

# Mound Box Sizing and Repackaging Project



Idaho Cleanup Project Citizens Advisory Board  
June 20, 2019

# Background – Mound Waste Boxes

- **74 large waste boxes that were shipped from Mound Laboratories in Ohio to Idaho during the height of the Cold War**
  - Mound produced components for nuclear weapons and thermoelectric heat sources for the U.S. space program
- **Boxes contained production gloveboxes, process components, and other industrial debris**



The larger Mound waste boxes (in yellow) would not fit into the boxlines at the Advanced Mixed Waste Treatment Project



Production glovebox

# Background – Mound Waste Boxes (cont'd)

- **Boxes required hands-on size reduction to remove inner waste components**
  - Easier boxes were addressed first followed by the more challenging ones
  - Inner waste components were sized-reduced to smaller portions allowing processing through the Advanced Mixed Waste Treatment Project's (AMWTP's) Treatment Facility
  - An enlarged, specially built enclosure complete with crane was added to Accelerated Retrieval Project VII to support the larger boxes



**Mound box that was transported from the Advanced Mixed Waste Treatment Project to the Accelerated Retrieval Project VII facility**



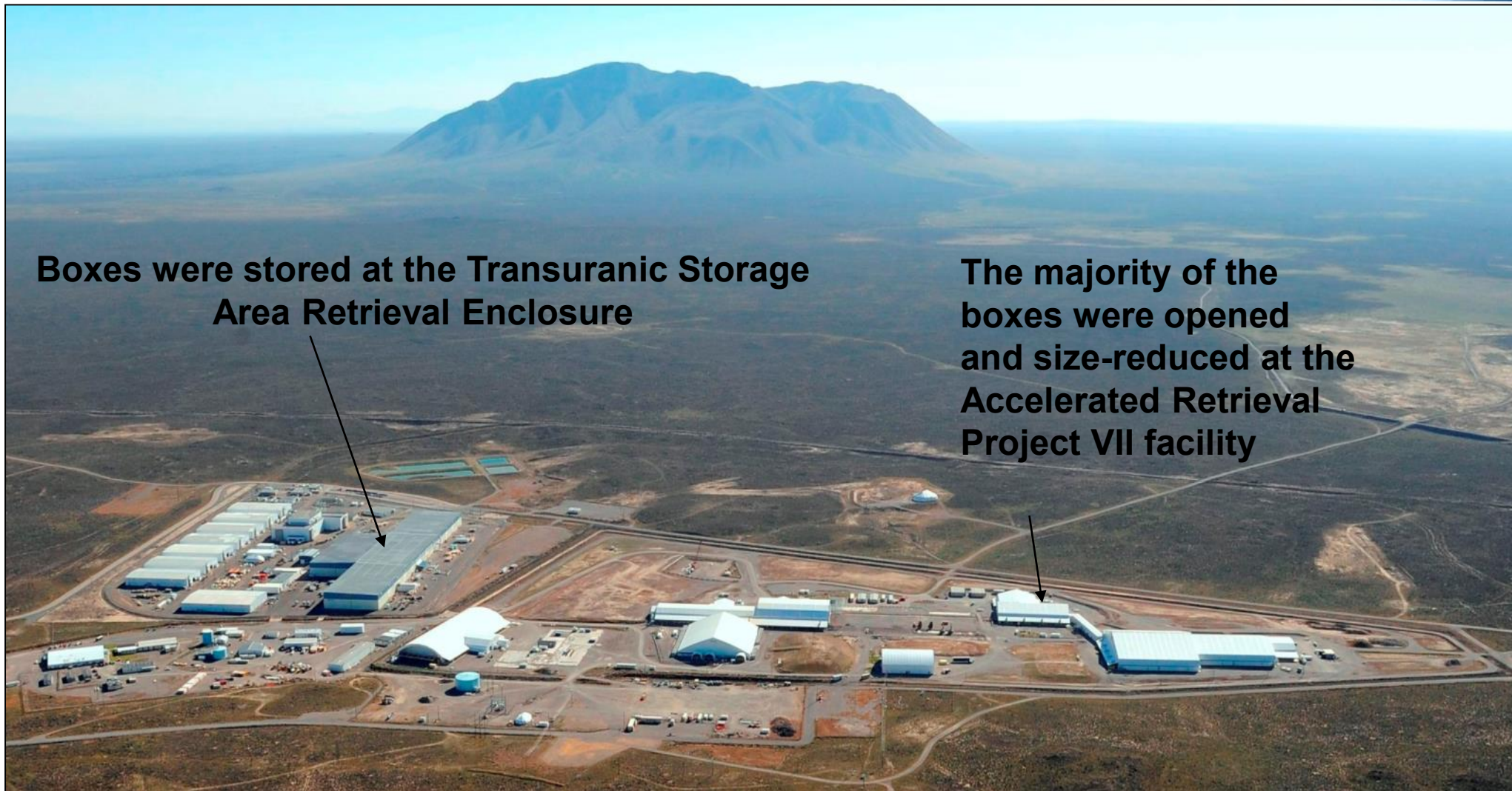
# Why were the Mound boxes such a challenging waste stream?

