U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

# SRS Spent Nuclear Fuel Program Update

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**Presented to the CAB**
**Jan 2025**

# Deactivation and Decommission of DOE Facilities

- Facility Deactivation
  - Activities performed to transition a facility from a state of Operations to a passive and stable state that can be maintained and monitored for a long period of time at a minimal cost
  - A Deactivation Project Plan and End Points Document are written to establish a baseline scope of work
    - "End point" – specific task to accomplish objectives of deactivation are developed
    - Prepares buildings for long-term Safe Storage with minimal non-radiological hazards and stable radiological hazards
  - Includes activities that reduce or eliminate remaining hazards in the facility
    - Removal of chemicals, process material and hazardous components
    - Decontamination of radiological equipment, components and rooms
    - Isolation of the facility and its systems
- Facility Decommissioning
  - Final stage of disposition of a facility
  - Entails one of two alternatives
    - Demolition – the facility structure and contents are permanently removed
    - In situ disposal – when demolition is deemed impractical, the residual radiological contamination is permanently immobilized, and the remaining structure is sealed to prevent intrusion

# F/H Laboratory Deactivation Project

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F/H Laboratory Deactivation Project Manager

*Brief to SRS Citizens Advisory Board*

*January 28, 2025*

# F/H Laboratory - Background

- **F/H Laboratory Purpose:**

Initially provided laboratory services for F-Area and H-Area facilities (e.g., Canyons and Tank Farms) in support of chemical separations

- **Laboratory Services Later Expanded to Support Additional Missions:**
  - Special Heavy Water Analysis supporting the International Atomic Energy Agency (IAEA)
  - Asbestos Analysis for SRS and DOE Complex Wide Decommission and Demolition (D&D) Activities
  - Plutonium Metal Exchange Program with Los Alamos National Laboratory (LANL)
  - Performed Testing for IAEA and LANL using Thermo Ionization Mass Spectrometry (TIMS) and Inductively Coupled Plasma with Mass Spectrometry (ICP-MS)

**F/H Laboratory Buildings:**

- 772-F placed in service in mid-1950s – two-story structure (one above grade and one below grade)
- 772-1F placed in service in 1987 – one story with second floor supply HVAC room
- 772-4F placed in service in 1993 – Main exhaust ventilation building for 772-F
- Other support structures: Chiller Building/Cooling Tower; External Transformers; Standby Diesel Generator; External Storage Buildings

# F/H Laboratory – Layup and Deactivation (FY18 through FY24)

- **FY18: Project initiated to consolidate laboratory functions and transition analytical activities and personnel from F/H Laboratory to the Savannah River National Lab (SRNL) and B-Area Lab (BAL).**
  - Transitioned F/H Lab unused labs and containment units to “Layup” and began reducing hazardous materials, chemicals and radiological hazards
- **February 2021: Completed transition of Analytical activities from F/H Laboratory to SRNL and BAL**
  - Analytical Operations no longer performed in F/H Laboratory
- **September 2021: Approved Safe Shutdown and Deactivation Project Plan and End Points Documents**
  - Prepares buildings for long-term Safe Storage with minimal non-radiological hazards and stable radiological hazards
- **October 2021: DOE Authorized the Start of F/H Laboratory Deactivation**
  - Initiated deactivation of buildings 772-F and 772-1F. Deactivation Plan divided the buildings into Deactivation Zones, deactivating the higher hazard / radiologically complex zones first, working to lower hazard / less radiologically complex zones
- **March 2023: Adjusted the deactivation plan to deviate from zone deactivation for FY24**
  - Determined shutting down steam and water services was a large cost savings
- **May 2024: Shutdown Steam and Water services to building 772-1F**
  - Isolated (physical air gap) steam and water services to 772-1F
- **September 2024: Shutdown Steam to buildings 772-F and 285-3F**
  - Isolated (valved off) steam to 772-F and 285-3F

