



NNSA Quantities and Production Rates

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— PERMANENT THREAT REDUCTION —

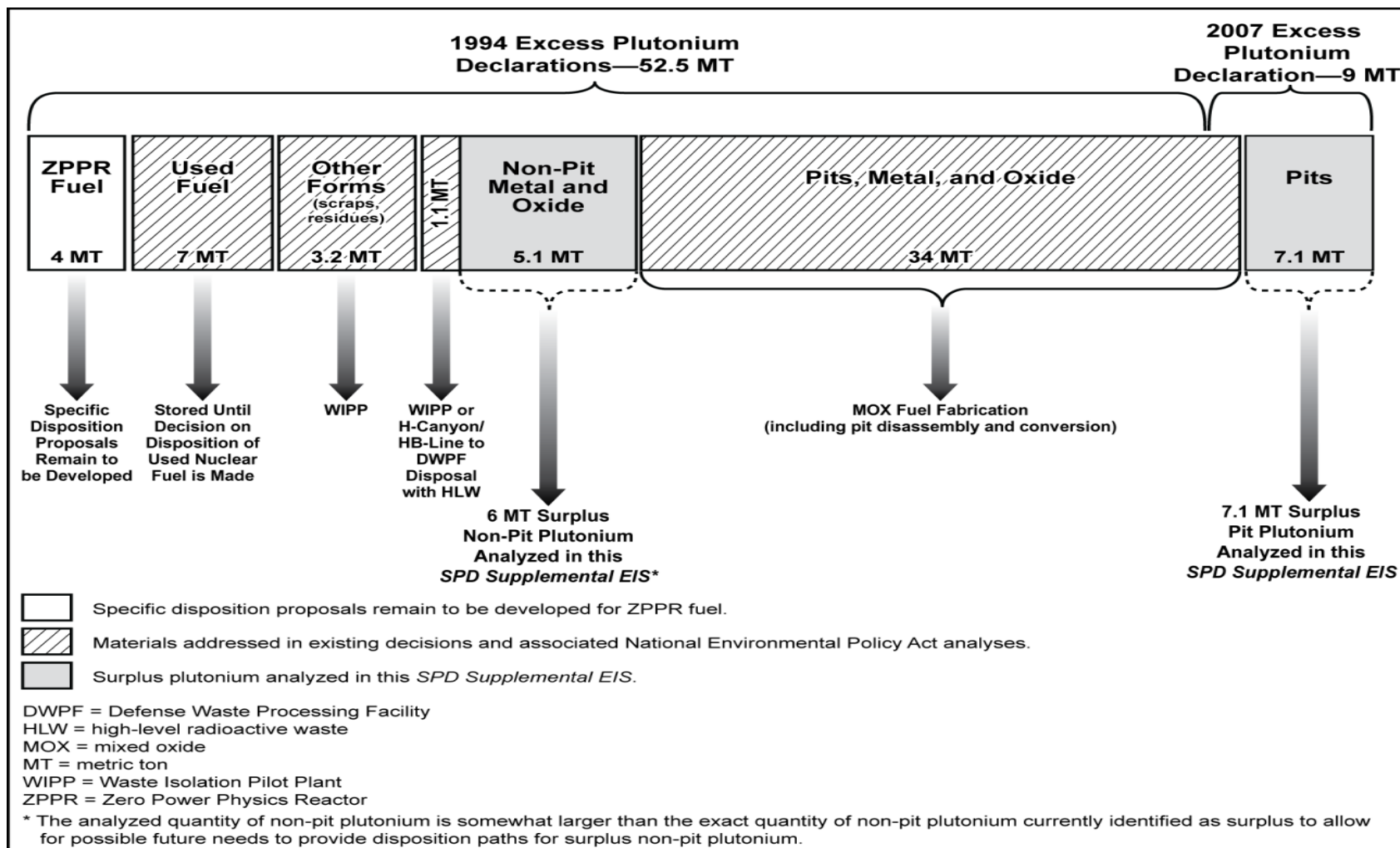
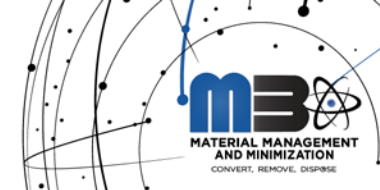


