Savannah River Site
Making Solid Investments for a Sustainable Future

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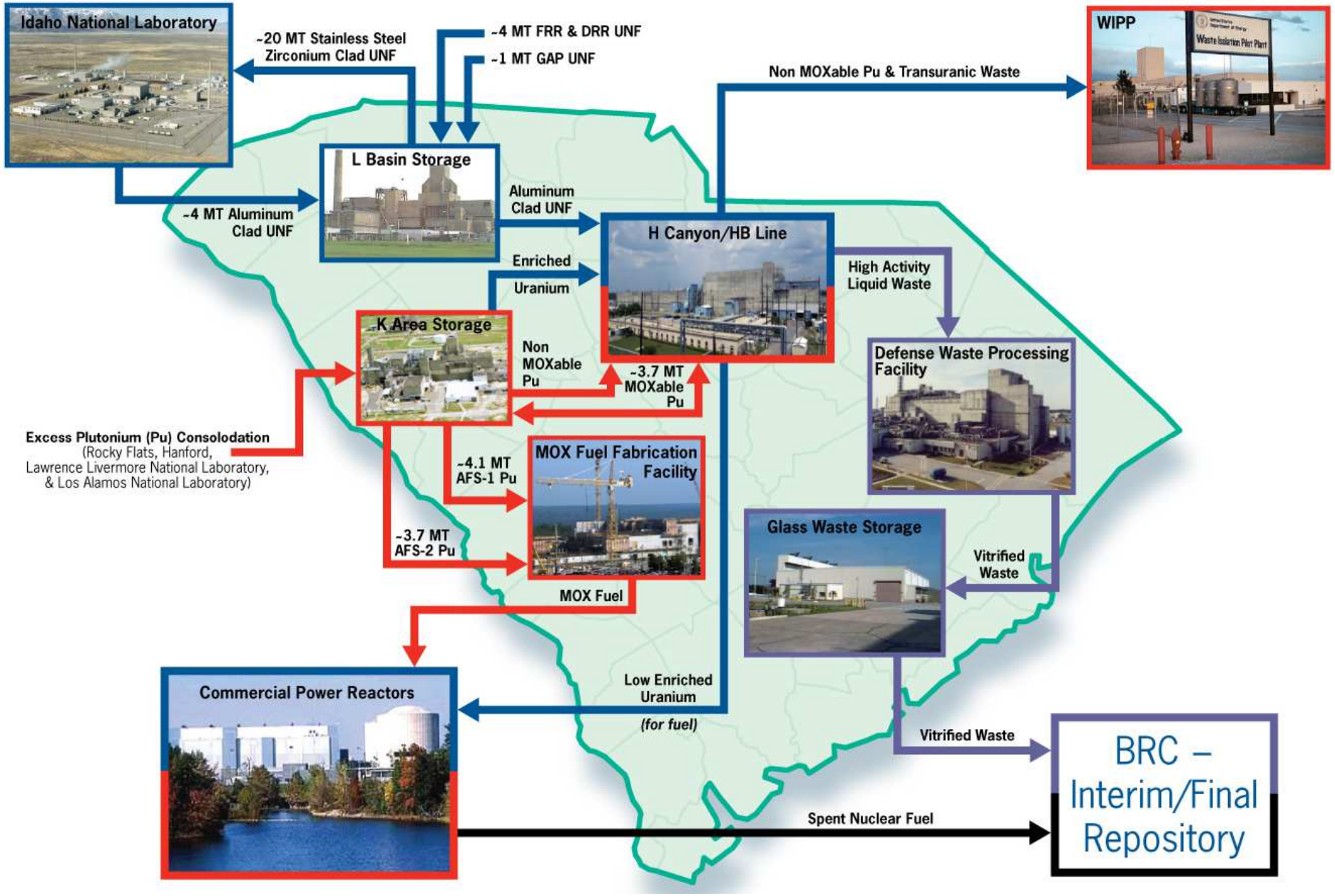
Waste Management Symposia 2013
Panel Session #16: Future Vision: A View of What the U.S. DOE Complex Will Look Like in 2020
February 25, 2013

SRS History of National Service

- Since the early 1950s, SRS has provided knowledge, technology and integrated solutions for our most pressing national needs.
- SRS pioneered the development of nuclear technologies and deployed those technologies at scales never before imagined.
- SRS accomplishments continue to stand at the core of our nation's nuclear deterrent.

