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Plutonium Pits: Nuclear Weapon Triggers

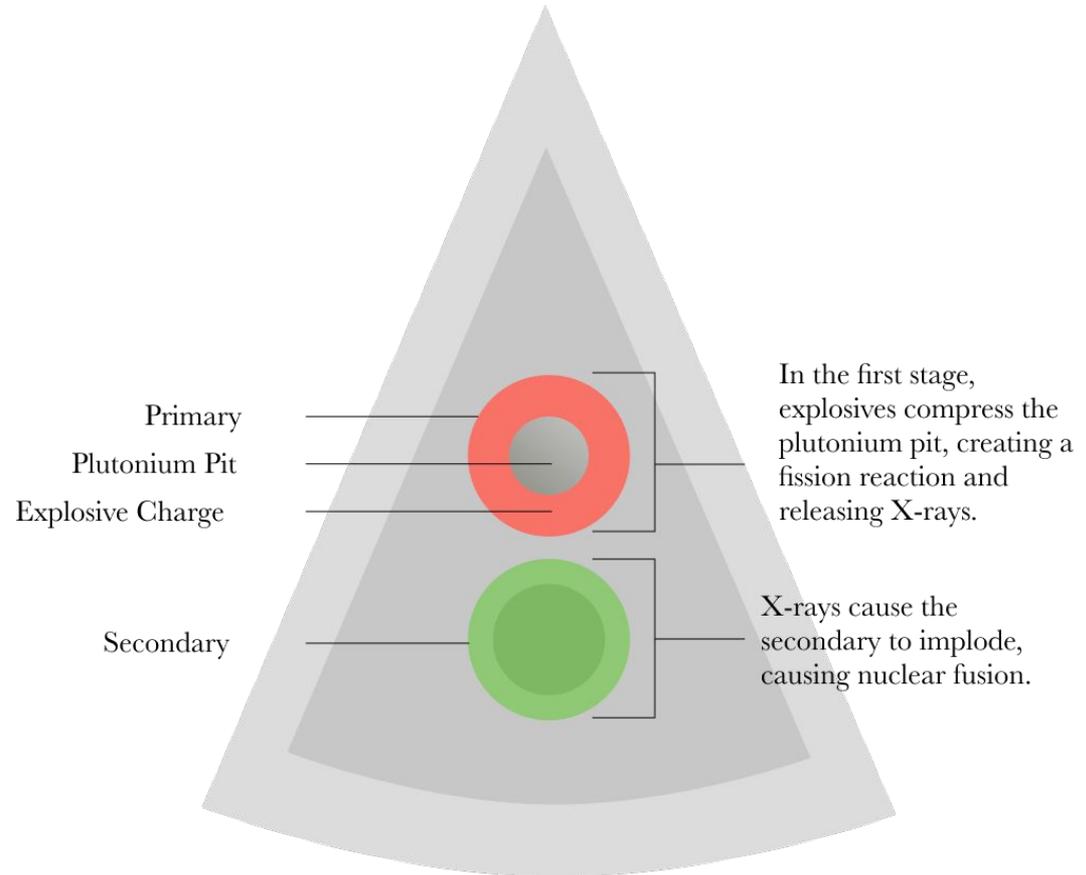
Plutonium pits are the fissile radioactive cores of nuclear weapons.