# F/H Laboratory – Deactivation (status – January 2025)

- **Completed Deactivation of 71 of 71 Gloveboxes**
  - All radiologically contaminated Gloveboxes have been deactivated
- **Completed Deactivation of 118 of 118 Radiohoods**
  - All chemical and radiologically contaminated Radiohoods have been deactivated
- **Completed Deactivation of 105 of 105 Radiobenches**
  - All chemical and radiologically contaminated Radiobenches have been deactivated
- **Completed Deactivation of 58 of 58 Labs**
  - All clean and radiologically contaminated labs, service chases and associated support rooms have been deactivated

## Active Containment Units


## Active Lab (Typical)

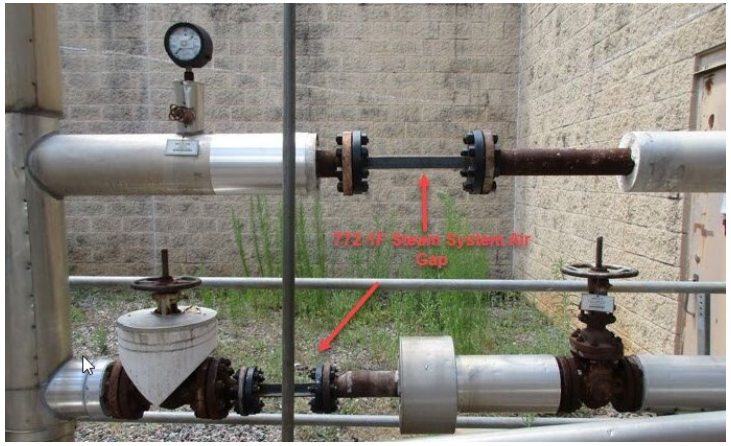
# F/H Laboratory – Deactivation (status - January 2025, continued)

- **Shutdown Exhaust Ventilation Systems**
  - Glovebox Exhaust
  - High Level Drain Exhaust
  - Low Level Drain Exhaust
  - Shielded Cell Exhaust
  - Vacuum System supporting analytical equipment

Typical Ventilation System

- **Shutdown and Performed Physical Air Gap of 772-1F Steam and Water Systems**
  - Steam system used for conditioned air
  - Chilled Water system used for conditioned air
  - Domestic water used for restrooms, safety showers and eyewash stations
  - Process water used for analytical services