**MATERIAL MANAGEMENT
AND MINIMIZATION**

CONVERT, REMOVE, DISPOSE

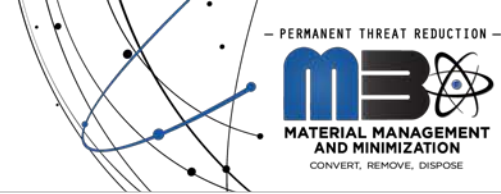
Reviewed and determined to be **UNCLASSIFIED**.
DC/RO: C. R. Dyer, Sr. QA Specialist
Date: 7/10/2018

U.S. Surplus Plutonium Inventory



Excerpt from Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement, DOE/EIS-0283-S2, April 2015

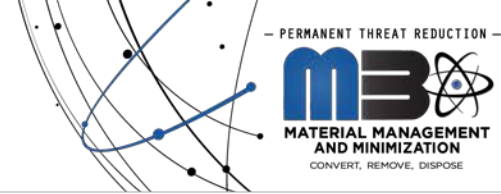
Production Rate Basis



Key parameters identified in the Program Requirements Document

- Complete modifications to support defined processing rates in the Dilute and Dispose Feed Table and to support program completion by FY 2050
 - LANL ramp up and steady state production rate
 - 2023: 220 kg/yr
 - 2025: 400 kg/yr (Additional equipment required beyond this point)
 - 2027: 600 kg/yr
 - 2031: 1,000 kg/yr
 - 2032: 1,400 kg/yr
 - 2033: 1,500 kg/yr
 - SRS ramp up and steady state production rate once SPD Project is complete
 - 2028: 150 kg/yr
 - 2029: 800 kg/yr
 - 2030: 1,250 kg/yr
 - 2032: 1,500 kg/yr (1,850 kg/yr including KIS)

Throughput Analysis



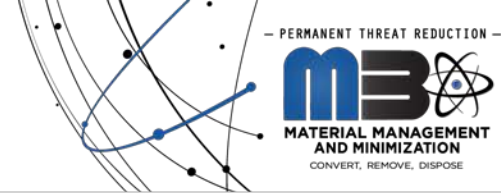
- LCCE developed a high confidence cost and schedule analysis for the dilute and dispose approach
 - Risk analysis and multiple models used to develop high confidence in Program execution
- Models
 - SPD Model – Focused on interfaces and interdependencies between sites and facilities
 - LANL Models – Developed for steady state ARIES operations
 - SRS Models – Developed for KIS operations and separate model for SPD project operations

K Model



- Models times and constraints involving material movements, staffing, staging, processing, equipment limitations, can configurations, dose rate, measurements, packaging, etc., taking into consideration planned and unplanned outages
- Includes capability to evaluate pinch points, dose assessment, equipment and staffing requirements
- Based on real operating durations
- “Dilute Operations” model was built from the “KIS Operations” Model

