Amended Interim Action Determination

Disposition of Certain Plutonium Materials at the K-Area Complex, Savannah River Site

In October 2011, the Manager of the Savannah River Operations Office approved an Interim Action Determination, *Disposition of Certain Plutonium Materials Stored at the Savannah River Site*. This Amended Interim Action Determination amends the 2011 Interim Action Determination by adding a second Savannah River Site (SRS) facility to prepare surplus plutonium for disposal at the Waste Isolation Pilot Plant (WIPP). The Department of Energy (DOE) would use the K-Area Complex (KAC) in addition to the HB-Line to prepare approximately 500 kilograms (kg) of plutonium for disposal at WIPP. The 2011 Interim Action Determination is attached to this Amended Interim Action Determination.

In order to reduce storage requirements and reduce the risk inherent in storing nuclear materials, DOE has a need to continue the task of preparing and shipping surplus, non-pit plutonium oxide from SRS to WIPP for safe and secure disposal. Except for some potential 3013 Surveillance Program plutonium, these materials present difficulties for fabrication into the Mixed Oxide Fuel Fabrication Facility (MFFF) feed or processing through H-Canyon, and cannot be vitrified at this time because the capability to do so does not exist. DOE evaluated the environmental impacts of disposition of plutonium as transuranic (TRU) waste in the SRS Waste Management (WM) Environmental Impact Statement [EIS] (DOE/EIS-0217, July 1995). In 2003, DOE amended the Record of Decision for the Interim Management of Nuclear Materials EIS (DOE/EIS-0220, October 1995) to add the alternative of disposal of plutonium materials as TRU waste.

DOE regulations for implementing the National Environmental Policy Act (NEPA), Title 10 Code of Federal Regulations (CFR) Parts 1021.104 and 1021.211 describe requirements for allowable interim action concerning a proposal which is the subject of an ongoing EIS. No action concerning such a proposal may be taken if the action would: (1) have an adverse environmental impact, or (2) limit the choice of reasonable alternatives.

Preparation of Plutonium at K-Area for Disposal at WIPP

DOE would dispose of approximately 500 kg of surplus plutonium materials via blending to waste at the HB-Line and the KAC, SRS, for disposal at WIPP. Preparation in the KAC would be the same as described for the HB-Line in the 2011 Interim Action Determination. Preparation and disposal of this same quantity of material may be achieved more quickly by utilizing the K-Area 3013 Surveillance Program glovebox and associated equipment over the next several years. As described in the October 2011 Interim Action Determination, candidate WIPP plutonium contains contaminants from previous processing and handling, causing the plutonium to exceed MFFF specifications. In addition, due to operational issues such as the lack of adequate quantities of depleted uranium to downblend the fissile material, and the current fissile material limit for vitrified high-level waste, processing in the HB-Line/H-Canyon for disposal in Defense Waste Processing Facility (DWPF) canisters is not a viable option. The process steps and duration would be the same whether performed in the HB-Line or the KAC as described in the 2011 Interim Action Determination.

Environmental Impacts

The approximate 880 cubic meters of TRU waste generated from the surplus plutonium blending is a fraction of the TRU waste generated historically at SRS and dispositioned to WIPP. The potential impacts of disposition would not exceed those described for TRU waste treatment and storage in Table 2-17 of the SRS WM EIS (DOE/EIS-0217, July 1995). In the Interim Management of Nuclear Materials (IMNM) EIS (DOE/EIS-0220, October 1995), DOE evaluated the environmental impacts of alternatives for stabilizing a variety of plutonium materials. In 2003, DOE amended the Record of Decision for the IMNM EIS to add the alternative of disposal of plutonium materials, without further processing, as TRU waste, based on analysis found in the SRS WM EIS. DOE estimated that about 10 cubic meters would be disposed as a result of that action, compared to 130 cubic meters of TRU waste DOE estimated could result from processing rather than disposing of the material. Similarly, the 500 kg of surplus plutonium could be dispositioned without further processing.

WIPP has been safely disposing of TRU waste for more than 10 years, and the 880 cubic meters that would result from this action represents a small fraction, about 3 percent, of the unsubscribed WIPP disposal capacity. Based on the analysis described above and the operational history of WIPP, preparation and disposal of the 500 kg of surplus plutonium from this action would not result in adverse environmental impacts.

Choice of Reasonable Alternatives

In the Surplus Plutonium Disposition (SPD) Supplemental Environmental Impact Statement (SEIS), DOE is evaluating several alternatives for the disposition of surplus plutonium, including preparing as feedstock for MFFF, processing in the HB-Line/H-Canyon for vitrification in DWPF, vitrification to glass into cans which would ultimately be placed in DWPF waste canisters (can-in-can), and blending to TRU waste for shipment to WIPP. As described in the 2011 Interim Action Determination, technical issues preclude disposition of the 500 kg of surplus plutonium by each of these methods, except disposal at WIPP. For these reasons, disposing of this 500 kg of plutonium materials as TRU waste does not limit the choice of reasonable alternatives for disposition of the remaining surplus, non-pit plutonium addressed in the SPD SEIS.