Historic Photos (from left)
R Reactor in 1951
H Canyon in 1952

SRS Today – An Integrated Nuclear Materials Site



SRS Missions Remain Vital to our Nation

- Today, SRS continues to leverage our strategic investments to successfully fulfill key future missions of national importance
- Support the **Environmental Management** priority to safely and efficiently clean up the environmental legacy, reduce risk and protect public health and the environment
- Support **National Nuclear Security Administration** missions with key role providing future national defense capabilities (MOX, H Canyon)
- Support **Office of Nuclear Energy** goals to provide clean, reliable energy sources, reduce greenhouse gases, and enhance national security
- Put our **Nuclear Knowledge to Work** to transform SRS for a sustained future with new missions of national importance

SRS Evolution

- **Today: Environmental Management and Nuclear Materials Management**
- Threats to our country's security and prosperity are more complex than a single Cold War adversary
- Nuclear technologies, materials and processes play a vital role in nuclear energy, controlling the spread of nuclear weapons and mitigating environmental challenges.
- **Future:** enterprise·srs
- Use the knowledge of our nuclear materials workforce, Site assets and the strength of the national laboratory to address these national issues

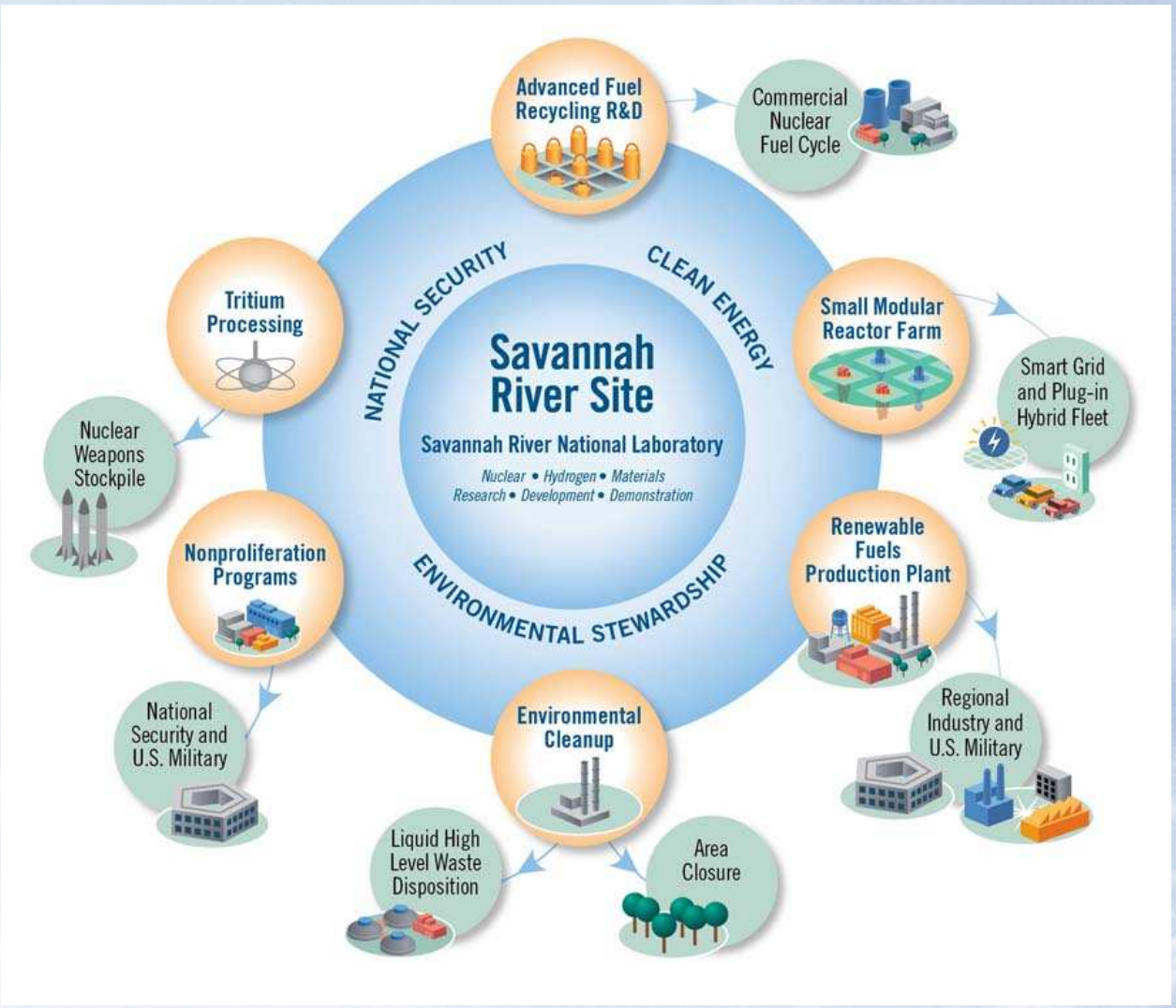
enterprise·srs

Provides the vision to revitalize assets and create an enduring, high-impact future for the Savannah River Site.

Environmental Stewardship

Clean Energy

National Security



Nuclear Knowledge for the Nation

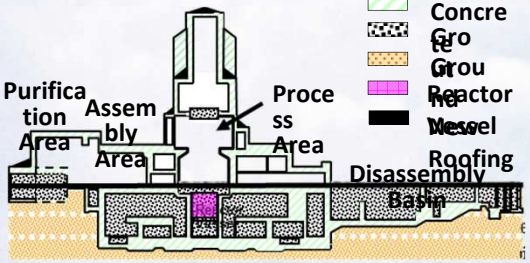
Environmental Stewardship: Our Foundation for the Future

Transform liabilities to assets to reduce the environmental legacy of nuclear materials and radioactive waste at SRS and provide innovative approaches that advance and improve SRS processing leverages solutions to other DOE sites and customers

