Project Overview
Savannah River Plutonium Processing Facility (SRPPF)
Savannah River Site
March 2021

Plutonium Pit Production History

- **Throughout the Cold War, multiple facilities and sites supported defense plutonium missions**
  - United States could produce over 1,000 pits per year at the Rocky Flats Plant in Colorado

- **Currently, the sole U.S. pit production capability is located in LANL's Plutonium Facility (PF)-4, which will be more than 50 years old in 2030**
  - The increased operating tempo will be a challenge and PF-4 is a single point failure for pit production and other plutonium missions

- **A delay in revitalizing this capability will necessitate a larger, more expensive recapitalization effort to mitigate loss of workforce expertise and multiple systems simultaneously reaching a point of low confidence**

- **Resuming a modest pit production capability to produce no fewer than 80 ppy drives the need for resiliency**
  - The former MOX facility at SRS is a security category 1/hazard category 2 structure that no longer has a mission need

Rocky Flats Plant

Plutonium Facility (PF)-4

Mixed Oxide Fuel Fabrication Facility (MFFF)

Plutonium Pit Production Requirements

Meeting the Department of Defense (DoD) requirement to produce no fewer than 80 war reserve pits per year by 2030

- **The requirement to produce no fewer than 80 ppy long precedes the 2018 Nuclear Posture Review and transcends Administrations**

- **Driving factors for no fewer than 80 plutonium ppy by 2030 include:**
  - **Safety & Security** – restoring this capability will produce pits with enhanced safety and security features
  - **Plutonium Aging** – plutonium is a radioactive material and changes over time
  - **Global Risk** – an evolving, uncertain geopolitical landscape calls for the United States to recapitalize defense plutonium capabilities
- **NNSA must extend the life of the U.S. nuclear stockpile for strategic deterrence**

Preferred Alternative

- **NNSA conducted an analysis of alternatives, engineering assessment, and workforce analysis to develop the preferred pit production alternative**

- **To develop an effective, responsive and resilient nuclear weapons infrastructure, NNSA's *preferred alternative* is to:**
  - Repurpose the former MOX facility at SRS to produce 50 ppy
  - Continue to invest in LANL to produce an enduring 30 ppy

- **This comprehensive approach:**
  - Capitalizes on enduring 30 war reserve ppy capability in PF-4
  - Retains LANL as the Plutonium Center of Excellence for R&D
  - Provides an effective infrastructure capable of flexible production rates
  - Executes the lowest risk alternative with shortest construction schedule; while utilizing PF-4 to build ahead as much as possible
  - Provides the Nation with an appropriately tailored, robust and **resilient** pit production capability

NEPA Status Update

Final Documents Added to Federal Register

- Sept 30, 2020—Final Environmental Impact Statement (EIS) for Plutonium Pit Production at SRS
  - NNSA prepared the Final EIS to evaluate the potential environmental impacts of producing a minimum of 50 war reserve pits per year at SRS
- Nov 5, 2020—Amended Record of Decision (ROD) for the Complex Transformation Supplemental Programmatic Environmental Impact Statement
  - Announced programmatic decision to implement elements of Alternative to produce a minimum of 50 war reserve pits per year at SRS during 2030
- Nov 5, 2020—ROD for the Final Environmental Impact Statement (EIS) for Plutonium Pit Production at SRS
  - Announced decision to implement the Proposed Action to repurpose the Mixed-Oxide Fuel Fabrication Facility (MFFF) to produce war reserve pits at SRS

SRPPF History

Nov 2015

- **Mission Need Statement approved (Revised March 2019)**
  "The mission of the Savannah River Plutonium Processing Facility Project is to provide high-hazard, high-security space to produce war reserve (WR) pits by 2030 to meet pit production requirements."

