

[6450-01-P]

DEPARTMENT OF ENERGY

Surplus Plutonium Disposition

AGENCY: National Nuclear Security Administration, U.S. Department of Energy.

ACTION: Record of Decision.

SUMMARY: On May 8, 2015, the U.S. Environmental Protection Agency (EPA) issued a *Federal Register* notice (80 FR 26559) announcing the availability of the Department of Energy/National Nuclear Security Administration's (DOE/NNSA's) *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (Final SPD Supplemental EIS) (DOE/EIS-0283-S2, April 2015). Among the proposed actions considered in the Final SPD Supplemental EIS, DOE/NNSA analyzed the potential environmental impacts of alternatives for the disposition of 13.1 metric tons (MT) (14.4 tons) of surplus plutonium for which a disposition path is not assigned, including 7.1 MT (7.8 tons) of surplus pit plutonium and 6 MT (6.6 tons) of surplus non-pit plutonium. At the time the Final SPD Supplemental EIS was issued, DOE/NNSA did not have a Preferred Alternative for any of the proposed actions considered in the Final SPD Supplemental EIS. Subsequently, on December 24, 2015, DOE/NNSA issued a *Federal Register* notice (80 FR 80348) identifying the Preferred Alternative for disposition of the 6 MT of surplus non-pit plutonium analyzed in the Final SPD Supplemental EIS. In its

Federal Register notice, DOE/NNSA announced that its Preferred Alternative is to prepare 6 MT of surplus non-pit plutonium for disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, a geologic repository for disposal of transuranic (TRU) waste generated by atomic energy defense activities.

DOE/NNSA is announcing a decision to implement its Preferred Alternative for the disposition of 6 MT of surplus non-pit plutonium, as described in DOE/NNSA's *Preferred Alternative for Certain Quantities of Plutonium Evaluated in the Final Surplus Plutonium Disposition Supplemental EIS*. Shipments of this surplus non-pit plutonium to WIPP, after it is operational,¹ will be placed in the queue of waste to be shipped to WIPP. This plutonium will be prepared and packaged to meet the WIPP waste acceptance criteria for contact-handled TRU waste and other applicable regulatory requirements.

The scope of DOE/NNSA's current decision pertains only to the 6 MT of surplus non-pit plutonium that is a subset of the 13.1 MT of surplus plutonium considered in the Final SPD Supplemental EIS. DOE/NNSA does not have a preferred alternative and is not making any decisions, at the present time, for other alternatives considered in the Final SPD Supplemental EIS. These other alternatives include alternatives for the disposition of 7.1 MT of surplus pit plutonium for which a disposition path is not assigned and various options for providing the capability to disassemble surplus pits and convert the plutonium from pits into a form suitable for disposition.

¹ DOE suspended disposal activities at WIPP in February 2014 following a salt truck fire and unrelated radiological event underground. Waste emplacement operations at WIPP are expected to commence in late 2016.

Additionally, DOE/NNSA reaffirms its commitment 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 Needed for Defense Purposes* (Plutonium Management and Disposition Agreement or PMDA), which calls for the United States and the Russian Federation to each dispose of at least 34 MT (37.5 tons) of weapon-grade plutonium withdrawn from nuclear weapon programs. DOE/NNSA's previous decisions related to surplus plutonium disposition, including copies of the applicable *Federal Register* notices, may be found in Appendix A of the Final SPD Supplemental EIS.

FOR FURTHER INFORMATION CONTACT: For further information on the surplus plutonium disposition program, please contact Ms. Sachiko W. McAlhany, National Environmental Policy Act (NEPA) Document Manager, U.S. Department of Energy at spdsupplementaleis@leidos.com.

For information on DOE's NEPA process, please contact Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance, U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585-0103; Telephone: (202) 586-4600, or leave a message at (800) 472-2756.

This Record of Decision, the Final SPD Supplemental EIS, and related NEPA documents are available at <http://nnsa.energy.gov/nepa/spdsupplementaleis> and <http://energy.gov/nepa/nepa-documents>.

SUPPLEMENTARY INFORMATION:

Background

DOE/NNSA's purpose and need for action remains as stated in the 1999 *SPD EIS* (DOE/EIS-0283, November 1999) to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner, ensuring that it can never again be readily used in nuclear weapons.

Based on a series of NEPA reviews beginning with the *SPD EIS* and described in Appendix A, Section A.1, of the Final SPD Supplemental EIS, DOE/NNSA has determined disposition paths for most of the current U.S. inventory of surplus, weapons-usable plutonium; however, 13.1 MT of surplus weapons-usable plutonium (7.1 MT of pit plutonium and 6 MT of non-pit plutonium) did not have an assigned disposition path. DOE/NNSA prepared the SPD Supplemental EIS to evaluate alternatives for disposition of this 13.1 MT of surplus plutonium.