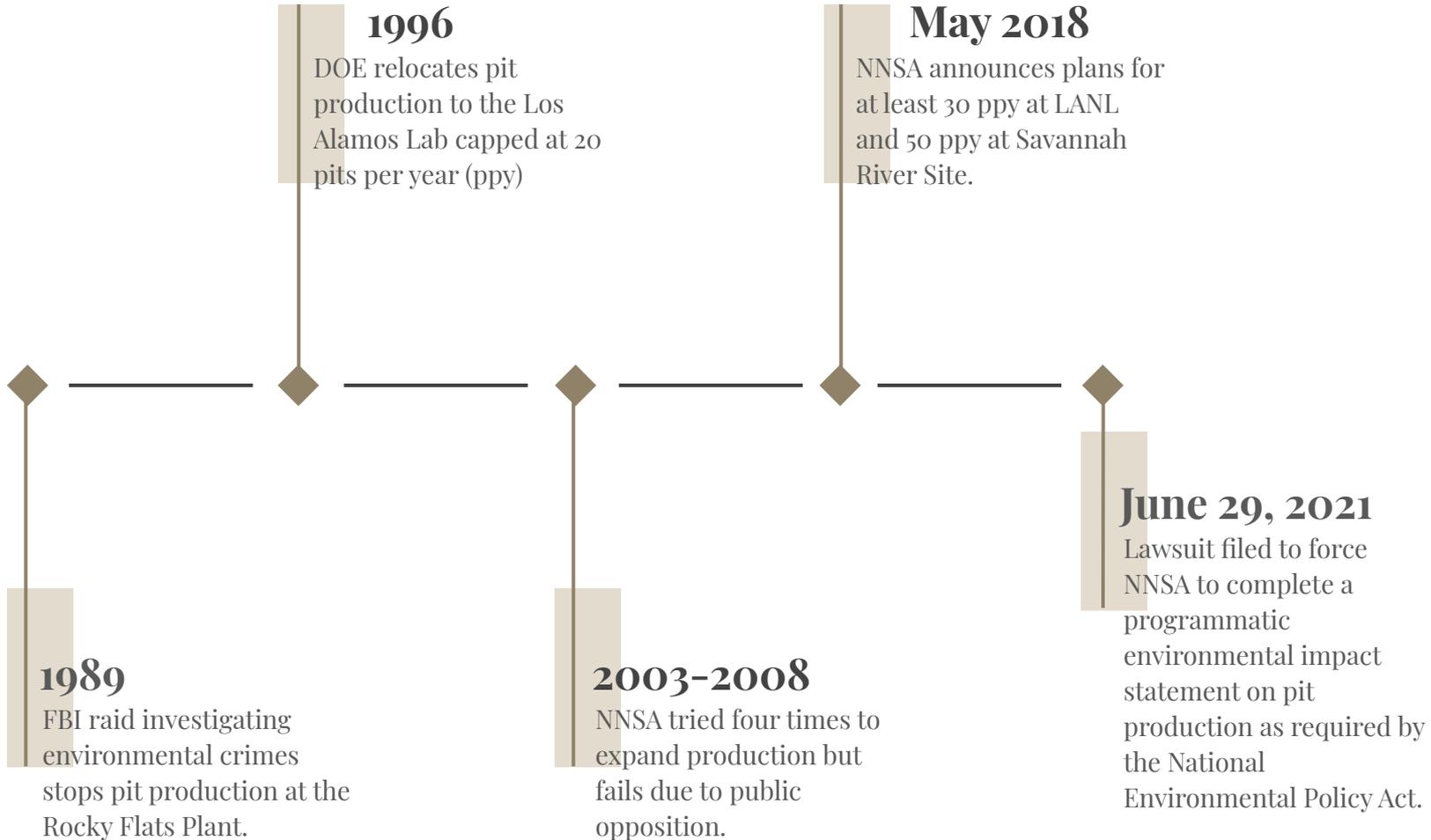
They are surrounded by conventional high explosives that together make up the primary.

Upon detonation the pit implodes, initiating a fission chain reaction.

That in turn triggers fusion in the secondary, which puts the “H” in H-bomb.

The Essentials of a Thermonuclear Warhead





1. 30 pits per year by 2026?

- Most pits produced in one year was 11 in 2011. None since then.
- LANL's pit production facility ("PF-4") is aging – began operations in 1978.
- Will delay at SRS prompt "surge" production of 80 pits per year at LANL?

