and connecting river community within a 100-mile (161-kilometer) radius from LANL to honor the government-to-government consultation process. In support of its public outreach effort, DOE conducted three public scoping meetings in Carlsbad, Pojoaque (on the Pojoaque Reservation), and Santa Fe, New Mexico. In addition, DOE has met with American Indian groups and tribal governments to brief them on the scope of the *SPD Supplemental EIS*. In support of the SPD Supplemental EIS, DOE will continue to hold discussions with American Indian groups and tribal governments to brief them on the analysis in the SPD Supplemental EIS. Studies performed for the *LANL SWEIS* (DOE 2008:Volume 3, pages 2-17, 2-18)

show that the impacts of the operation of facilities at LANL drop off quickly with distance such that there is little or no effect at a distance of 50 miles (80 kilometers).

DOE is engaged in many activities related to environmental justice, including the Los Alamos–Pueblo Project where NNSA and DOE-EM jointly fund a program (about $2.1 million per year) that allows four tribal governments (Pueblos) to develop and maintain environmental monitoring programs specific to their respective communities and to provide technical input to NNSA decision making processes. These Pueblos are located adjacent to or near LANL. In another example, in response to Santa Clara Pueblo comments related to environmental justice that were submitted regarding the *LANL SWEIS*, NNSA provides funding to the Pueblo to prepare a proposal to conduct a Santa Clara-specific human health risk assessment. The action is being tracked as a NEPA requirement under the resulting *LANL SWEIS* Mitigation Action Plan.

***A commentor asked that DOE include American Indian tribal perspectives in the* SPD Supplemental EIS.** DOE has a significant tribal outreach program with the tribes surrounding LANL and routinely meets with interested tribal governments to discuss issues of mutual concern. DOE has decided not to include American Indian tribal perspectives in the *SPD Supplemental EIS*. Note: This request was not submitted by an American Indian tribe.

Emergency Response

Commentors requested specific details about monitoring and emergency plans. Some of the details requested, such as what radionuclides or other elements could be released from normal operations and DOE facility accidents, are included in the radiological analyses in Chapter 4, Section 4.1.2, and Appendices C and D of the *SPD Supplemental EIS*. Information about SRS, LANL, and TVA emergency response plans appears in Chapter 3, Sections 3.1.6.5, 3.2.6.5, 3.3.1.2, and 3.3.2.2. Additional information about monitoring may be found in other documents, such as the SRS, LANL, and WIPP annual environmental reports (accessible at http://www.srs.gov/general/pubs/ERsum/index.html, http://www.lanl.gov/environment/all/esr.shtml, and http://www.wipp.energy.gov/Documents_Environmental.htm, respectively), and environmental monitoring reports for the Browns Ferry and Sequoyah Nuclear Plants available through the NRC website (accessible at http://www.nrc.gov/reading-rm/adams.html).

A commentor was concerned about contingency plans for moving stored hazardous materials (including plutonium, biological laboratory materials, and weapons) if seismic or volcanic activity at LANL intensifies. Questions included: Have sites been prepared for emergency housing of dangerous LANL materials? What is the safest evacuation route for the materials? What are the safety thresholds of pits in those conditions? How much warning do seismic events and volcanic eruptions usually afford? Chapter 3, Section 3.2.2, of the *SPD Supplemental EIS* describes geology and soils conditions at PF-4 at LANL, including a discussion of seismic and volcanic hazards. Section 3.2.6.5 describes emergency preparedness at LANL. Appendix D, Section D.1.5.2.11, describes the accident scenarios analyzed at LANL. Section D.1.5.2.11 and the safety assessments prepared for facilities at LANL consider natural phenomena hazards such as earthquakes, volcanic eruptions, and wildfires. Facilities at LANL operate within their safety bases. The circumstances that would require the evacuation of hazardous, toxic, biohazard, and radioactive materials are not considered credible.

Security, Sabotage, and Terrorist Attack

Commentors were concerned about the risks of sabotage, theft, and terrorist attack on plutonium disposition facilities and transportation vehicles and the use of surplus plutonium in a dirty bomb.

The consequences of intentional destructive acts at DOE facilities are summarized in Chapter 4, Section 4.1.2.5, of the *SPD Supplemental EIS*; for TVA reactors, such consequences are described in Appendix I, Section I.1.2.2.3. A classified appendix for the *SPD Supplemental EIS* was prepared to examine the consequences of intentional destructive acts including potential acts of radiological sabotage and terrorism associated with the proposed action. Because of the sensitivity of information related to weapons-usable plutonium and the security of DOE and TVA nuclear facilities, this classified appendix is not available to the general public.