- ✓ Lead development, validation and assessment of breakthrough technologies to accelerate current DOE national cleanup priorities
- ✓ Capitalize SRS competencies to solve the nation's nuclear materials disposition issues

Reducing Risk, Cost and Accelerating Cleanup

In-Situ Decommissioning

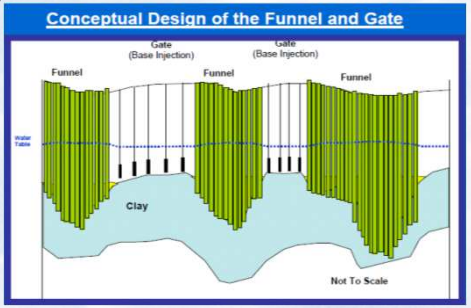


P Reactor after ISD

Liquid Waste Disposition

Tank Closures

Innovative Groundwater Cleanup



Salt Waste Processing Facility

ARRA Footprint Reduction: Environmental Cleanup Strategies at Work

P Disassembly Basin Demolition

P Reactor at Completion, September 2011

D Coal Pile Runoff Basin Drain Construction

HWCTR dome lift

Hazardous Waste Storage Facility Demolition

H-4 Basin Drainage Upgrades

F Underground Barrier Wall

235-F Stack Reduction (During & After)

Lower Three Runs Characterization

Clean Energy: Our Foundation for the Future

Accelerate the deployment of nuclear energy through public and private partnerships that solve critical nuclear material storage, processing and disposition challenges, utilizing the Site's expansive expertise to support regional energy sustainability

- ✓ Demonstrate clean energy systems
- ✓ Develop and lead the nation's used nuclear fuel cycle initiatives

Advancing Clean Energy Systems and Nuclear Energy Deployment

Biomass Cogeneration Facility

Biomass Cogeneration Facility at SRS, constructed and operated by Ameresco, began operations in December 2011

Savannah River National Laboratory

- Clean Energy Advancements
- Hydrogen Production and Storage
- Nuclear Fuel Cycle R&D
- Renewable Energy Research

Porous wall hollow glass microspheres

Off-shore wind research

National Security : Our Foundation for the Future

Enhance national security by applying unique SRS technology and systems assets to global nuclear nonproliferation, deterrence and threat reduction challenges