Alternatives Considered

In the Final SPD Supplemental EIS, DOE/NNSA analyzed the potential environmental impacts for the No Action Alternative and four action alternatives for disposition of 13.1 MT of surplus plutonium that do not have a disposition path assigned, of which the 6 MT of non-pit plutonium is a subset. These four alternatives are: 1) immobilization at SRS (Immobilization to Defense Waste Processing Facility [DWPF] Alternative); 2)

fabrication into mixed oxide (MOX) fuel at SRS with subsequent irradiation in one or more domestic commercial nuclear power reactors (MOX Fuel Alternative); 3) vitrification with high-level radioactive waste (HLW) at SRS (H-Canyon/HB-Line and DWPF Alternative); and, 4) potential disposal as contact-handled transuranic (CH-TRU) waste at WIPP (WIPP Disposal Alternative). These alternatives are composed of a combination of pit disassembly and conversion options and plutonium disposition options. The plutonium disposition options that are applicable to the 6 MT of surplus non-pit plutonium are described in Section S.9.2 of the Final SPD Supplemental EIS (DOE/EIS-0283-S2, April 2015). For the Final SPD Supplemental EIS, the scope of analysis for the WIPP Disposal Alternative was increased, in response to public comment, to include the full 13.1 MT of surplus plutonium for which a disposition path is not assigned. In the Draft SPD Supplemental EIS, the scope of analysis for the WIPP Disposal Alternative was limited to 6 MT of surplus non-pit plutonium (described in Section S.8.2.4 of DOE/EIS-0283-S2, July 2012). The disposition decision announced today addresses 6 MT of surplus, weapons-usable, non-pit plutonium, not the entire 13.1 MT of surplus plutonium analyzed in the Final SPD Supplemental EIS.

Within each action alternative, DOE/NNSA evaluated options to disassemble nuclear weapons pits and convert the plutonium metal to an oxide form for disposition. DOE/NNSA has not identified a Preferred Alternative for the disposition of the remaining 7.1 MT of surplus plutonium (surplus pit plutonium) for which a disposition path has not been assigned, or for any option(s) for providing the capability to disassemble surplus pits and convert the plutonium from pits to a form suitable for

disposition. Once DOE/NNSA identifies a Preferred Alternative for the remaining 7.1 MT of surplus pit plutonium and/or the disassembly and conversion options, DOE/NNSA will announce its preference in a *Federal Register* notice and publish a Record of Decision no sooner than 30 days after its announcement of a Preferred Alternative.

Preferred Alternative

As announced on December 24, 2015, in a *Federal Register* notice (80 FR 80348), DOE/NNSA's Preferred Alternative with regard to the 6 MT of surplus non-pit plutonium is to prepare this plutonium for disposal at WIPP near Carlsbad, New Mexico, a geologic repository for disposal of TRU waste generated by atomic energy defense activities. This would allow DOE/NNSA to continue progress on the disposition of surplus weapons-usable plutonium in furtherance of the policies of the United States to ensure that surplus plutonium is never again readily used in a nuclear weapon, and to remove surplus plutonium from the Savannah River Site (SRS) in the State of South Carolina. Surplus non-pit plutonium would be prepared and packaged at SRS using H-Canyon/HB-Line and/or K-Area facilities to meet the WIPP waste acceptance criteria and all other applicable regulatory requirements. Shipments of this surplus plutonium to WIPP, after it is operational, will be placed in the queue of waste to be shipped to WIPP.

Environmentally Preferable Alternative

After considering the potential impacts on each resource area, DOE/NNSA identified the No Action Alternative as the environmentally preferable alternative in the near-term, for the 6 MT of surplus non-pit plutonium evaluated in the Final SPD Supplemental EIS and

that is the subject of this Record of Decision. Under the No Action Alternative, the 6 MT of surplus non-pit plutonium would be stored at the K-Area Complex at SRS, consistent with the 2002 *Amended Record of Decision: Surplus Plutonium Disposition Program* (67 FR 19432); the *Supplement Analysis, Storage of Surplus Plutonium Materials at the Savannah River Site* (DOE/EIS-0229-SA-4) and an amended Record of Decision issued in 2007 (72 FR 51807). No new facilities would be constructed and no processing for disposal or off-site transportation of this material would take place with the exception of a small amount of plutonium required for the material surveillance program.

Surveillance activities would be performed on the plutonium and plutonium packages, including destructive and non-destructive examinations, to ensure safe storage (DOE/EA-1538, *Revised Finding of No Significant Impact for Safeguards and Security Upgrades for Storage of Materials at the Savannah River Site* dated December 2005, and Interim Action Determinations approved in December 2008, September 2009, and March 2011). Although the No Action Alternative is the environmentally preferable alternative, this alternative would not result in the disposition of the 6 MT of surplus non-pit plutonium.

Potential Environmental Impacts of Preferred Alternative

For each alternative, the SPD Supplemental EIS analyzed the potential impacts on air quality, human health, socioeconomics, waste management, transportation, environmental justice, land resources, geology and soils, water resources, noise, ecological resources, cultural resources, and infrastructure. DOE/NNSA also evaluated the potential impacts of the irreversible and irretrievable commitment of resources, the short-term uses of the environment, and the maintenance and enhancement of long-term

productivity. These analyses and results for the entire 13.1 MT of surplus plutonium are described in the Summary and Chapter 4 of the Final SPD Supplemental EIS. Table S-3 of the Final SPD Supplemental EIS Summary provides a summary of potential environmental impacts associated with each alternative as well as a means for comparing the potential impacts among alternatives.