Commentors expressed concern about theft, sabotage, and terrorism during MOX fuel shipment and that MOX fuel use in TVA reactors makes them a more desirable target for terrorist attack. MOX fuel is not an attractive target for terrorist attack because it is not readily usable for a nuclear device or a dirty bomb. The plutonium in MOX fuel is blended with approximately 20 times as much depleted uranium as plutonium, and is formed into ceramic pellets encased in metal cladding. Moreover, the MOX fuel is contained in large and heavy fuel assembly structures that would make theft extremely challenging. A classified appendix for the *SPD Supplemental EIS* was prepared to examine the consequences of intentional destructive acts including potential acts of radiological sabotage and terrorism. Because of the sensitivity of information related to weapons-usable plutonium and the security of DOE and TVA nuclear facilities, this classified appendix is not available to the general public.

Commentors expressed concern about changes to NRC's regulations that would reduce security requirements for protection of fresh MOX fuel when in storage at domestic commercial nuclear power reactor sites. NRC regulations at 10 CFR 73.55 contain requirements for physical protection against radiological sabotage at commercial nuclear power reactors that would apply to reactors using MOX fuel. These requirements are based on evaluation of the hazards involved and the potential for theft, diversion, sabotage, or terrorist attack. NRC regulations and best management practices ensure that nuclear fuel storage would be done safely, whether involving MOX fuel or commercial uranium fuel.

Commentors expressed concern about United States- and foreign-owned contractors being responsible for management and security of the surplus plutonium. DOE complies with all applicable Federal regulations, and DOE orders, and performs required background investigations of corporations, both U.S. and foreign-owned, including those with Foreign Ownership, Control, or Influence (FOCI). FOCI investigations are performed to minimize the potential that work with foreign-owned companies could result in adverse consequences for DOE. In addition, as required by Federal regulations and DOE requirements, extensive pre-employment screening and background investigations are performed for personnel applying for positions involving the management and disposition of surplus plutonium.

U.S. Department of Energy

A commentor asked when DOE was founded and what its duties are. On August 4, 1977, President Carter signed the Department of Energy Organization Act, creating DOE from the Federal Energy Administration and the Energy Research and Development Administration. DOE's mission is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. NNSA was established by Congress in 2000 as a separately organized, semiautonomous agency within DOE, responsible for the management and security of the Nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. NNSA plays a critical role in ensuring the security of the Nation by maintaining the safety, security, and effectiveness of the U.S. nuclear weapons stockpile without nuclear testing; reducing the global danger from the proliferation of nuclear weapons and materials; providing the U.S. Navy with safe and effective nuclear propulsion; and providing the Nation with an effective nuclear counterterrorism and incident

response capability. More information about DOE and NNSA can be found at http://energy.gov/ and http://nnsa.energy.gov/, respectively.

Commentors suggested that, because of the secrecy of NNSA, the Surplus Plutonium Disposition Program would be better run by DOE-EM. Because aspects of the proposed Surplus Plutonium Disposition Program would utilize both NNSA and DOE-EM facilities, both organizations are involved in preparing the *SPD Supplemental EIS*. Certain aspects of the Surplus Plutonium Disposition Program deal with high-purity surplus plutonium from nuclear weapons and this material is the sole responsibility of NNSA, as directed by Congress through Public Law 106-65, which established this agency in 2000.

Commentors are concerned about the lack of progress in the Surplus Plutonium Disposition Program. Commentors stated that DOE needs to expedite the process and move ahead with the rapid disposition of surplus plutonium. DOE/NNSA has been working toward disposition of surplus plutonium for many years. As described in Appendix A, Section A.1, of the *SPD Supplemental EIS*, accomplishments to date include disposal of plutonium as TRU waste at WIPP; consolidation of surplus non-pit plutonium at SRS; and the ongoing construction of MFFF and the Waste Solidification Building, DOE plans to complete the *SPD Supplemental EIS* in early 2013 and issue a ROD soon thereafter. Surplus plutonium disposition activities are subject to the availability of funds appropriated by Congress.

A commentor was concerned that DOE has the sole power to decide what to do with taxpayer money. Other commentors were frustrated with DOE's wasteful spending in these times of budget shortfalls. The Office of Management and Budget provides oversight and guidance for the preparation of the Administration's budget requests, while Congress approves agency budgets, provides funding for all DOE programs, and provides oversight through various U.S. Senate and House of Representatives committees, as well as the Government Accountability Office. The Defense Nuclear Facilities Safety Board and the DOE Office of the Inspector General also provide oversight of DOE activities.