Oct 2017

- **Analysis of Alternatives identified two preferred alternatives:**
  1) **Refurbishment and repurposing the SRS MFFF**
  2) **New construction at LANL**
- **Recommended an Engineering Assessment to support an alternative selection**

Apr 2018

- **Engineering Assessment evaluated engineering feasibility and developed preconceptual designs**

May 2018

- **NNSA recommended a two-pronged approach to produce 80 ppy by 2030**
  1) **Repurpose the SRS MFFF, Building 226-F, to produce at least 50 ppy**
  2) **Continue to invest in LANL PF-4 to produce an enduring 30 ppy**

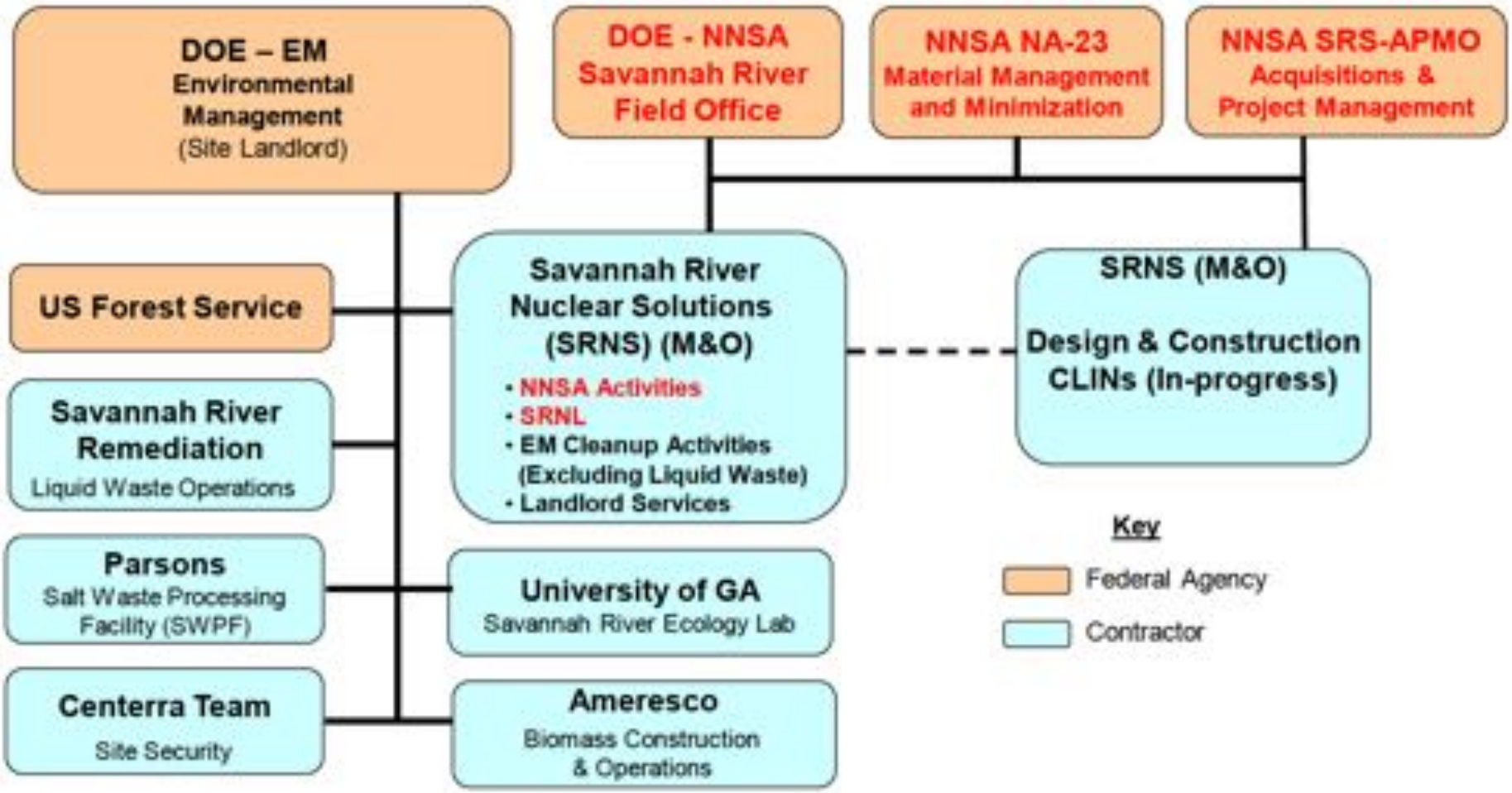
Sept 2018

- **NNSA Directs M&O to prepare plan for CD-1 by Jan 2019, CD-1 submittal by April 1, 2020**
  1) **NNSA issues Rev2 of PRD for 50 ppy at SRS, March 2019**
  2) **SRNS revises plan to CD-1 plan incorporating Rev2 PRD w/Fluor/LANL-Merrick inputs, Aug 2019**

