



Savannah River Site Watch

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U.S. DOE Documents Obtained via FOIA Request Confirm “Mission Need” to Expand “Dilute and Dispose” Method of Plutonium Disposition at Savannah River Site, Replacing MOX

Dilute and Dispose Faces Hurdles, Including Capacity of WIPP Disposal Site in New Mexico

Columbia, South Carolina – U.S. Department of Energy documents confirm that DOE has officially justified disposition of larger amounts of surplus weapon-grade plutonium via “dilute and dispose,” an alternative to the mismanaged plutonium fuel (MOX) project at the Savannah River Site.

The “dilute and dispose” process would package and dispose of the plutonium as waste rather than processing it for use as nuclear reactor fuel. The disposal processes consists of mixing plutonium oxide with “stardust,” a secret inert material, into small containers that are then placed in drums for geologic disposal.

The documents, obtained by Savannah River Site Watch in response to a Freedom of Information Act request in November 2016, reveal DOE’s step-by-step approach in expanding dilute and dispose operations at SRS and other support sites, while at the same time terminating the unsustainable MOX project. As the dilute and dispose method is in developmental stages, the documents reveal that its full-scale deployment faces challenges.

One the “Critical Decision-0,” (CD-0) documents provided to SRS Watch, the “Mission Need Statement” prepared by the Office of Material Management and Minimization (M3) – of the DOE’s National Nuclear Security Administration (NNSA) – states that the aim of the program is to process “at least” 34 metric tons (MT) of surplus plutonium via dilute and dispose. The stated goal is to “process no less than 1.3 MT surplus plutonium per year for disposition” via dilute & dispose.

SRS currently is packaging small amounts of surplus weapons plutonium - plutonium removed from cans in storage that are being examined to determine the condition of the storage containers and plutonium contents - in a single glovebox in the K-Area. Medium-term plans are to add at least two more gloveboxes in K-Area to expand capabilities, though those details are not discussed in the obtained

documents. (See DOE budget request for Fiscal Year 2018 linked in “notes” below for more information about dilute and dispose plans in FY 2018.)

In the CD-0 documents, NNSA affirms that it “has decided to pursue a significantly less expensive and lower risk approach” while affirming that it is a “priority to remove certain plutonium inventories from the State of South Carolina.” Additionally, NNSA states that it supports a “close-out and disposition of the MOX Fuel Fabrication Facility (MFFF) and Waste Solidification Building (WSB) projects” at SRS.

The *Surplus Plutonium Disposition Project - Dilute and Dispose Approach* documents state that “the basic technical approach for disposition of surplus weapons-usable plutonium utilizing the Dilute and Dispose approach involves production of plutonium oxide followed by dilution of the oxide with inhibitor materials, packaging the oxide into approved containers, and shipping the diluted plutonium oxide to a geologic repository (presumed to be the Waste Isolation Pilot Plant) for permanent disposal.”

Underscoring that there are hurdles for disposal of downblended plutonium via geologic disposal in the Waste Isolation Pilot Plant (WIPP), which has limited capacity for plutonium waste, one of documents states that “DOE-EM will complete scope needed to support expansion of the repository footprint and extend operations through FY 2050. This scope is intended to support the WIPP Performance Assessment required for implementing the proposed disposition of surplus pit plutonium beginning in FY 2026.” For political, legal and technical reasons, expansion of the size of WIPP is now only speculative and any proposed expansion would face opposition in New Mexico.

NNSA states that its goal is “completion of Dilution Operations by FY 2047” and that spending would be around \$400 million annually, far less than the amount needed to make the problem-plagued MOX project viable. The \$400-million figure may overlook additional costs, including WIPP expansion and expanded infrastructure at Los Alamos to make plutonium oxide from plutonium “pits” removed from nuclear weapons. Given plutonium management problems at Los Alamos, increased plutonium oxide production at the site is not a given. Likewise, the capability to package and ship pits from Pantex would be a new mission with unknown costs.

“As it is clear that the problem-plagued MOX project is not technically or financially viable, we are supportive of other methods of plutonium disposition and all options should again be put on the table, including our preferred method of immobilizing plutonium in existing high-level nuclear waste at SRS,” said Tom Clements, director of the public interest group SRS Watch. “The MOX debacle demonstrates that rushing into a half-baked, under-funded project will produce poor results and we thus urge a go-slow approach in devising a new plutonium disposition method. The first priority must remain termination of the MOX boondoggle and safe, secure storage of plutonium at SRS and other DOE sites,” Clements added.

Plutonium has a radioactive half-life of about 24,000 years and will remain a danger for around 240,000 years (ten half-lives).

The obtained documents are dated August 2016 and were approved in September 2016, before Russia withdrew from the Plutonium Management and Disposition Agreement (PMDA) in October 2016. While the PMDA is no longer functional, it is believed that the U.S. will attempt to abide by certain security and safeguards provisions of the lapsed agreement.

Further, NNSA states that “As part of this planning, NNSA has completed pre-conceptual design for a Surplus Plutonium Disposition Project to support the necessary capability, and is planning to conduct an associated programmatic Analysis of Alternatives (AoA) for implementing the Dilute and Dispose approach.” It is unknown when that analysis would be finished but it is believed that it is now being conducted. Likewise, DOE is conducting a review of reuse of the abandoned MOX plant, a review which SRS Watch has learned includes the conversion of part of the facility to production of plutonium pits for nuclear weapons, a controversial proposal bound to face opposition.

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Notes:

Two “Critical Decision-0” (CD-0) documents on plutonium “dilute and dispose,” obtained from DOE via Freedom of Information Act (FOIA) request on July 6, 2017:

Surplus Plutonium Disposition Program Requirements Document for the Proposed Dilute and Dispose Approach, NNSA, Material Management and Minimization, M3-SR-16-0009, Revision 0, August 30, 2016, 21 pages, linked here:

http://www.srswatch.org/uploads/2/7/5/8/27584045/m3-sr-16-0009_spd_prd_final_releaseable.pdf

MISSION NEED STATEMENT, Surplus Plutonium Disposition Project Dilute and Dispose Approach, NNSA, Office of Material Management and Minimization (M3), M3-SR-16-0013, Revision 0, August 25, 2016, 14 pages, linked here:

http://www.srswatch.org/uploads/2/7/5/8/27584045/m3-sr-16-0013_spd_program_mission_need_statement_rev_0_final_releaseable....pdf

NNSA letter to SRS Watch, which accompanied documents above, dated July 6, 2017:

http://www.srswatch.org/uploads/2/7/5/8/27584045/foia_17-00032-k_clements_final_response_7-6-17.pdf

Other documents of interest:

National Defense Authorization Act for Fiscal Year 2018, passed House Armed Services Committee on June 29, 2017, allows for MOX termination by Secretary of Energy – see Chairman’s Mark and Committee Report at:

<https://armedservices.house.gov/hearings-and-legislation/ndaa-national-defense-authorization-act>

Full Committee Markup: FY2018 Agriculture Appropriations Bill and FY2018 Energy and Water Development Appropriations Bill, Wednesday, July 12, 2017 10:30 AM – the legislation contains only \$340 million for MOX construction, an unsustainable level that would keep the project on a termination track; Senate E&W is much less open to continuing MOX construction; House Approps markup info:

<https://appropriations.house.gov/calendar/eventsingle.aspx?EventID=394963>

DOE Budget Request to Congress for FY 2018, see MOX termination (request of \$270 million for termination activities), for example, at page 561 and “dilute and dispose” at page 553:

https://energy.gov/sites/prod/files/2017/05/f34/FY2018BudgetVolume1_1.pdf