Conclusion

DOE has reviewed the environmental analysis relevant to preparation for disposition in the HB-Line and K-Area at SRS, and disposal at WIPP, approximately 500 kg of surplus, non-pit plutonium. DOE finds that the analysis in the IMNM EIS and SRS WM EIS are still representative of the impacts of disposal of these materials. Therefore, no adverse environmental impacts would result from disposal of this material as TRU waste to WIPP. Because of the small fraction of material involved relative to the 6 metric tons of plutonium materials being evaluated in the SPD SEIS, and because this material does not lend itself to disposition using the other alternatives,

disposal of this material as TRU waste would not affect DOE's ultimate selection of disposition alternatives. Use of capabilities in the KAC, in addition to the HB-Line, changes neither environmental impacts nor the choice of reasonable alternatives. Therefore, this action is clearly an allowable interim action in accordance with DOE regulations for implementing NEPA at Title 10 CFR Parts 1021.104 and 1021.211.

Approved at the Savannah River Site, Aiken, South Carolina:

David C. Moody

10/30/13

David C. Moody, Manager
Savannah River Operations Office

Date

Interim Action Determination

Disposition of Certain Plutonium Materials Stored at the Savannah River Site

The Department of Energy (DOE) is preparing the Surplus Plutonium Disposition (SPD) Supplemental Environmental Impact Statement (SEIS) (DOE/EIS-0283-S2). DOE is evaluating alternatives for disposition of plutonium that is surplus to the national security needs of the United States for which DOE has not made a disposition decision. The Department continues to evaluate alternative disposition paths for surplus plutonium materials and options for supplying plutonium oxide feed material for the Mixed Oxide Fuel Fabrication Facility (MFFF). The alternative disposition paths DOE is evaluating are preparation as MFFF feed, disposing through HB-Line/H-Canyon and the Defense Waste Processing Facility (DWPF) at the Savannah River Site (SRS), can-in-canister disposal with small cans of plutonium oxide vitrified in borosilicate glass placed in DWPF canisters, and preparation for disposal at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. The surplus plutonium being addressed in the SPD SEIS includes both pit and non-pit (up to approximately 6 metric tons) material; however, the WIPP disposal alternative applies only to the non-pit material. DOE issued an Amended Notice of Intent for the SPD SEIS on July 19, 2010 (75 Federal Register [FR] 41850. As a result of a study of alternatives for supplying oxide for the MFFF authorized by the Deputy Secretary of Energy in May 2011, DOE may again revise the Notice of Intent for the SPD SEIS. While the schedule for issuing the SPD SEIS is very uncertain, DOE anticipates that the earliest possible completion date would the summer of 2012.

In order to reduce storage requirements and reduce the risk inherent in storing nuclear materials, DOE has a need to begin preparing and shipping approximately 500 kilograms (kg) of non-pit plutonium materials to WIPP. These materials are not suitable for fabrication into MFFF feed material, cannot be processed through H-Canyon, and cannot be vitrified at this time because the capability to do so does not exist. DOE evaluated the environmental impacts of disposition of plutonium as transuranic waste in DOE/EIS-0217, SRS Waste Management (WM) EIS. In 2003 DOE amended the Record of Decision for the Interim Management of Nuclear Materials EIS (DOE/EIS-0220, October 1995) to dispose of plutonium materials as TRU waste.

DOE regulations for implementing the National Environmental Policy Act (NEPA) at Title 10 Code of Federal Regulations (CFR) Parts 1021.104 and 1021.211 describe requirements for allowable interim action concerning a proposal that is the subject of an ongoing project-specific EIS. No action concerning such a proposal may be taken if the action would: (1) have an adverse environmental impact, or (2) limit the choice of reasonable alternatives being evaluated in the ongoing EIS.

Preparation of Plutonium for Disposal at WIPP

DOE proposes to dispose of approximately 500 kg of surplus plutonium materials. These materials include impure fuel grade plutonium and plutonium mixed with various enrichment levels of uranium. Due to contaminants from previous processing and handling, these materials do not meet the specifications for feed for the MFFF. In

addition, operational issues, including the unavailability of adequate quantities of depleted uranium to downblend the fissile material and the current fissile material limit for vitrified high-level waste, processing in H-Canyon and HB-Line at the SRS in preparation for disposal in DWPF canisters is not a viable option for disposition of these materials.