- ✓ Lead proliferant materials disposition
- ✓ Lead global nuclear nonproliferation and threat reduction systems solutions through R&D, analysis, forensics and demonstrations
- ✓ Lead national deterrence programs, including R&D and management of tritium and Helium-3 for the nation

Applying Assets to Deter Threats

H Canyon

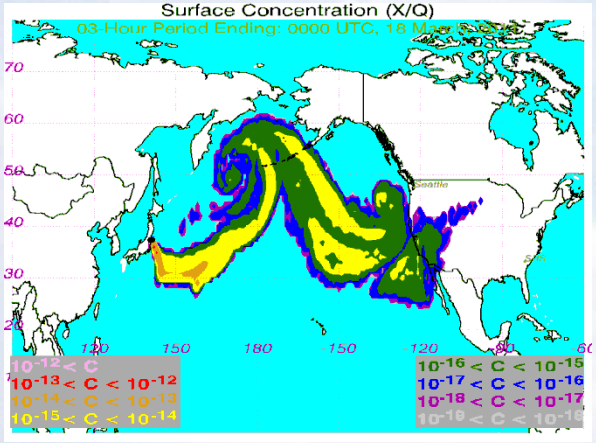
Operate the nation's only full-scale nuclear materials management complex

Mixed Oxide (MOX) Fuel Fabrication Facility:

Will convert weapons-grade plutonium to mixed oxide fuel

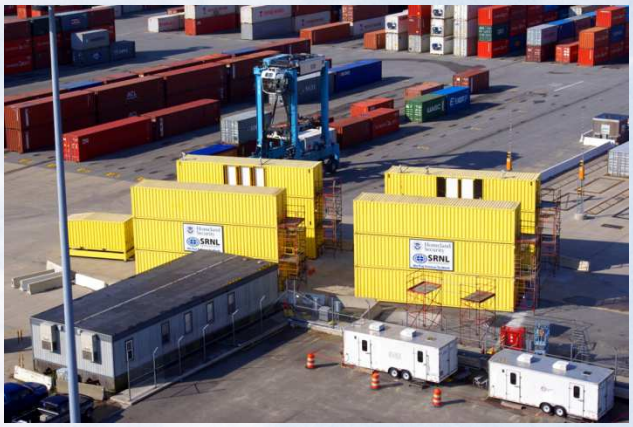
Managing Nuclear Threats

Collections & Signatures for National Security



Securing Proliferant Materials

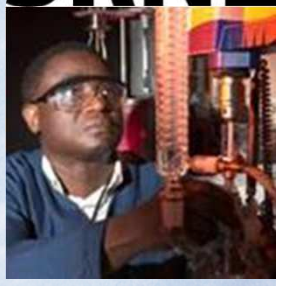
Protecting our Borders



Foundation for Our Future

- Offer one-of-a -kind assets and technologies to:
  - ✓ manage nuclear materials and waste
  - ✓ restore clean environments
  - ✓ deploy clean energy technologies
  - ✓ strengthen national security
- Key to our Nation's nuclear materials management strategy
  - ✓ operate Nation's only full-scale nuclear materials management complex
- SRNL technical expertise and innovative technologies applications deployed throughout the world
  - ➢ Nuclear Materials and Waste Management
  - ➢ Radiochemical Processing
  - ➢ Environmental Risk Reduction
  - ➢ Tritium/Hydrogen Technology
  - ➢ National Security Threat Reduction
- Strong partner in collaborations between multiple DOE and federal programs

SRNL



Positioning Ahead: Opportunities

- Nuclear weapons program
  - Expanded tritium role
- Nuclear non-proliferation
  - "Global threat" receipts & disposition
- Surplus weapons material disposition
  - Pu storage and disposition, isotope extraction
- Nuclear energy
  - Used fuel management, recycle
- Nuclear waste clean-up
  - International remediation solutions
- Homeland security
  - Nuclear surveillance systems

enterprise·srs Has Started

- Pu oxide production in H-Canyon
- Return of Swedish Pu
- Advising on cleanup after Fukishima
- Hanford Waste Treatment Plant solutions
- Detecting rad materials in shipping containers
- Training police to detect rad sources
- Resource sharing at Livermore
- Canadian Used Nuclear Fuel
- Foreign source He-3 feasibility study
- National Center of Radioecology
- Natural gas storage grant