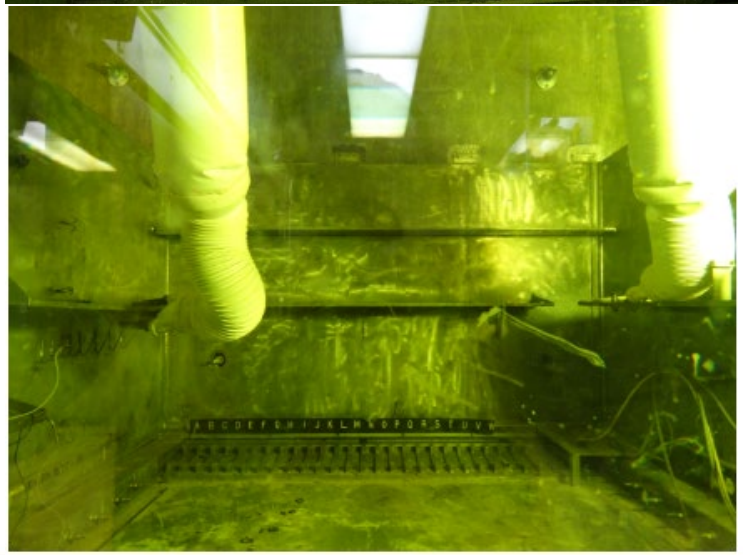
Typical Air Gap of Steam / Water System



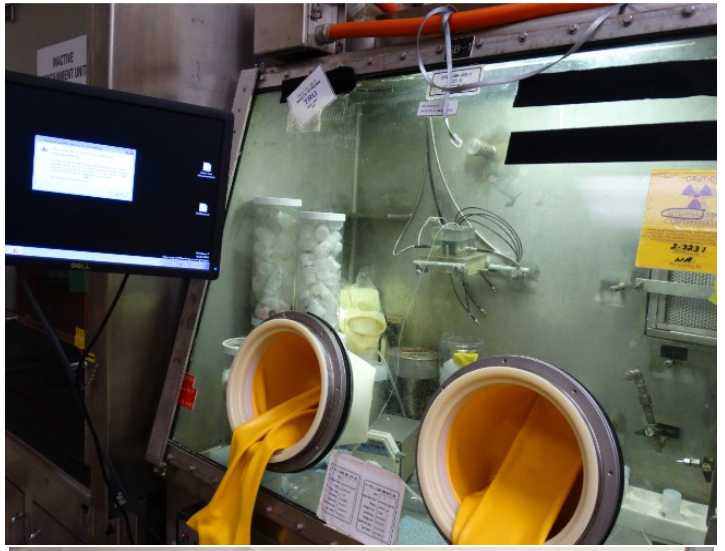

# F/H Laboratory – Deactivation (Before and After Deactivation Photos)

## Typical Lab Before/After Deactivation

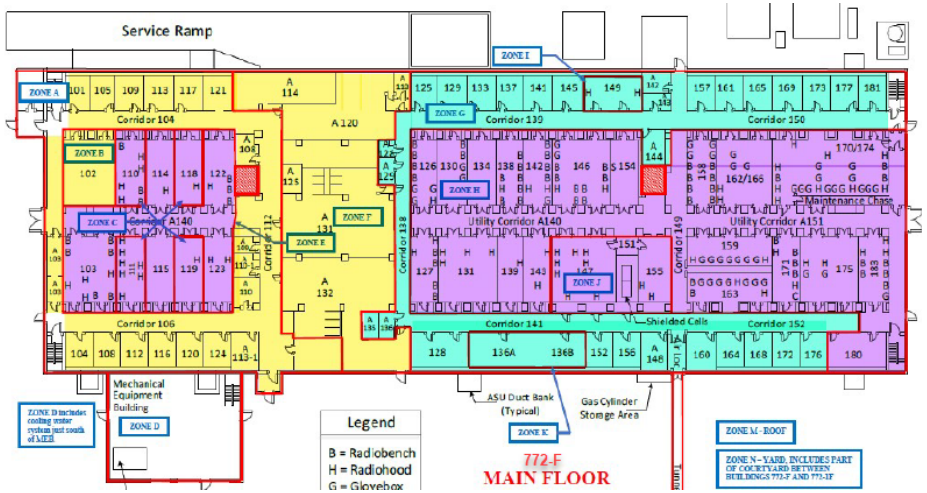
## Cells Before/After Deactivation

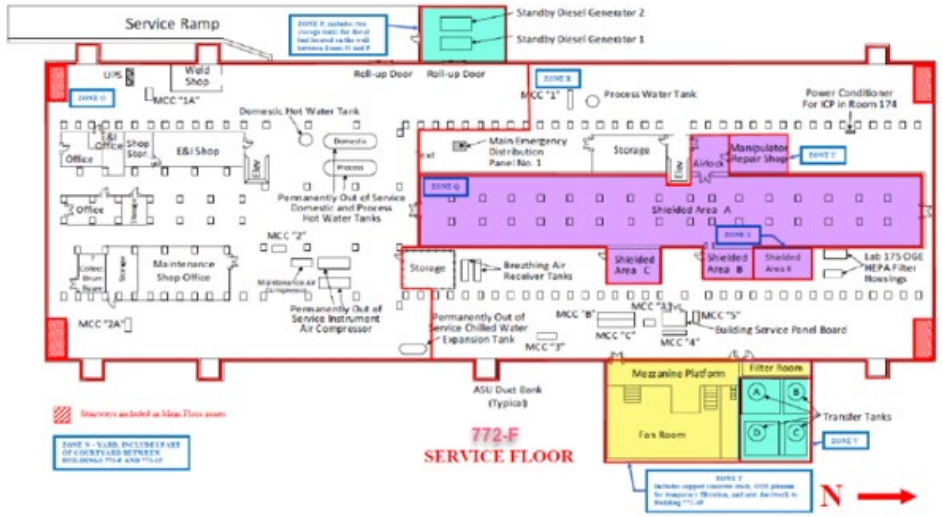