DOE-STD-3013 containers stored in the K-Area Material Storage Area would be transferred to HB-Line. Inside glove boxes in HB-Line, the cans would be opened and the plutonium divided into less than 175 gram quantities, mixing the plutonium with Termination of Safeguards Materials, packaging the mixture in cans, and placing the cans in pipe overpack containers. The pipe overpack containers would be sent to H-Canyon and staged for shipment to E-Area at SRS where they would be certified for shipment to WIPP. Certified packages would be loaded into TRU waste package transporter (TRUPACT-II) shipping containers and transported by truck to WIPP for disposal. Preparing and packaging the up to 500 kg of plutonium materials would result in about 880 cubic meters of TRU waste and require approximately 120 shipments to WIPP. DOE estimates that this action would take place over a period of approximately three years.

Environmental Impacts

Generation of approximately 880 cubic meters of TRU waste for disposal at WIPP would represent a small fraction of the SRS TRU waste generated, stored, and dispositioned to date. The potential impacts of disposition would not exceed those described for TRU waste treatment and storage in Table 2-17 of the Savannah River Site Waste Management (SRS WM) EIS (DOE/EIS-0217, July 1995). In the Interim Management of Nuclear Materials (IMNM) EIS (DOE/EIS-0220, October 1995), DOE evaluated the environmental impacts of alternatives for stabilizing a variety of plutonium materials. In 2003 DOE amended the Record of Decision for the IMNM EIS to dispose of some plutonium materials, without further processing, as TRU waste, based on the analysis found in the SRS WM EIS. DOE estimated that about 10 cubic meters would be disposed as a result of that action, compared to 130 cubic meters of TRU waste DOE estimated could result from processing rather than disposing of the material. Similarly the 500 kg of plutonium could be disposed of without further processing.

WIPP has been safely disposing of TRU waste for more than 10 years, and the 880 cubic meters that would result from this action represents a small fraction, about 3 percent, of the unsubscribed WIPP disposal capacity. Based on the analysis described above and the operational history of WIPP, preparation and disposal of the 500 kg of plutonium from this action would not result in adverse environmental impacts.

Choice of Reasonable Alternatives

In the SPD SEIS, DOE is evaluating various alternatives, including alternatives for disposition of up to 6 metric tons of surplus non-pit plutonium. Alternatives for this material include processing in HB-Line/H-Canyon for vitrification in DWPF, preparing the plutonium for use as feedstock for the Mixed Fuel Fabrication Facility (MFFF), vitrification

in a glass can-in-canister waste form for disposal in DWPF waste canisters, and packaging for shipment to WIPP and disposal as TRU waste. In the SPD SEIS, DOE will evaluate the disposal of up to 6 metric tons of non-pit plutonium using these alternatives; DOE may choose to dispose of some fraction of the 6 metric tons using each alternative. The plutonium material addressed by this interim action is plutonium and uranium (including depleted, natural, and enriched uranium) mixtures and fuel-grade plutonium with greater than 9 weight-percent plutonium 240, and therefore exceeds the isotopic specifications for feed material for the MFFF. SRS does not have the capability to purify it. This material could not be disposed of using the MFFF alternative and disposing of it as TRU waste does not limit the choice of reasonable alternatives. Similarly, because of the fissile material limit in high level waste the plutonium would have to be fed to the next 4 sludge batches for vitrification in DWPF, which would extend the operation of DWPF though about 2017. DOE does not have an operational dissolver capable of dissolving this plutonium oxide material at this time. In addition, disposition using the processing in H-Canyon for vitrification in DWPF alternative would result in production of an additional 28 DWPF canisters. For these reasons disposing of this 500 kg of plutonium material as TRU waste does not limit the choice of reasonable alternatives for disposition of the remaining non-pit plutonium addressed in the SPD SEIS. In regard to the glass can-in-canister alternative, DOE has no capability to implement this alternative at this time.

Conclusion

DOE has reviewed the environmental analysis relevant to preparing for disposition and disposing at WIPP 500 kg of surplus, non-pit plutonium. DOE finds that the analyses in the IMNM EIS and the SRS WM EIS are still representative of the impacts of disposing of these materials. Therefore, no adverse environmental impacts would result from disposal of this material as TRU waste at WIPP. Because of the small quantity involved relative to the 6 metric tons of plutonium materials being evaluated in the SPD SEIS, and because this material does not lend itself to disposition using the other alternatives, disposal of this material as TRU waste would not affect DOE's ultimate selection of disposition alternatives. Therefore this action is clearly an allowable interim action in accordance with DOE regulations for implementing NEPA, at 10 CFR 1021.104 and 1021.211.

Approved at the Savannah River Site, Aiken, South Carolina, October 17, 2011

David C. Moody

Dr. David C. Moody, Manager
Savannah River Operations Office