

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

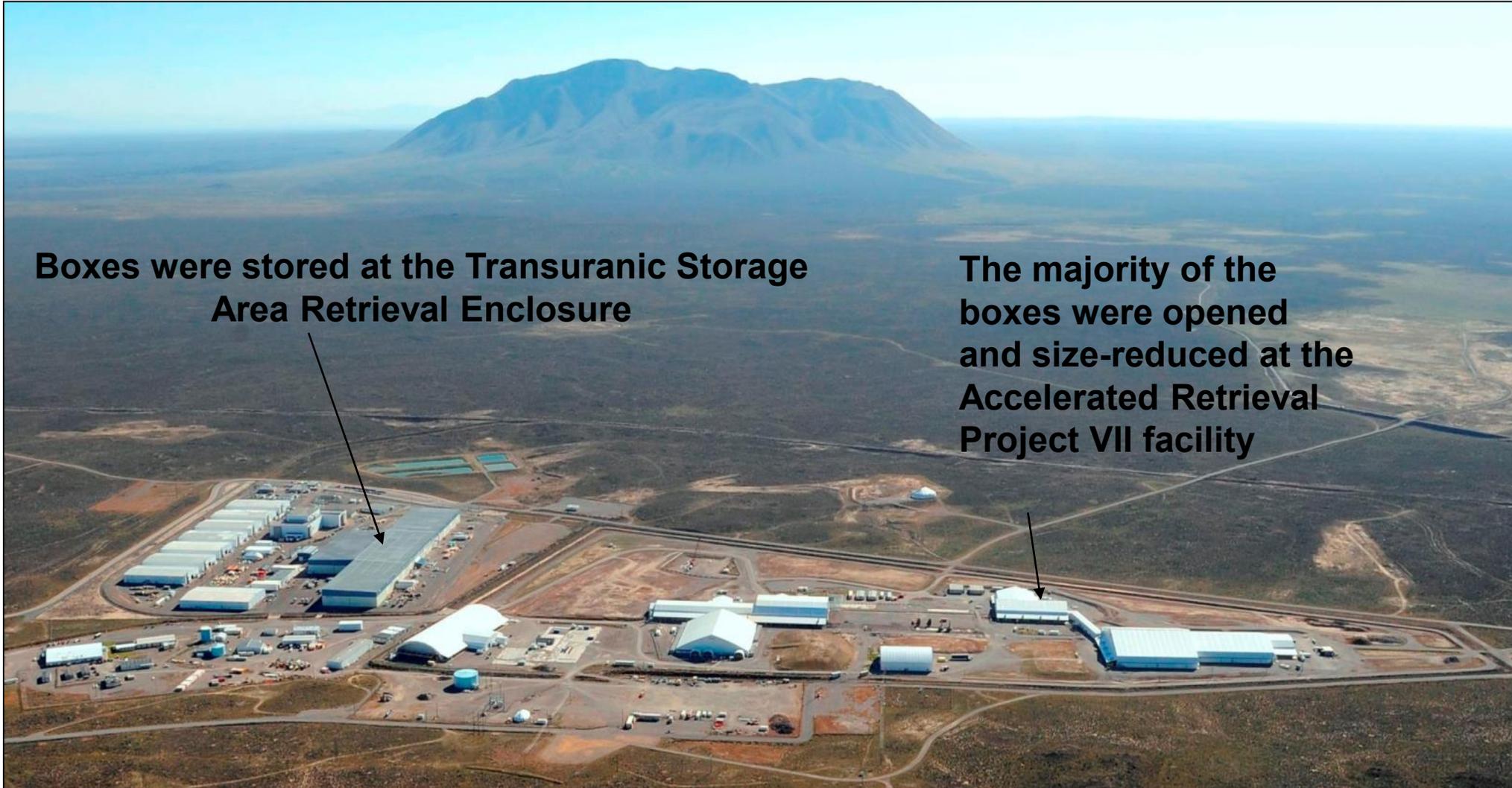
Why were the Mound boxes such a challenging waste stream?

- **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



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



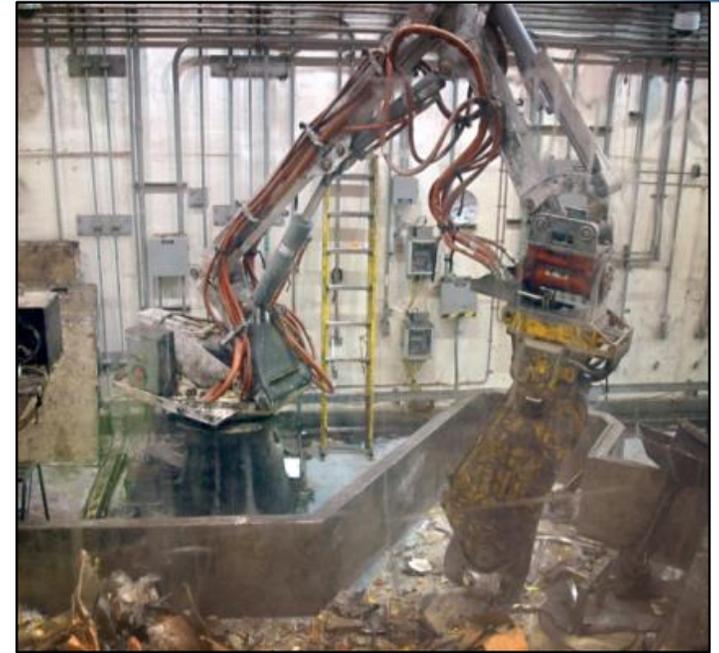
Ventilation and filtration controls were essential



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