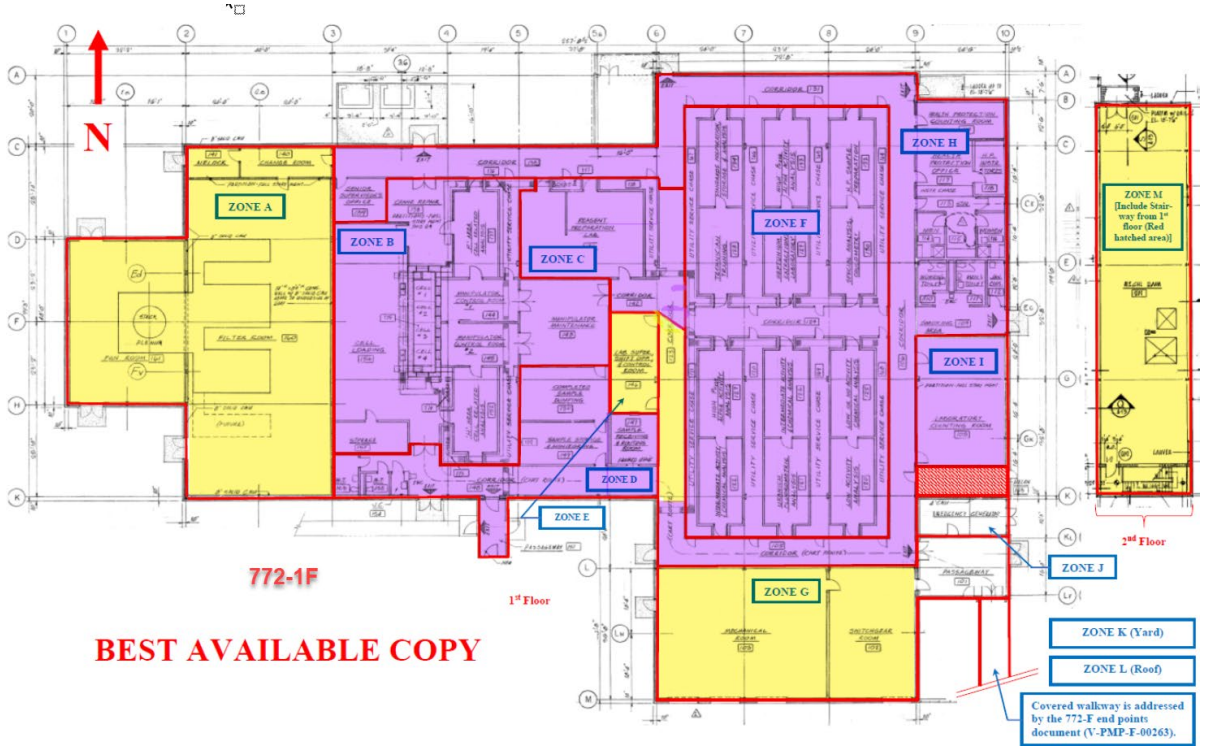
## Glovebox Before/After Deactivation



# January 2025 F/H Laboratory Deactivation Zone Maps

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| | |
|---|---|
| | Deactivation Complete |
| | FY25 Deactivation (PBI) |
| | FY25 Deactivation Additional Scope |