Nonproliferation

Commentors expressed concern that the proposed use of MOX fuel is inconsistent with U.S. nonproliferation policy. Another commentor suggested that DOE should prepare an updated nonproliferation assessment. The proposed use of MOX fuel is consistent with U.S. nonproliferation policy and international nonproliferation agreements. Use of MOX fuel would ensure that surplus plutonium is rendered into a used fuel form not readily usable for nuclear weapons. DOE has reviewed the existing assessment and believes that it is not necessary to prepare an updated nonproliferation assessment.

Commentors were concerned that the commercial use of MOX fuel establishes the building blocks for a plutonium-based economy, and that the blurring of the lines between the military and the commercial nuclear industry sets a dangerous precedent. The use of MOX fuel in domestic commercial nuclear power reactors would be undertaken in a manner that is consistent with the United States' policy objective on the irreversibility of the nuclear disarmament process and the United States' policy discouraging the civilian use of plutonium. The MOX fuel would be used in domestic commercial nuclear power reactors, with appropriate arrangements, including contractual or other provisions, limiting use of MOX fuel to surplus plutonium disposition.

Comments were received related to concerns about the reprocessing of plutonium. The U.S. surplus plutonium disposition program does not involve the reprocessing of used nuclear fuel.

A commentor asked about DOE's plan for additional surplus plutonium disposition as the Nation's nuclear weapons stockpile is retired. As described in Chapter 1, Section 1.5, the *SPD Supplemental EIS*

analyzes disposition alternatives for 13.1 metric tons (14.4 tons) of surplus plutonium, including a limited quantity (0.9 metric tons [1.0 tons] of additional non-pit plutonium, to allow for the possibility that DOE may, in the future, identify additional quantities of surplus plutonium that could be processed through the facilities and capabilities analyzed in the *SPD Supplemental EIS*. Other additional plutonium from future declarations related to nuclear weapons stockpile retirement would be subject to appropriate NEPA review before a disposition path could be selected.

United States–Russia MOX Fuel Program

Commentors expressed concern over Russian disposition activities and tying U.S. activities to Russian activities. A commentor asked DOE to describe the agreement between the United States and Russia that led to the MOX Fuel Program and provide an update on Russian surplus plutonium disposition. Questions included: When will Russia begin producing MOX fuel? How much money has the United States given to Russia for its MOX Fuel Program? The *Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated As No Longer Required for Defense Purposes and Related Cooperation* (referred to as the "PMDA") was first signed in 2000, with two protocols in 2006 and 2010, and entered into force in 2011. The United States remains committed to the PMDA between the United States and the Russian Federation, under which both countries have agreed to each dispose of at least 34 metric tons (37.5 tons) of excess weapons-grade plutonium in nuclear reactors to produce electricity. It is important that MFFF begin operations to demonstrate progress to the Russian government, meet U.S. legislative requirements, and reduce the quantity of surplus plutonium and the concomitant cost of secure storage. More information on the PMDA is located on the NNSA website at: http://www.nnsa.energy.gov/mediaroom/factsheets/rpd, and the U.S. State Department website at http://www.state.gov/r/pa/prs/ps/2010/04/140097.htm.

Out of Scope

A number of other issues that were raised by commentors are not within the scope of the *SPD Supplemental EIS*. These are:

- Funding the complete cleanup of SRS
- The number of contractors with foreign roots involved in surplus plutonium disposition activities
- How the fate of waste vitrified at Hanford affects the proposed immobilization activities
- Establishing a disposition path for the research reactor fuel in storage at SRS by processing through H-Canyon
- The impacts of AREVA's operations in Europe
- TVA's interest in building new nuclear power plants and a reprocessing plant
- TVA's involvement in energy conservation and renewable energy, including solar power
- Tritium contamination at the Watts Bar Nuclear Plant
- The presence of radioactive chemicals in the Rio Grande and the drinking water in Albuquerque, New Mexico, and the potential role of LANL, Sandia National Laboratories, and Kirtland Air Force Base in causing this contamination
- Issues related to war, nuclear weapons and a nuclear-free world

- General concerns about the nuclear power industry
- Support for other energy sources, such as biodiesel, solar, wind, and geothermal
- Concerns about emissions from coal-fired power plants
- Concerns about fluoride in toothpaste and water
- An invention that would use heat generated by plutonium-239 to produce electricity
- Cost of the disposition alternatives
- Plutonium recycling and plutonium production
- Increase in the incidence of diabetes due to radioactive contamination
- Burn rates at the Russian BN-800 fast breeder reactor
- Mining sites that are contaminated and unsafe
- Compensation for local communities for extending plutonium storage at SRS
- Conduct of public meetings on the *Final Supplemental Environmental Impact Statement for the Nuclear Facility Portion of the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory* (DOE 2011b)
- DOE's response to Freedom of Information Act requests

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