In the Draft SPD Supplemental EIS, the scope of analysis for the WIPP Disposal Alternative was limited to 6 MT of surplus non-pit plutonium (described in Section S.8.2.4 of DOE/EIS-0283-S2, July 2012). The analyses and results for the disposition of 6 MT can be found in the Summary, Chapter 4, and Appendix G “Impacts of Plutonium Disposition Options” of the Draft SPD Supplemental EIS.

In identifying its Preferred Alternative for disposition of 6 MT of surplus non-pit plutonium and making the decision announced in this Record of Decision, DOE/NNSA considered the potential environmental impacts that would result from operations conducted at SRS to prepare and package this quantity (6 MT) of material for disposition at WIPP, those related to transporting the material from SRS to WIPP, and disposal at WIPP. Implementing the WIPP Disposal Alternative relies on existing facilities, structures and pads at SRS to prepare the surplus non-pit plutonium for disposal. This would reduce the potential for additional land disturbance, and reduce the need for additional deactivation and decommissioning in the future. Some staging of packages at E-Area at SRS prior to shipping may be required. This would result in negligible incremental impacts on both workers and the public. The pace of environmental

restoration activities at SRS, as well as the requirements for environmental monitoring and protection at SRS and WIPP, would generally remain unchanged from current levels.

The potential impacts from transporting surplus plutonium to WIPP are also addressed in the Final SPD Supplemental EIS. The Final SPD Supplemental EIS indicated that under all alternatives (including the WIPP Disposal Alternative) no latent cancer fatalities are expected in the general public along the transportation routes and in the transportation crews due to incident-free transport of radioactive wastes and materials from SRS. The potential environmental impacts of TRU waste disposal at WIPP are evaluated in the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* (WIPP SEIS-II) (DOE/EIS-0026-S-2, September 1997) and subsequent Supplement Analyses from 2005 (DOE/EIS-0026-SA-05) and 2009 (DOE/EIS-0026-SA-07) and are briefly described in Appendix A, Section A.2, of the Final SPD Supplemental EIS.

Public Involvement

Since the announcement of the first notice of intent to prepare the SPD Supplemental EIS in 2007 (72 FR 14543), DOE/NNSA has provided three scoping periods during which DOE/NNSA held public scoping meetings and actively solicited scoping comments from Federal agencies, state and local governmental entities, American Indian tribal governments, and members of the public. 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. Meetings were held in Aiken, Columbia, and

North Augusta, South Carolina; Tanner, Alabama; Chattanooga, Tennessee; and Carlsbad, Santa Fe, Espanola, and Pojoaque, New Mexico.

On July 27, 2012, EPA and DOE/NNSA published notices in the *Federal Register* announcing the availability of the Draft SPD Supplemental EIS (77 FR 44234 and 77 FR 44222, respectively). A 60-day comment period was provided from July 27 to September 25, 2012. In response to public requests, DOE/NNSA extended the public comment period by 15 days through October 10, 2012. During the public comment period, DOE/NNSA held seven public hearings to provide interested members of the public with opportunities to learn more about the content of the Draft SPD Supplemental EIS, to hear DOE/NNSA representatives present the results of the Draft SPD Supplemental EIS analyses, to ask questions; and to provide oral and/or written comments. The hearings were held in Los Alamos, Santa Fe, Carlsbad, and Espanola, New Mexico; North Augusta, South Carolina; Chattanooga, Tennessee; and Tanner, Alabama.

DOE/NNSA received 432 comment documents containing approximately 1,050 comments during the comment period for the Draft SPD Supplemental EIS. DOE/NNSA responded to these comments in the Comment Response Document, Volume 3, of the Final SPD Supplemental EIS.

Comments on the Final SPD Supplemental EIS and Preferred Alternative

DOE/NNSA distributed the Final SPD Supplemental EIS to Congressional members and committees; State and local governments; other Federal agencies, culturally affiliated

American Indian tribal governments, non-governmental organizations, and other stakeholders including members of the public who requested the document. Also, the Final SPD Supplemental EIS was made available via the Internet.

On December 24, 2015, DOE/NNSA announced its Preferred Alternative in the *Preferred Alternative for Certain Quantities of Plutonium Evaluated in the Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (80 FR 80348) with regard to the 6 MT of non-pit plutonium. DOE/NNSA considered all comments received on the Final SPD Supplemental EIS and the Preferred Alternative and concluded that those comments do not identify a need for further NEPA analysis. The Appendix to this Record of Decision summarizes DOE/NNSA's consideration of these comments.

Decision

DOE/NNSA has decided to implement its Preferred Alternative as described in DOE/NNSA's *Preferred Alternative for Certain Quantities of Plutonium Evaluated in the Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (80 FR 80348) with regard to the disposition of 6 MT of surplus, weapons-usable, non-pit plutonium; DOE/NNSA's Preferred Alternative is to prepare that plutonium for disposal at WIPP near Carlsbad, New Mexico, a geologic repository for disposal of TRU waste generated by atomic energy defense activities. All practicable means to avoid or minimize environmental harm for the decision identified have been adopted.

