SRNL and Savannah River Site Overview

- **Operated since mid-1950’s**
  - SRNL and SRS have Integrated Fuel Cycle Management Capabilities

- **Produced 301MT 4.95% LEU from 2003 to 2011 (TVA)**
  - Recycling of HEU and LEU Spent Nuclear Fuel (SNF)
  - Flowsheets analyzed and validated at SRNL

- **2020 SNF Recycling Operations**
  - High Flux Isotope Reactor (HFIR) Fuel
  - Material Test Reactor (MTR) Fuels
  - Liquid HEU Target Material

- **Currently Storing HEU Solution (~2MT 19.75% eq)**
  - Awaiting Decision on Next Steps
    - Blend-down to 4.95% -OR-
    - Dump as Waste –OR-
    - Produce HALEU?
Low Enriched Uranium Production

- Spent Fuel Recycling:
  - Recovered U is Blended Down
  - Loaded into LR-230s (Type B)
  - Transported to Commercial Fuel Vendor
  - Vendor Fabricates Fuel for Commercial Power Generation

Savannah River H-Canyon
(Purify and down blend to LEUN)

Irradiate in TVA Reactors
(Brown’s Ferry, Sequoyah)

Fuel Assemblies

BLEU Conversion Line
(AREVA)

BLEU Oxide

Fuel Fabrication Facility
(AREVA)

Richland, WA
(formerly in Erwin, TN)

Richland, WA
Capability to Produce HALEU

• ~2MT 19.75% HALEU (equiv.) in Tanks
  – Uranyl Nitrate Solution

• Significantly More Can be Produced
  – DOE Aluminum Spent Fuel (SRS, INL)
    • ~19MT & 13MT eq. respectively

• Evaluated Advanced & Research Reactor Specifications
  – Can Meet ASTM-C1462-00 (2013) for Advanced Reactors
  – Additional Laboratory Validation and Demonstration in Progress

MTR Research Reactor Fuel  High Flux Isotope Reactor Fuel Element  SRS L-Basin
Repurposing to Produce HALEU

• **Scopes of Work**
  – LR-230 Shipping Package License
  – Minor Flowsheet & Plant Modifications
  – NEPA – Record of Decision
  – Criticality & Safety Analysis
  – Natural Uranium (NU) Supply Contract
  – Staffing
  – Procedures & Training

• **Decision Timing**

  • Could Produce ~2MT (19.75%) HALEU in Late FY22
  • Could Start Production ~1-1.5MT/yr in FY23
  • Could Produce HALEU to Specified Enrichment
SNF Movement from Storage Basin to Recycling Facility

“70 Ton” Cask (used for Fuel Movement)

Cask Car in “Tunnel”
Research and Test Reactor SNF Recycling Capability

Overhead View of a typical Cell (half of Section shown)

Spent fuel bundle loading into Dissolver