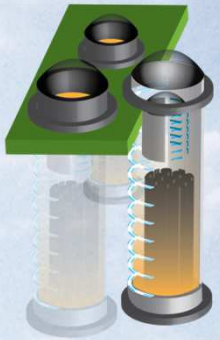
Solid Investments for a Sustainable Future

2020 Vision: Asset Revitalization has been realized at SRS *if*

- **Isotopes provided to government and industry, taking advantage of SRS unique expertise and facilities**
  - Americium-241 purified in H-Canyon (2-3 kgs annually) and provided to industry
  - Nation's supply of Helium-3 provided through industry partnership
  - Plutonium-238 for space exploration is purified and packaged for NASA at SRS

Helium-3 Extraction

- **SRS has key role in advancing Small Modular Reactors (SMRs)**
  - Capturing entire tritium mission of NNSA-SRS
  - NQA-1 manufacturing for SMR components regionally located and provides support to commercial power industry
  - HEU used fuel processed in H-Canyon and blended down (20%) to be the first charge in an advanced SMR



SMR Model

- **Regional nuclear medicine industry grown from partnership between SRS and local medical universities**
  - Initial production of cyclotron and SMRs forthcoming; isotope processing at SRS and patient studies at university hospitals

2020 Vision: Asset Revitalization at SRS shows solid results

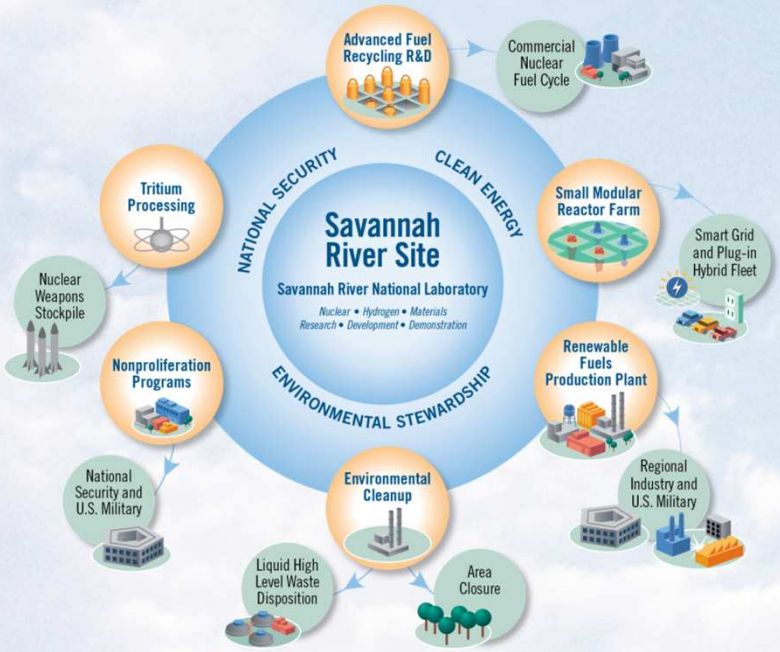
- **Continue joint industry/government collaborations to advance DOE projects and accomplish goals**
  - At-tank treatment successfully augmenting HLW processing at interim salt processing facilities
  - Increased throughput of ARP/MCU using next generation solvent and at-tank processing achieving 7Mgal annually
  - SWPF now processing tank waste using next generation solvent to meet 2028 cleanup commitments
  - SRS liquid waste program achieves steady rate of 10 – 12Mgal tank waste processed annually

ARP/MCU

- **Glass waste storage buildings (GWSB) 1 and 2 have been emptied and approximately 4000 glass waste canisters readied for transport to pilot storage facility scheduled to receive HLW and used fuel in 2021**
  - Lighter-weight shipping cask design licensed by NRC for more efficient transport of lower activity canisters

GWSB 1

How will we measure success?



- ✓ Recognized solutions provider.
- ✓ **Measurable progress.**
- ✓ Highly involved employees.
- ✓ **Stakeholder collaborations.**

- ✓ **Future leadership cultivated.**
- ✓ New missions secured.
- ✓ **Enduring future sustained.**