Under this alternative, the non-pit plutonium will be prepared for disposal in facilities at HB-Line or K-Area at SRS for disposal at WIPP. The non-pit plutonium containers will

be opened in an existing glovebox or newly- constructed glovebox capability in HB-Line or K-Area. Plutonium metal will be converted to oxide. Plutonium oxide will be repackaged into suitable containers, mixed/blended with inert material and loaded into pipe overpack containers (POCs) or criticality control overpacks (CCOs). (DOE/NNSA plans to move toward the use of the CCO containers in lieu of the POC to maximize the amount of plutonium that can be packaged in each container, thereby reducing the number of shipments and volume emplaced at WIPP.) The inert material will be added to inhibit plutonium recovery. Loaded POCs or CCOs will be characterized for WIPP disposal in E-Area at SRS including non-destructive assay, digital radiography, and headspace gas sampling. Waste packages containing surplus plutonium that have been successfully characterized and meet the WIPP waste acceptance criteria will be placed in the queue of waste to be shipped to WIPP after WIPP is operational. The packages will be shipped to WIPP in TRUPACT-II or HalfPACT shipping containers

Unirradiated Fast Flux Test Facility (FFTF) reactor fuel is included in this 6 MT of non-pit plutonium. If the FFTF fuel cannot be disposed of by direct disposal at WIPP, it will be disassembled at SRS and packaged for disposal at WIPP. H-Canyon at SRS will be used to disassemble the fuel bundles, remove the pellets from the fuel pins, and package the pellets into suitable containers. HB-Line or K-Area will be used to prepare and mix/blend the fuel pellet material with inert material, then package it for shipment to WIPP.

Disposition decisions announced in this Record of Decision address only the 6 MT of surplus non-pit plutonium. DOE/NNSA has no Preferred Alternative at this time for the disposition of the remaining 7.1 MT of surplus plutonium from pits for which a disposition pathway has not been assigned, or for the capability to disassemble surplus pits and convert the plutonium from pits to a form suitable for disposition. Once a Preferred Alternative is identified, DOE/NNSA will announce its preference in a *Federal Register* notice and publish a Record of Decision no sooner than 30 days after its announcement of a Preferred Alternative.

Basis for Decision

In making its decision, DOE/NNSA considered potential environmental impacts of construction and operations, current and future mission needs, technical and security considerations, availability of resources, and public comments on the Draft and Final SPD Supplemental EIS, and the notice of Preferred Alternative. Implementing the WIPP Disposal Alternative for disposition of 6 MT of surplus non-pit plutonium allows DOE/NNSA to take advantage of existing facilities, infrastructure and expertise at SRS and WIPP. The decision builds on the existing capabilities, infrastructure, and skilled workforce trained in safe operation of nuclear facilities. Environmental impacts and costs (DOE (U.S. Department of Energy) *Report of the Plutonium Disposition Working Group: Analysis of Surplus Weapon-Grade Plutonium Disposition Options*, Washington, D.C., April 2014) would be less than some of the other alternatives that would require the construction of new facilities. In addition, DOE/NNSA will make use of existing facilities, resulting in efficient use of the facilities. Blending for disposal at WIPP is a

proven process that is ongoing at SRS for disposition of plutonium material from the DOE-STD-3013 surveillance process and other non-pit plutonium. In addition, disposal of this surplus non-pit plutonium will avoid long-term impacts, risks, and costs associated with storage.

DOE/NNSA also considered acceptability of the surplus non-pit plutonium at WIPP and WIPP's performance in making this decision. DOE has previously disposed of similar surplus plutonium at WIPP from SRS, the Rocky Flats Environmental Technology Site, and the Hanford Site (the Rocky Flats and Hanford materials were packaged and shipped directly from those sites). As was the case for previous SRS activities requiring the processing of surplus plutonium for disposal at WIPP, the surplus plutonium identified in this decision will be packaged to meet the WIPP waste acceptance criteria and all applicable regulatory requirements. Compliance with the WIPP waste acceptance criteria is one factor that will help ensure that any TRU waste emplaced in WIPP will not exceed the 40 CFR Part 191 performance standards and will meet other applicable requirements. Additionally, the WIPP TRU waste inventory – which includes radionuclide activity -- is revised annually and reviewed by DOE for compliance. DOE's currently projected WIPP TRU waste inventory with the addition of the 6 MT of surplus non-pit plutonium suggests that WIPP would continue to comply with 40 CFR 191. These projections from the TRU Waste Inventory and other information are submitted every five years to the EPA, as part of the Compliance Recertification Application, under 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations*. Following issuance of this

ROD, the 6 MT of surplus non-pit plutonium will be reflected in the TRU Waste Inventory and inform the next compliance re-certification application to be submitted to EPA in 2019.

Implementing the Preferred Alternative will allow the DOE/NNSA to continue its progress on the disposition of surplus weapon-usable plutonium in furtherance of the policies of the United States to ensure that surplus plutonium is never again readily used in a nuclear weapon, and to remove surplus plutonium from the State of South Carolina.

Mitigation Measures

SRS facility operations would result in airborne emissions of various pollutants, including radionuclides, and organic and inorganic constituents. These emissions would continue to be controlled using Best Available Control Technology to ensure that emissions are compliant with applicable standards. Impacts would be controlled by use of glovebox confinement, packaging as applicable, building confinement and air filtration systems to remove radioactive particulates before discharging process exhaust air to the atmosphere, and internal scrubbers to reduce chemical gas concentrations. Occupational safety risks to workers would be limited by adherence to Federal and state laws; Occupational Safety and Health Administration regulations; DOE/NNSA requirements including regulations and orders; and plans and procedures for performing work.

