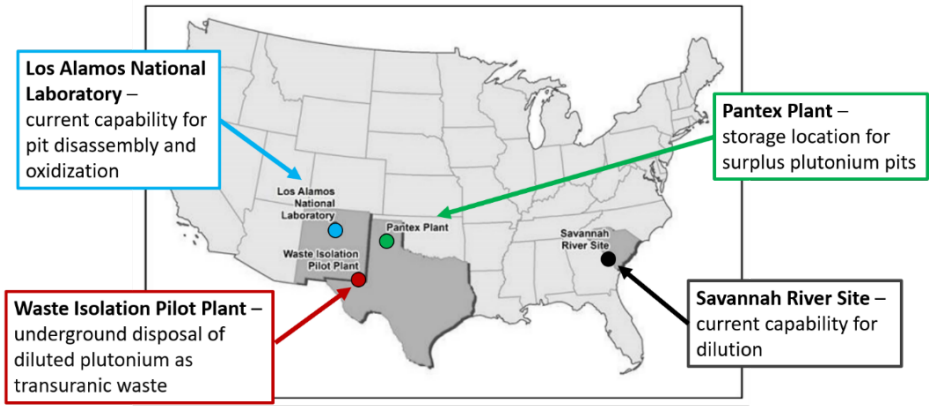
National Nuclear Security Administration, U.S. Department of Energy
Surplus Plutonium Disposition Program
Environmental Impact Statement

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States (U.S.) Department of Energy (DOE) is preparing an environmental impact statement (EIS) for the Surplus Plutonium Disposition Program (SPDP) consistent with requirements of the National Environmental Policy Act of 1969 (NEPA). Announcements and information related to this EIS are available online at https://www.energy.gov/nnsa/nnsa-nepa-reading-room.

Purpose and Need for the Proposed Action. NNSA, consistent with the U.S. international obligations, proposes to reduce the threat of nuclear weapons proliferation worldwide by dispositioning 34 metric tons (MT) of excess plutonium in the United States in a safe and secure manner, ensuring that it can never again be readily used in nuclear weapons. The proposed activities necessary to disposition the surplus plutonium would occur at multiple sites across the Nation including the Savannah River Site (SRS) in South Carolina, Los Alamos National Laboratory (LANL), the Waste Isolation Pilot Plant (WIPP) in New Mexico, and the Pantex Plant (Pantex) in Texas.

NNSA needs to implement a disposition process and strategy that can be safely executed in a reasonable time frame at a cost consistent with fiscal realities. To maximize efficiency, NNSA proposes to implement proven technology that is based on processes requiring minimal research and development.



Key Decisions Regarding Surplus Plutonium Disposition. Over the last two and a half decades, DOE has studied many alternative technologies and locations for surplus plutonium disposition. The 34 MT of material, comprised of pit and non-pit plutonium, was intended to be dispositioned by fabricating the oxidized plutonium into mixed oxide (MOX) fuel for irradiation in domestic commercial nuclear power reactors to produce electricity. This alternative was d iscussed in the 1999 *Surplus Plutonium Disposition*

Environmental Impact Statement (DOE/EIS-0283). However, MOX is no longer a viable alternative as the MOX project was canceled in 2018 and the former MOX Fuel Fabrication Facility (MFFF) is being repurposed for another NNSA mission.

In 2016, DOE decided to dispose of a separate 6 MT of surplus non-pit plutonium as contract-handled transuranic (CH-TRU) waste at WIPP via the dilute and dispose approach, also known as plutonium downblending. This disposition action was based on an analysis in the 2015 S*urplus Plutonium Disposition Supplemental Environmental Impact Statement* (DOE/EIS–0283–S2) and is currently underway.

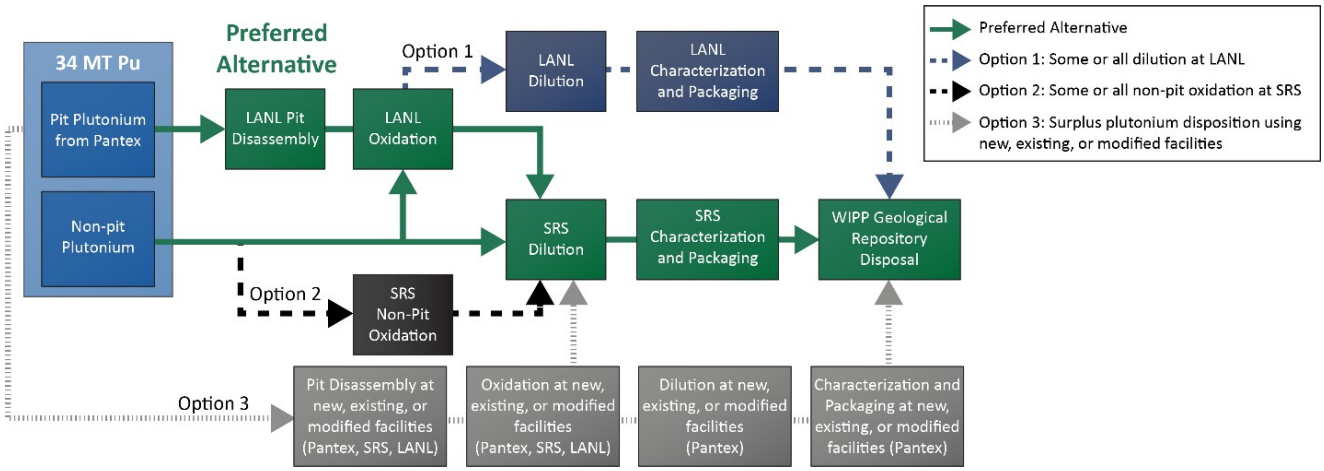
In August 2020, NNSA decided to dispose of another 7.1 MT of surplus non-pit plutonium via this same process based on the analysis in the 2015 *Surplus Plutonium Disposition Supplemental Environmental Impact Statement*. This 7.1 MT of surplus non-pit plutonium designated for dilution and disposal is a part of the 34 MT that was designated for MOX fabrication in 1999.