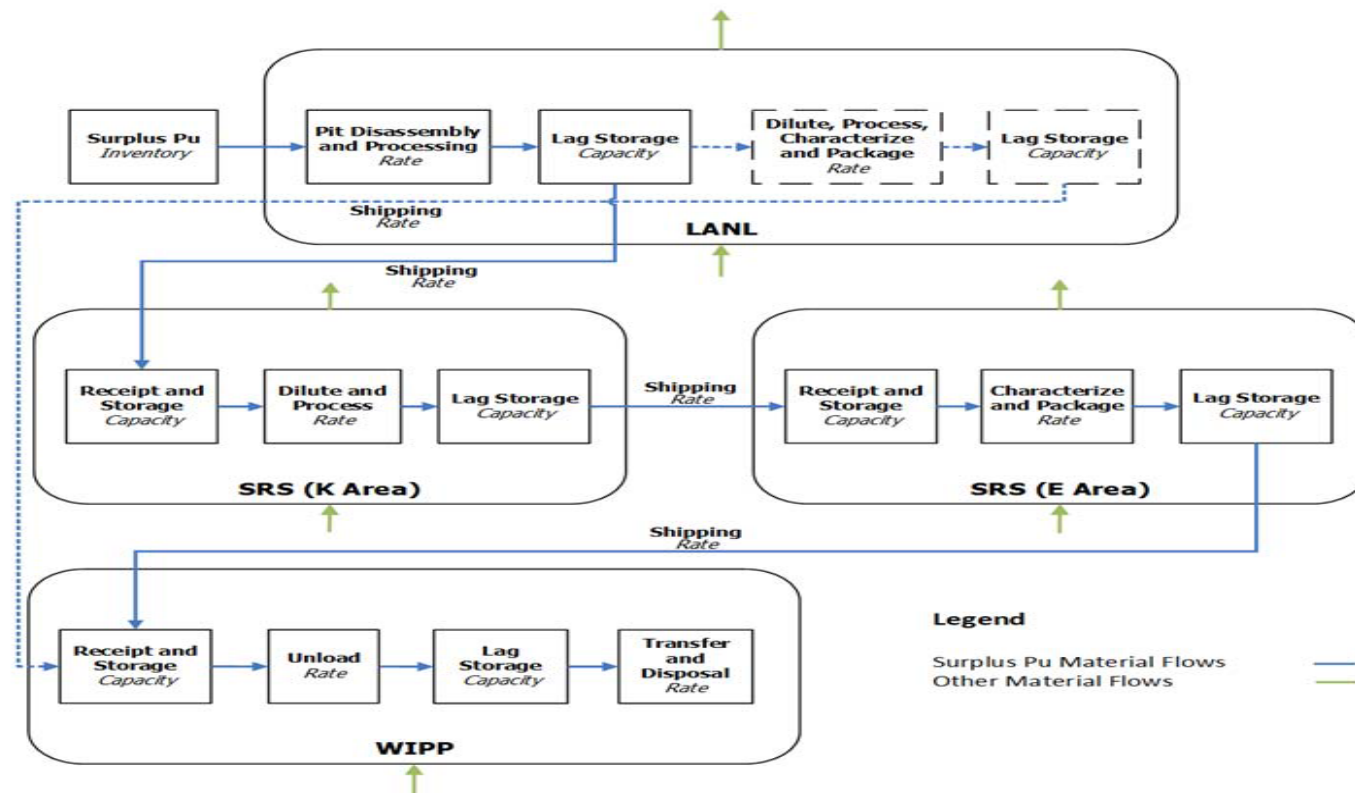
LANL Models



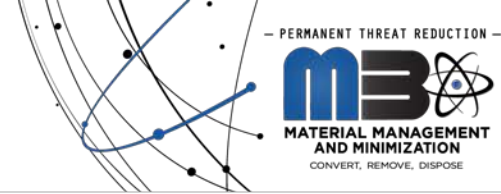
- Validates LANL's 1,500 kg/yr at steady state with the identified additional equipment and staff estimated in the LCCE
- Two models for ARIES process:
 - Deterministic model estimates equipment requirements
 - Discrete event model examines intricate process details such as batching logic, material movement and storage
- Models include:
 - Process data - process time, material flow, shift assumptions
 - Equipment and facility data - failure modes, failure frequencies, and repair times
 - Feed data - pit specific information
 - Layout data - for process flow
- Both incorporate process information from ongoing and historical operations in PF-4

Surplus Plutonium Disposition Integrated Model

- Models the interfaces between sites and facilities
- Includes system constraints involving facility processing rates, shipping rates, storage capacity, and other interdependencies
- Includes capability to evaluate unplanned facility downtimes, pinch points in lag storage and shipping uncertainties
- LANL and SRS models feed into the integrated model



Summary



- The LCCE developed a high confidence cost and schedule estimate (70 %) for the dilute and dispose approach if allowed to execute under the assumptions developed for the program
- NNSA incorporated numerous activities to reduce risk and provide the higher confidence in the execution of the dilute and dispose approach
 - Established security campaign plan
 - Performed repository performance assessment
 - Performed Risk and Opportunities Analysis
 - Developed Technology Readiness Assessment and Maturation Plans
 - Established site specific and integrated Simulation Models