DOE/NNSA facility operations adhere to programs to ensure the reduction of human health and safety impacts. Workers are protected from specific hazards by use of engineering and administrative controls, use of personal protective equipment, and

monitoring and training. The Radiological Protection Program limits impacts by ensuring that radiological exposures and doses to all personnel are maintained As Low As Reasonably Achievable (ALARA) and by providing job specific instructions to the facility workers regarding the use of personal protective equipment. The Emergency Preparedness Program mitigates potential accident consequences by ensuring that appropriate organizations are available to respond to emergency situations and take appropriate actions to recover from accident events, while reducing the spread of contamination and protecting facility personnel and the public.

Issued at Washington, DC on March 29, 2016.

Frank G. Klotz
Administrator, National Nuclear Security Administration

Appendix: Public Comments Received on the *Final SPD Supplemental EIS* and the *Preferred Alternative for Certain Quantities of Plutonium Evaluated in the Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement*

DOE/NNSA received eight letters and emails regarding the *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (Final SPD Supplemental EIS) (DOE/EIS-0283-S2, April 2015) (80 FR 26559) and *Preferred Alternative for Certain Quantities of Plutonium Evaluated in the Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (80 FR 80348). DOE/NNSA considered all comments contained in the letters and emails. Some of the comments included issues already raised during the comment period for the *Draft Surplus Plutonium Disposition Supplemental Environmental Impact Statement*. All prior comments submitted on the Draft SPD Supplemental EIS and DOE/NNSA responses to those comments have been published in the Final SPD Supplemental EIS, Volume 3, *Comment Response Document*, and are not being revisited.

In announcing its Preferred Alternative for the disposition of 6 MT of surplus non-pit plutonium, DOE/NNSA stated that it had no Preferred Alternative for other potential actions considered in the Final SPD Supplemental EIS. Specifically, DOE/NNSA stated that it had no Preferred Alternative for the disposition of the remaining 7.1 MT of surplus plutonium from pits and that it did not have a Preferred Alternative among the pathways analyzed for providing the capability to disassemble surplus pits and convert the plutonium from pits to a form suitable for disposition. Further, some of the comments were beyond the scope of the Final SPD Supplemental EIS. DOE/NNSA did not address such comments.

DOE/NNSA received comments on the Final SPD Supplemental EIS and the notice of Preferred Alternative from The Governing Body of the City of Carlsbad, New Mexico; Shelly Wilson, Permitting and Federal Facilities Liaison of the South Carolina Department of Health and Environmental Control; Rick McLeod, Executive Director of the Savannah River Site Community Reuse Organization; Tom Clements of Savannah River Site Watch; Edwin Lyman and Frank von Hippel of the Union of Concerned Scientists; Andrew Kadak; Michael High; and Don Hancock of Southwest Research and Information Center. The topics below summarize the concerns expressed within those comments and provides DOE/NNSA's responses.

Topic A – National Environmental Policy Act Compliance: Commentors were concerned that analyses of the potential environmental impacts of processing, packaging, and disposal of surplus non-pit plutonium, which could include some quantity of “gap” plutonium retrieved from foreign countries, had not been performed as required by the National Environmental Policy Act (NEPA) and new or supplemental EISs should be prepared. A commentor also stated that in March 2015, President Obama authorized DOE to pursue a defense high level radioactive waste (HLW) repository; therefore, it is a reasonable alternative for defense surplus plutonium that must be considered, but is not included in the Storage and Disposition PEIS, nor the Draft or Final SPD Supplemental EIS.

Discussion: DOE believes sufficient information exists, including NEPA documentation, to support a Record of Decision for the disposition of 6 MT of surplus non-pit plutonium for which a disposition path was not assigned. DOE has completed appropriate tiered NEPA analyses related to the Surplus Plutonium Disposition program including the

Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement (Storage and Disposition PEIS) (DOE/EIS-0229) in 1996, *Surplus Plutonium Disposition Environmental Impact Statement* (SPD EIS) (DOE-EIS-0283) in 1999, and *Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (SPD Supplemental EIS) (DOE/EIS-0283-S2) in 2015.

DOE/NNSA's need to store and disposition surplus plutonium, in accordance with U.S. nonproliferation and export control policies in a safe, reliable, cost effective and timely manner, has not changed since the Storage and Disposition PEIS was prepared in 1996. DOE/NNSA did, however, become aware of new circumstances and information relevant to the 1999 SPD EIS that did warrant re-examination of some of the analyses provided in that NEPA document.

Consequently, the SPD Supplemental EIS was prepared in accordance with applicable Council on Environmental Quality and DOE NEPA regulations to examine the potential environmental impacts of reasonable alternatives for the disposition of 13.1 MT of surplus plutonium for which a disposition path was not assigned, including 6 MT of surplus non-pit plutonium. The SPD Supplemental EIS also analyzed options to provide the appropriate capability to disassemble surplus pits and convert surplus plutonium to a form suitable for disposition. In preparing the Final SPD Supplemental EIS, DOE/NNSA considered the analyses in the related NEPA documents identified above. The Final SPD Supplemental EIS addresses all of the relevant issues and analysis related to the proposed action and updates the analyses where necessary.