2. Problems

- Chronic nuclear criticality safety issues – PF-4 shut down for 3 years.
- NNSA: potential public radioactive doses of 8.2 millirem. Independent Safety Board: 24 rem, ~3,000 x's higher.
- DOE Inspector General: LANL neglect "increasing the potential for a devastating wildland fire."
- Environmental justice? Northern New Mexico is 55% people of color.

Where will new pit production radioactive wastes go?

LANL has ~400,000 meters³ of existing wastes it plans to leave permanently buried.

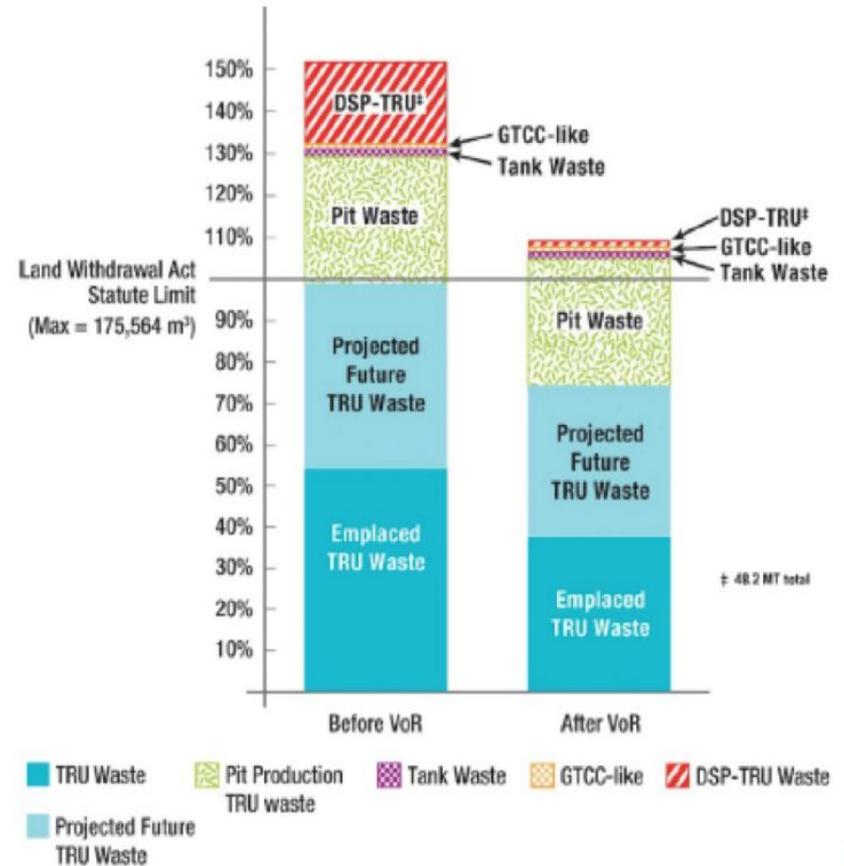
Serious surface and groundwater contamination in arid state.

Ruptured Lab waste barrel shut down the Waste Isolation Pilot Plant for 3 years.

Pit production will double LANL plutonium wastes for WIPP.

WIPP is permitted only through 2024 and is already oversubscribed.

Conclusion: All of these issues and more demand careful, deliberate programmatic review which NNSA avoids.



Review of the Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant (2020), National Academy of Sciences, Figure S-5

Savannah River Site Plutonium Bomb Plant

50+ pits per year in old MOX building



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- SRS has no history of pit production;
- After waste of \$8 billion on MOX, pit proposal surfaced;
- No congressional review of failed MOX project;
- Environmental Justice Impacts brushed aside;
- Impacts ignored of on-site disposal of low-level nuclear waste;
- No analysis of cumulative impacts of plutonium processing at SRS or of TRU disposal.

Storm clouds have gathered for SRS pit production

- Cost just doubled from \$4.6 billion to \$11 billion;
Schedule slipped from 2030 to as late as 2035;
- \$475 million requested for FY22 far too small;
- By mid-2020s, project will need \$1+ billion/year;
- Cost expected to soon increase with Critical Decision-1 (CD-1);
- Due to chronic NNSA mismanagement, MOX boondoggle repeat is developing;
- Slow down, prepare PEIS.