Jan 2021

- **NNSA directs implementation conceptual design opportunities presented by SRNS April 2020, CD-1 sub. Dec 2020**
  1) **SRNS submits SRPPF CD-1 package, Jan 26, 2021 & 3-Alternative Estimates, Feb 26, 2021**
  2) **NNSA CD-1 Approval FY21**

SRS: Alignment of Federal Agencies & Contractors



*** SRNL in transition to separate M&O contract; Liquid Waste Operations and Site Security contracts in various states of contract acquisition

Key Contractor SRPPF Leadership and Roles

Contractor NNSA Capital Line Item Director: Responsible of for overall NNSA project portfolio management system. Ensures NNSA Capital Line project management system is integrated and optimized to plan, design, construct and start-up NNSA project portfolio in accordance with DOE/NNSA requirements and the established performance baseline. NNSA APMO Director is the primary interface.

Contractor Project Manager/Integrator: Responsible of overall management and integration of the project's scope, cost and schedule performance baseline. NNSA FPD is the primary interface.

Contractor Facility Design Authority—: Responsible for managing and overseeing project facility design requirements flow down and execution from PRD approval through CD-4 Nuclear Operation Readiness Authorization. NNSA SRS APMO Technical Director primary interface.

Weapons Design Authority— : (Los Alamos National Lab (LANL) & Livermore National Lab (LLNL)) Responsible for weapon design requirements. NNSA NA-192 Defense Program Manager primary interface

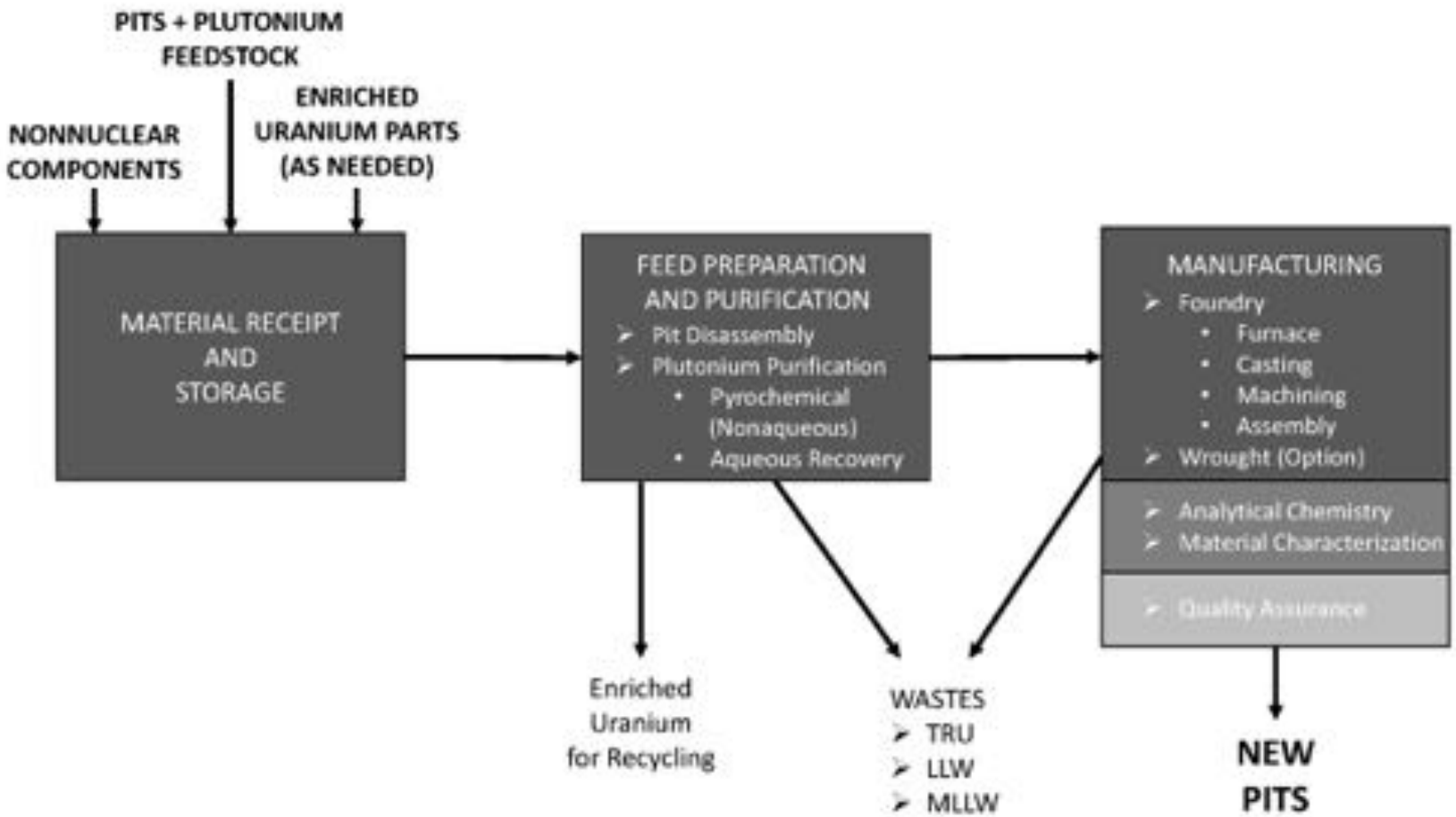
Physical Security Centers of Excellence (Sandia National Lab) – Responsible for Physical Security design agent and support to the NNSA Security Authorities.