Appropriate NEPA analyses exist for processing 6 MT of surplus non-pit plutonium at SRS and transportation and disposal of the resulting CH-TRU waste at WIPP, near Carlsbad, New Mexico, a geologic repository for disposal of TRU waste generated by atomic energy defense activities. Chapter 4 and Appendix G of the SPD Supplemental EIS, describe the potential environmental impacts of plutonium disposition options, including preparing surplus non-pit plutonium at facilities at SRS for disposal at WIPP. Appendix E of the SPD Supplemental EIS, describes the potential environmental impacts of transportation of surplus plutonium for disposal at WIPP. Section 4.5.3.6.3, of the *Final SPD Supplemental EIS* describes the capacity and ability of WIPP to accept 13.1 MT of surplus plutonium as analyzed under the WIPP Disposal Alternative in the Final SPD Supplemental EIS. The potential environmental impacts of TRU waste disposal at WIPP are evaluated in the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (WIPP SEIS-II)* (DOE/EIS-0026-S2, September 1997) and subsequent Supplement Analyses from 2005 (DOE/EIS-0026-SA-05) and 2009 (DOE/EIS-0026-SA-07). Also, see *Topic B – WIPP Capacity*, and *Topic C – WIPP Acceptance*, for further discussion of these topics.

Certain plutonium recovered from foreign sources may have originated from atomic energy defense activities. Up to 0.9 MT of such plutonium may be included in the 6 MT of surplus non-pit plutonium discussed in Chapter 1, Section 1.5.2 of the Final SPD Supplemental EIS in the event that the plutonium from foreign sources is received at SRS. Thus, the potential environmental impacts from the processing and disposition of surplus plutonium recovered from foreign countries, also referred to as “gap material plutonium”, through NNSA’s Global Threat Reduction Initiative are evaluated in the

SPD Supplemental EIS. NEPA analysis for the transportation, receipt, and processing of gap material plutonium in preparation for disposition is provided in DOE/NNSA's *Environmental Assessment for the U.S. Receipt and Storage of Gap Material Plutonium* (DOE/EA-1771) May 2010² and DOE/NNSA's *Environmental Assessment for Gap Material Plutonium – Transport, Receipt, and Processing* (Gap Material Plutonium EA) (DOE/EA-2024), December 2015. DOE determined that the potential environmental impacts of implementing the proposed action are not significant, and in May 2010 and December 2015, issued Findings of No Significant Impact.

In President Obama's March 24, 2015, "*Presidential Memorandum -- Disposal of Defense High-Level Radioactive Waste in a Separate Repository*" to the Secretary of Energy, President Obama found, in accordance with Section 8 of the Nuclear Waste Policy Act of 1982, that "the development of a repository for the disposal of high-level radioactive waste resulting from atomic energy defense activities only is required." DOE is now authorized to move forward with planning for a separate repository for HLW resulting from atomic energy defense activities. At present, no site has been identified or proposed and no funds have been appropriated for designing, constructing and operating such a repository.

Topic B – The Blending Process and Implementing the Preferred Alternative at

SRS: Commentors expressed concern that many hurdles would remain affecting DOE/NNSA's ability to carry out this decision once the ROD is issued. Commentors also expressed the view that no additional surplus plutonium should be received at SRS

² While this EA is for Official Use Only, the Finding of No Significant Impact can be viewed on the DOE NEPA Website (<http://energy.gov/nepa/downloads/ea-1771-finding-no-significant-impact>).

until surplus plutonium currently in storage at SRS is removed from the State of South Carolina. Commentors requested information about facilities and infrastructure for blending and packaging the 6 MT of surplus non-pit plutonium at SRS, a description of the processes to be used in blending and packaging and the schedule for processing and shipping to WIPP.

Discussion: As described in this Record of Decision, DOE/NNSA has decided to prepare 6 MT of surplus non-pit plutonium for disposal at WIPP. This would allow the DOE/NNSA to continue progress on the disposition of surplus weapon-usable plutonium in furtherance of the policies of the United States to ensure that surplus plutonium is never again readily used in a nuclear weapon, and to remove surplus plutonium from the State of South Carolina.

This Record of Decision summarizes how DOE/NNSA intends to prepare the 6 MT of surplus non-pit plutonium for disposition at WIPP. For additional information, Chapter 2, Section 2.2.4, and Appendix B, Section B.1.3, of the Final SPD Supplemental EIS describe how plutonium would be blended with inert materials and packaged at SRS. Blending these types of materials for disposal at WIPP is a proven process that is ongoing at SRS for disposition of plutonium material from the DOE-STD-3013 surveillance process and other non-pit plutonium. Implementing the WIPP Disposal Alternative for this surplus non-pit plutonium relies on existing SRS facilities (with additional glovebox capability in an existing facility), structures, and pads to prepare the material for disposal. Surplus non-pit plutonium would be prepared and packaged at SRS using H-Canyon/HB-line and/or K-Area Complex facilities and would be temporarily stored in E-Area at SRS until shipped to WIPP. DOE/NNSA's assumptions associated with the schedule for

equipping and operating facilities at SRS are described in Table B-2 in the *Final SPD Supplemental EIS*.