- **Physical size limitation – boxes were up to 10 feet tall and 14 feet long**
  - A large population of Mound waste boxes would not fit in the AMWTP's Treatment Facility
- **Many of the boxes contained plutonium-238, an extremely “flighty” and high specific activity isotope**
  - Complexity of the Pu-238 isotope required significant negative ventilation and filtration for worker and environmental protection
- **Hands-on operation**
  - Worker safety
    - Physically handling contaminated size-reduced components
  - Radiological protection
  - Hoisting and rigging
  - Transfer of contaminated components into waste boxes



Mound box size comparison in relation to people

# Mound box locations



**Boxes were stored at the Transuranic Storage Area Retrieval Enclosure**

**The majority of the boxes were opened and size-reduced at the Accelerated Retrieval Project VII facility**



# Accelerated Retrieval Project VII

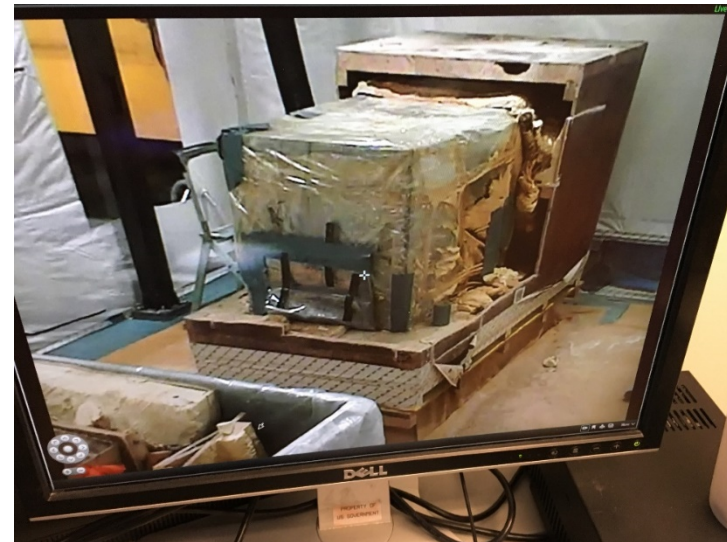


Subsurface Disposal Area with Accelerated Retrieval Project VII highlighted in blue

- Accelerated Retrieval Project VII was a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) buried waste exhumation facility
- The facility was later permitted under the Resource Conservation and Recovery Act (RCRA) to open boxes containing metallic objects too large for the AMWTP's boxlines, including the Mound boxes
- The facility has robust HEPA filtration for contamination control
- Off-the-shelf tools, such as a reciprocating saws, were used to size-reduce the Mound boxes



# Hands-on size reduction



Phased dismantlement of a Mound waste box



# Final Mound box at ARP VII

- Crews processed the last Mound box on April 18, 2019
- Last box was the greatest challenge from a contamination perspective
  - 789 million disintegrations per minute (DPM) loose alpha; 1.5 billion DPM fixed
  - Crews were able to process the box and its components safely, without issue



Personnel protective equipment and engineered controls kept workers safe



Ventilation and filtration controls were essential



Glovebox



# Final disposition of the Mound boxes

- Once sized, the Mound box contents are transported to the AMWTP's boxlines for further size reduction by the BROKK robotic arms
- Following repackaging in silver drums, the contents are crushed in the supercompactor
- The drum "pucks" are placed in 100-gallon drums and are shipped in TRUPACT-II containers to the Waste Isolation Pilot Plant for final disposal



BROKK robotic arm for sizing waste



Shipment to the Waste Isolation Pilot Plant



Supercompactor ram

# Summary

- **The Mound box sizing and repackaging project, although a challenge, was very successful**
  - Predominantly utilizing a repurposed CERCLA facility with a RCRA permit
    - Great support from the state of Idaho Department of Environmental Quality
- **Crews used simple tools for the job, such as a reciprocating saw**
- **A new crane was added to the enclosure to process large boxes**
- **Heavy reliance on engineered controls to protect workers and the environment**
- **Project was completed safely**



Mound waste box containing a glovebox