Design Engineering Agency—: (M&O, Subcontractors, and PSCOE) Responsible for C/S/A design execution, design process control, design integration for production and special equipment, balance of plant design, and safeguards and security system design. NNSA SRS APMO Engineering Team Lead primary interface.

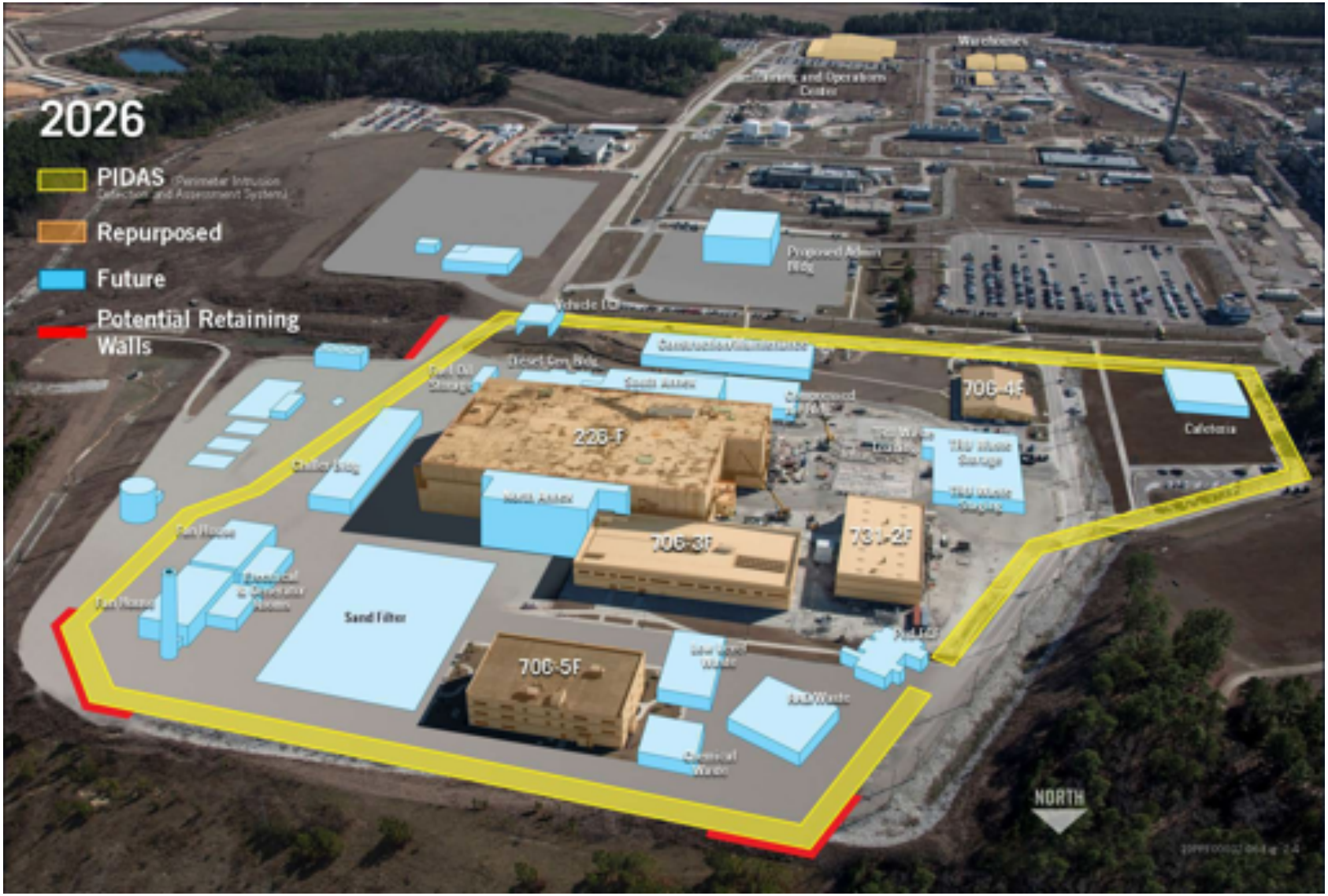
SRPPF Technical Approach

- Plan, design and construct a program and project to produce throughput of at least 50 ppy at SRS
- Establish separate CLIN(s) to optimize and incentivize EPC execution
- Repurpose MFFF Building 226-F for SRPPF
- Use LANL Flowsheet/Process and similar SFE designs (e.g. gloveboxes)
- Program & project knowledge transfer with LANL
- Leverage notable experience – e.g., Rocky Flats, LANL, Uranium Processing Facility, MPF(modern pit facility)
- Execution Strategy – Tailored sub-projects and phased approach

Pit Production Process



SRPPF Site Plan



SRPPF Tailoring Strategy and CD Phasing

Tailoring Strategy

- Five Subprojects
  - Process Buildings (Y799)
  - Utilities/Site/Infrastructure (Y808)
  - Administration Buildings (Y810)
  - Safeguards and Security (Y811)
  - Training and Operations Center (Y812)

Critical Decision Phasing Submittals

- CD-1: One combined submittal for the SRPPF Project
- CD-3*X*: As necessary, by subproject
- CD-2/3: As necessary, by subproject
- CD-4: As necessary, by subproject

Schedule Ranges: Critical Project Dates

Project CD Approval Key Milestones & Ranges	
CD-0	NOV 2015
CD-1	2021
CD-3a's	2022-2025
CD-2/3's	2023-2025
CD-4's	2027-2033

Challenges/Risks

1. **Nuclear NQA-1 Engineering, Procurement and Construction (EPC) Capacity & Capability:**
   - *Senior EPC Management Teams (been there done that lately), efficient processes/procedures*
   - *Not constrained to obtain top talent*

2. **Sufficient and sustained funding to support critical activities:**
   - *Long-lead equipment procurement necessary for producing pits*
   - *Early phased construction activities*

3. **Formulating, awarding and implementing a Contract EPC Terms/Conditions to share risk and incentivize a higher confidence of meeting the mission and project need dates:**
   - *NNSA Capital Line-Item Work is a primary performance mission objective*
   - *M&O contract & management system integration and interface is defined and tailored for EPC work*
   - *Completing work and the project in a safe, secure and quality manner on budget in support of the mission*