This Record of Decision identifies DOE/NNSA's intent to place the 6 MT of non-pit plutonium in POCs or CCOs for disposition following its conversion to plutonium oxide and blending with inert materials. (DOE/NNSA plans to move toward the use of the CCO containers in lieu of the POC to maximize the amount of plutonium that can be packaged in each container, thereby reducing the number of shipments and volume emplaced at WIPP.) For additional information, see Chapter 2, Section 2.2.4, and Appendix B, Section B.3, of the *SPD Supplemental EIS* which describe the POC and CCO containers that would be used for disposal of surplus plutonium at WIPP.

The details of the inert materials with which plutonium would be blended and applicable safeguards for the plutonium are classified or official use only. The termination of safeguards process is part of DOE/NNSA's Material Control and Accountability Program and is outside the scope of the Final SPD Supplemental EIS and this Record of Decision. A schedule for shipment of the 6 MT of plutonium to WIPP has not been established (limited waste emplacement at operations at WIPP are expected to commence in late 2016). Shipments of this surplus non-pit plutonium to WIPP, after it is operational, will be placed in the queue of waste to be shipped to WIPP.

Topic C - WIPP Capacity: Commentors were concerned that the WIPP unsubscribed capacity had been incorrectly calculated and that the available volume is less than the volume described in the SPD Supplemental EIS; thus, the disposition of 6 MT of surplus non-pit plutonium could not be accomplished within the unsubscribed capacity of WIPP.

Discussion: The WIPP Land Withdrawal Act establishes a total WIPP capacity for TRU waste disposal of 175,600 cubic meters (6.2 million cubic feet). Chapter 4, Section 4.5.3.6.3, of the Final SPD Supplemental EIS describes the capacity and ability of WIPP to accept 13.1 MT of surplus plutonium as analyzed under the WIPP Disposal Alternative. This analysis considered past and projected disposal amounts at WIPP of TRU waste from across the DOE complex and as a result of these considerations, an unsubscribed disposal capacity of 24,700 cubic meters (872,000 cubic feet) of CH-TRU waste was assumed for purposes of analysis in the Final SPD Supplemental EIS.

The estimate of unsubscribed disposal capacity in the Final SPD Supplemental EIS was made using DOE's Annual Transuranic Waste Inventory Report for 2012. The TRU waste volumes reported in the Annual Transuranic Waste Inventory Reports are based on final (containerized) TRU waste forms. Projections from the Annual Transuranic Waste Inventory Reports for 2014 and 2015, suggests that although TRU waste disposal projections vary somewhat from year to year, the information in these documents would not change the conclusions reached in the Final SPD Supplemental EIS.

All of the TRU waste projected from the activities addressed in the Final SPD Supplemental EIS is expected to be CH-TRU waste. As indicated in Chapter 4, Section 4.5.3.6.3 of the *Draft SPD Supplemental EIS*, disposal of 6 MT of surplus non-pit plutonium at is estimated to result in 15,000 to 17,000 cubic meters of CH-TRU waste, using pipe overpack containers (POCs) for packaging the 6 MT of surplus non-pit plutonium. These estimated volumes can be substantially reduced if criticality control overpacks (CCOs) are used for packaging the surplus plutonium for WIPP disposal rather than the assumed POCs and the unirradiated Fast Flux Test Facility (FFTF) fuel is

disposed of by direct disposal at WIPP. (If the FFTF fuel cannot be disposed of by direct disposal at WIPP, it will be disassembled at SRS and packaged for disposal at WIPP.)

The WIPP underground is composed of disposal rooms or “panels” mined from the salt beds. Disposal panels at WIPP can be enlarged and /or additional panels can be created to accommodate the 175,600 cubic meters (6.2 million cubic feet) of TRU waste allowed under the WIPP Land Withdrawal Act. Future waste disposal at WIPP could involve new disposal panels that could be larger (with more capacity per panel) or more numerous than the 10 panels that were included in the nominal conceptual design of the WIPP underground that one of the commentors references.

Topic D - WIPP Acceptance: Commentors requested information on the process and procedures for acceptance of drums containing surplus plutonium at WIPP. In addition, commentors were concerned that disposal of 6 MT of surplus non-pit plutonium at WIPP exceeds previously evaluated amounts of plutonium increasing criticality risk, and that it exceeds plutonium amounts included in previous Compliance Certification Applications to the U. S. Environmental Protection Agency (EPA).

Discussion: The process and procedures for acceptance of surplus plutonium blended with inert materials are the same as the process and procedures for acceptance of any CH-TRU waste at WIPP as described in *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (DOE/WIPP-02-3122). As required by DOE Order 420.1, *Facility Safety*, criticality was considered in the *Waste Isolation Pilot Plant Documented Safety Analysis* (DOE/WIPP 07-3372, November 2013) and determined to be an “incredible event” at WIPP.

DOE has previously disposed of similar surplus plutonium at WIPP from SRS, the Rocky Flats Environmental Technology Site, and the Hanford Site; the Rocky Flats and Hanford materials were packaged and shipped directly from those sites (*Los Alamos National Laboratory Carlsbad Operations Performance Assessment Inventory Report 2012*, INV-PA-12, Revision 0). As was the case for previous SRS activities requiring the processing of surplus plutonium for disposal at WIPP, the surplus plutonium identified in this decision will be packaged to meet the WIPP waste acceptance criteria and all applicable regulatory requirements.