Pit Vs. Non-Pit Plutonium

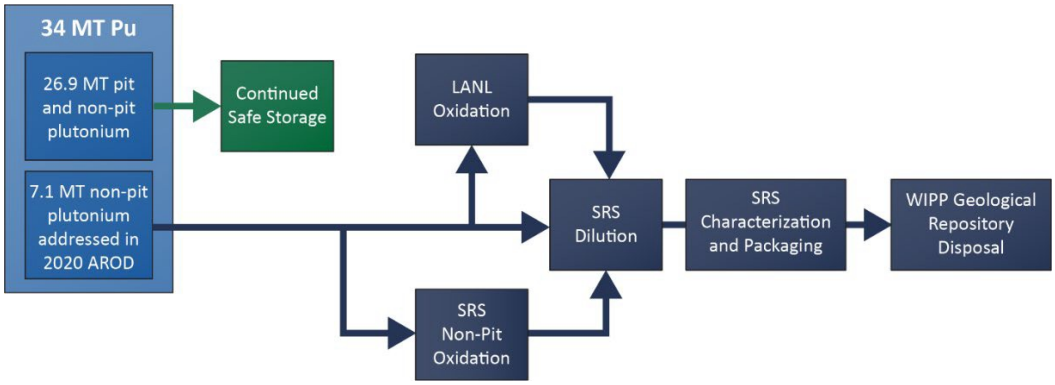
A pit is the central core of a nuclear weapon that principally contains plutonium or enriched uranium. Non-pit plutonium may be in metal or oxide form or may be associated with other materials that were used in the process of manufacturing and fabricating plutonium for use in nuclear weapons.

The Preferred Alternative for the Proposed Action. NNSA's preferred alternative for disposition of 34 MT of surplus pit and non-pit plutonium is the dilute and dispose, or plutonium "downblending", approach that uses existing technology and can be implemented decades sooner than the previously considered MOX approach. The dilute and dispose strategy utilizes an adulterant material to dry blend with the plutonium oxide. This produces a mixture that is not readily usable for weapons and can be safely disposed of at WIPP in New Mexico as CH-TRU waste. After downblending, the material is packaged into criticality control overpack containers (CCOs). The CCOs are metal drums approved for off-site shipment of the downblended plutonium. The CCOs would be characterized to verify compliance with WIPP waste acceptance criteria and then readied for shipment to WIPP.

The dilute and dispose approach would require new, modified, or existing capabilities at SRS, LANL, Pantex, and WIPP. As shown in the diagram below, the dilute and dispose approach can be accomplished via several options, all of which result in permanent disposition at WIPP. The preferred alternative entails pit disassembly and oxidation of both pit and non-pit metal plutonium at LANL followed by dilution, characterization, and packaging at SRS. Option 1 includes conducting dilution, characterization, and packaging process steps at LANL. Option 2 focuses on disassembly and oxidation of pit plutonium at LANL while oxidation of non-pit metal plutonium occurs at SRS, followed by dilution, characterization, and packaging of both the pit and non-pit plutonium at SRS. Option 3 entails pit disassembly, oxidation, and dilution at new, existing, or modified facilities at Pantex, LANL, and/or SRS.



The No Action Alternative. The SPDP EIS will include an analysis of the No Action Alternative consisting of (1) continued safe storage of surplus pit plutonium at Pantex and (2) disposition of 7.1 MT of non-pit plutonium using the dilute and dispose approach described in an August 2020 Amended Record of Decision (AROD) as published in the Federal Register (85 FR 53350).



The EIS Process. In accordance with NEPA requirements, NNSA is preparing the SPDP EIS to evaluate potential environmental, socioeconomic, and other impacts of the proposed action, including the preferred alternative and other alternatives that may be identified. The EIS process will ensure public participation in the evaluation and will include public engagement during the initial scoping process and review of the draft EIS. The timeline for this EIS, shown in the diagram below, was initiated with the Notice of Intent published on December 16, 2020 (Federal Register 85:242 p. 81460) and is projected to end with a Record of Decision in December 2022.

SPDP EIS Fact Sheet

*Dates are subject to change