Initially for new nuclear warhead (W87-1) on new intercontinental ballistic missile - need not established

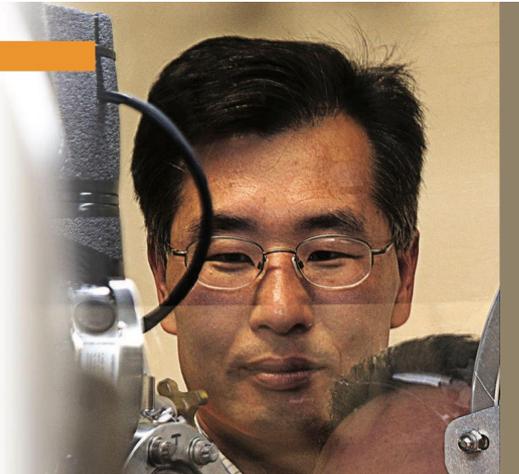
No need to build to untested pit-production facilities at the same time

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Research Highlights

Plutonium at 150 Years: Going Strong and Aging Gracefully

PLANNING the future needs of the U.S. nuclear weapons stockpile as well as the nuclear weapons complex depends in part on maintaining confidence in the long-term stability of the pit, or core, of plutonium-239



Pits in U.S. operational warheads are 33-44 years old, but their plutonium is aging so slowly, *they are projected to be functional for at least 100 years.* NNSA has launched a 10-year accelerated-aging program to see how much longer.

An early (2012) optimistic result from Livermore National Laboratory.

NNSA's priority is not to replace old pits but to produce new pits for new warheads

Focus is to replace three of the four warhead types deployed on U.S. long-range ballistic missiles with warheads less susceptible to plutonium dispersal accidents. (Such an accident has never happened to a ballistic-missile warhead.)

1. **Replace 200 W78s on 400 ICBMs with W87s. *But we already have 340 extra W87s available in storage.*** Additional W87s would be required only if nuclear arm reductions were to go in reverse and the US deployed three warheads instead of one on each ICBM. The 600 W78s could be kept in storage for such a contingency.
2. **Replace W76s and W88s on Trident II SLBMs.** NNSA says it will use a pit tested with insensitive high explosive. *There may be only one option in addition to the W87, the W89.* If that used a W68 pit, as widely alleged, there are thousands already stored at Pantex. *Why is NNSA not saying?*

Given these circumstances, there is no need to simultaneously construct two pit-production facilities of an untested design

Given the lack of a demonstrated near-term need for new pits, **it would be wiser to wait to see whether the pit production facility at Los Alamos works before deciding whether or not a larger copy is required at the Savannah River Site.**

In light of the struggles at Los Alamos to produce pits over the past quarter century, we have no reason to be confident that the pilot plant it now proposes to start up in 2026 will not require additional billions for modifications before it works properly. Startup of the SRS production facility has already slipped to 2032-5, six to nine years after the Los Alamos facility.

Why not wait to see if the design works at Los Alamos first?

Question: What's Driving NNSA Pit Production Plans?

MARYLIA KELLEY
Executive Director
Tri-Valley CAREs

Answer: NEPA “Connected Actions” Require Programmatic Review

- W87-1 elective design choices drive “need” and timeframe
- No pit production is scheduled for existing stockpile
- Reasonable alternatives exist and must be analyzed in PEIS

Unexamined Consequences: 7 sites across the U.S. with little analysis

Pantex (TX), NNSS (NV), Y-12 (TN), KCNSC (MO), SNL (NM/CA), LLNL (CA), and Office of Secure Transportation

- One example -
- Plutonium transport 1,100-miles from LANL-LLNL noted in a table
- Frontline/fenceline communities robbed of right to participate