As described above, there are statutory limits on the total volume of TRU waste that may be disposed of at WIPP. There are also statutory limits on the total curies of remote-handled TRU waste, but there are no statutory limits on the total curies of CH-TRU waste, such as the 6 MT of surplus non-pit plutonium. The regulations at 40 CFR Part 191, Subparts B and C, *Environmental Standards for Disposal and Environmental Standards for Ground-Water Protection*, applicable to WIPP, provide release limits to the accessible environment and the regulations in Subpart B require reasonable expectation that the individual protection (dose) standard will be met for 10,000 years after disposal, based on a performance assessment and other applicable information, which takes into account the potential release of radionuclides to the accessible environment from the TRU Waste Inventory emplaced and projected to be emplaced in WIPP. The TRU waste inventory – which includes radionuclide activity -- is revised annually and reviewed by DOE for compliance. DOE's projections of its TRU waste inventory with the addition of the 6 MT of surplus non-pit plutonium suggest that WIPP would continue to comply with applicable 40 CFR Part 191 requirements. These projections from the

TRU Waste Inventory Report and other information are submitted every five years to EPA, as part of the Compliance Recertification Application, under 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations*. Following issuance of this Record of Decision, the 6 MT of surplus non-pit plutonium will be reflected in the TRU Waste Inventory Report and inform the next re-certification application to be submitted to EPA in 2019.

The WIPP waste acceptance criteria help ensure, with an appropriate margin, that any TRU waste emplaced in WIPP will not exceed the 40 CFR Part 191 performance standards and will meet other applicable requirements. The 6 MT of surplus non-pit plutonium will be packaged to meet the WIPP waste acceptance criteria, thereby providing further assurance that the additional inventory will not challenge the 40 CFR Part 191 repository performance standards.

During the disposal phase of WIPP repository operations, criticality is controlled by the packaging requirements imposed by the waste acceptance criteria. As required by DOE Order 420.1, *Facility Safety*, criticality was considered in the *Waste Isolation Pilot Plant Documented Safety Analysis* (DOE/WIPP 07-3372) and determined to be an “incredible event” at WIPP. Furthermore, in 2000, Sandia National Laboratories was commissioned to conduct a conservative analysis of the possibility of a criticality event over the required 10,000-year performance period for WIPP. In *Consideration of Nuclear Criticality When Disposing of Transuranic Waste at the Waste Isolation Pilot Plant* (SAN 099-2898), Sandia National Laboratories concluded that criticality is not a credible event. The analysis evaluated conditions within the WIPP repository itself including the possibility

of a criticality event in adjacent geologic media into which fissile material could be assumed to migrate.

Topic E - Consideration of the February 2014 Incidents and Restart of Operations

at WIPP: Commentors were concerned that the WIPP operational history and the February 2014 incidents were not considered in developing the Final SPD Supplemental EIS and this Record of Decision.

Discussion: The "Foreword" of the Final SPD Supplemental EIS includes information on the February 2014 incidents at WIPP. DOE has considered WIPP's performance in making this decision to send 6 MT of surplus plutonium to WIPP for disposal. A schedule for shipment of the 6 MT of surplus non-pit plutonium to WIPP has not been established. Shipments of this surplus non-pit plutonium to WIPP, after it is operational, will be placed in the queue of waste to be shipped to WIPP. DOE anticipates resuming limited waste disposal operations at WIPP in 2016 when it is safe to do so. Significant improvements are being implemented to enhance the safety environment at WIPP including enhancements to fire suppression and unground ventilation and improvements in underground stability. DOE provides regular updates and detailed information on the status of recovery activities at WIPP on the WIPP website (<http://www.wipp.energy.gov/wipprecovery/recovery.html>). These safety changes and improvements are being implemented regardless of the decision to dispose of 6 MT of surplus plutonium at WIPP.

Topic F - Cost: Commentors were concerned about the cost of the surplus plutonium disposition alternatives and that adequate funding be provided such that DOE can move forward with disposition of the 6 MT of surplus non-pit plutonium at WIPP.

Discussion: As described in this Record of Decision, DOE/NNSA has decided to prepare 6 MT of surplus non-pit plutonium for disposal at WIPP. This would allow the DOE/NNSA to continue progress on the disposition of surplus weapon-usable plutonium in furtherance of the policies of the United States to ensure that surplus plutonium is never again readily used in a nuclear weapon, and to remove surplus plutonium from the State of South Carolina. Scheduling and implementation of surplus plutonium disposition activities are subject to the availability of funds as appropriated by Congress.

With respect to cost considerations, implementing the WIPP Disposal Alternative for the disposition of 6 MT of surplus non-pit plutonium would rely on existing facilities (with additional glovebox capability in an existing facility), structures, and pads, and when compared to the other alternatives evaluated in the *SPD Supplemental EIS*, would reduce the potential need for constructing and equipping additional facilities, and consequently reduce the need for future facility deactivation and decommissioning at SRS. Blending with inert materials for disposal at WIPP is a proven process that is ongoing at SRS for disposition of plutonium material from the DOE-STD-3013 surveillance process and other non-pit plutonium.