# F/H Laboratory – Remaining Scope to Complete Deactivation (FY25 - FY27)

## Building 772-1F

- Deactivate fire detection and alarm system
- Shutdown exhaust ventilation and isolate (air gap) exhaust ductwork to stack
- Deactivate diesel generator, fuel tank and electrical switchgear
- Complete electrical and mechanical isolations

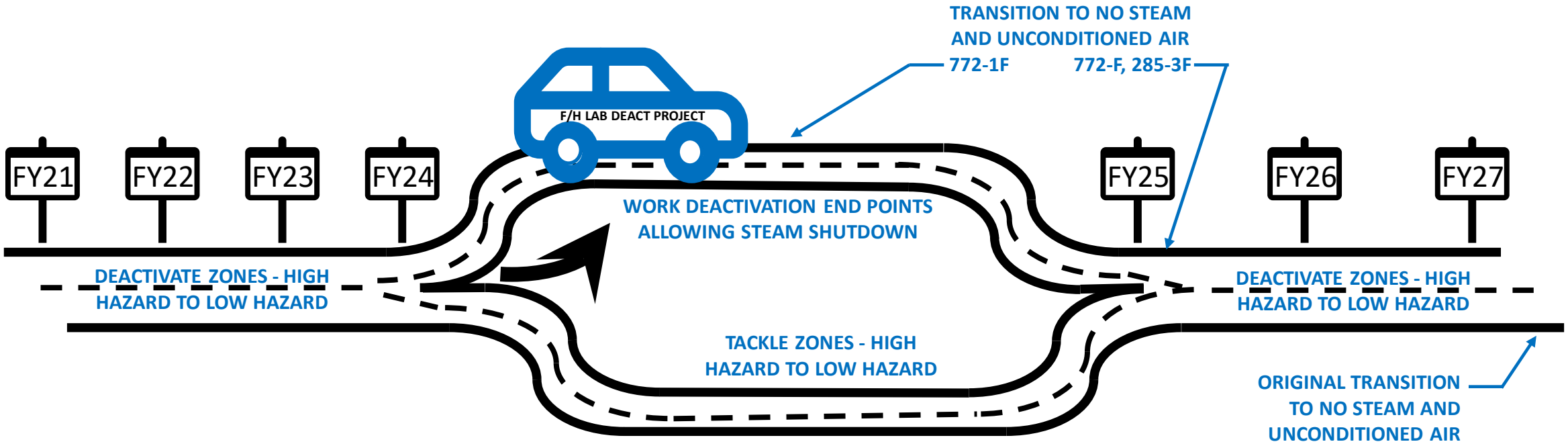
## Building 285-3F

- Isolate and drain steam and water services (Unconditioned Air)
- Remove hazardous materials (e.g., chemicals and refrigerant)
- Complete electrical and mechanical isolations

## Building 772-F

- Install remote monitoring project – allows equipment monitoring outside of F-Area
- Disposition remaining chemicals
- Isolate and drain steam and water services (Unconditioned Air)
- Deactivate fire detection and alarm system
- Deactivate Control Room – follows remote monitoring project completion
- Deactivate office spaces, storage areas and maintenance shops
- Deactivate diesel generators, fuel tanks and electrical switchgear
- Shutdown supply HVAC units and reduce exhaust ventilation to one fan
- Complete electrical and mechanical isolations
- Disposition four waste tank cells for long term rainwater intrusion management
- Complete Nuclear Measurement Assays to determine radiological holdup remaining in facility

# FY24 “PIVOT” from Typical Zone Deactivation to Unconditioned Air




- Mid-FY23, Organized Task Team to Review Deactivation End Points & Evaluate S&M Costs
- Identified Steam Usage as Significant S&M Expense (~$4M Annually)
- Determined Deactivation Could Proceed with No Steam, Unconditioned Air
- Made Decision to “PIVOT” to End Points Resulting in No Steam, and Unconditioned Air
- ~3-4M Annual Utility Savings Helps Fund Remaining Deactivation