WIPP Update
July 13, 2017
WIPP System Description

- WIPP site boundary is 16 square miles and contains 10,240 acres.

- The WIPP surface structures are surrounded with a chain link fence called a Property Protection Area. The fenced area covers about 35 acres.

- The surface structures inside the fence include:
  - Waste Handling Building
  - Four shafts to the underground
  - Underground Ventilation System
  - Interim Ventilation System
  - Water storage tanks and pump house
  - Trailers and warehouses
  - Engineering, Training, Security and Support Buildings
  - Maintenance Shops and Offices
WIPP System Description

- The surface structures outside the fence include:
  - Cell phone tower
  - Sewage stabilization ponds
  - Material staging/storage yards
  - Meteorological tower
  - Mined rock/salt piles
  - Evaporation ponds

- The underground facility is located centrally within the WIPP site boundary and covers a footprint of 550 acres

- The underground facility is located 2,150 feet below the surface in the bedded salt of the Permian Salado Formation

- The underground is connected to the surface by four shafts:
  - Air intake shaft, Salt Handling Shaft, Exhaust Shaft, Waste Shaft
Infrastructure Recapitalization

- Most of WIPP’s essential structures, facilities and properties were constructed in the 1980’s
- Many of the facility systems are now 30 years old and are at the end of their design life
WIPP Surface Facility Contribution to Mission

Waste Handling Building (WHB)

- Building where contact and remote handled (CH and RH) wastes are stored, processed and transferred to the underground for disposal
- Processes HalfPACTs, TRUPACT IIs and IIIs and 72-B shipping packages
- Connected to the WHB is the Waste Shaft Access Area, and TRUPACT maintenance facility
- Contains a HEPA filtered ventilation system

Waste Hoist Support Structure and Tower

- Five floors high
- The hoist is used to lower and raise waste packages, large equipment and personnel to and from the underground
- The hoist supports conveyance of 33 tons
- The hoist and tower are protected by the WHB fire suppression system
WIPP Surface Facility Contribution to Mission

Support Building

- Provides housing for administrative functions, change rooms, laboratories, and the Central Monitoring Room (CMR)

- CMR Operators monitor equipment functions, alarms and conditions associated with the surface and underground, such as ventilation and fire alarms
WIPP Surface Facility Contribution to Mission

Surface Ventilation Systems

- Designed to provide a suitable environment for personnel and equipment during plant operations and to provide radiological control during waste handling postulated accidents and process interruptions.

- Surface ventilation systems, where appropriate are used for space heating and cooling.

- Surface ventilation systems are designed to meet the emissions limitation for radiation protection of the public and the environment.
Ventilation – Current Status

- **Underground Ventilation System**
  - Provides 60K cfm filtered exhaust air
    - 3 fans/2 filter units
    - 1 fan in operation at a time due to filter housing design capacity
  - Provides adequate airflow through Panel 7 to meet the permit requirements for waste emplacement
  - Does not provide adequate airflow to conduct ground control activities in the north end of the u/g and emplace waste simultaneously

- **Interim Ventilation System**
  - Provides 54k cfm filtered exhaust air
    - 2 fans/2 filter units
    - Fans required to be operating for downloading waste per DSA
Ventilation – Current Status

- **Supplemental Ventilation System**
  - Establishes a clean air (mining) circuit at 70k cfm in the u/g to support mining operations and additional air in north end of u/g
  - One fan located in u/g between air intake shaft and salt shaft
  - Intake air pulled from AIS and exhausts non-filtered air up salt shaft
  - Measures air pressure between clean air (mining) circuit and disposal circuit at Panel 7 and interlocks SVS fan off, if airflow from disposal circuit is in direction of clean air circuit
  - Functional testing complete; turnover to operations by end of FY17

- **Waste Handling Building Ventilation**
  - Provides confinement ventilation for CH and RH processing
Safety Significant Confinement Ventilation System Project Status
New Filter Building

- The new Filter Building is a replacement ventilation system that will:
  - Provide 540,000 cfm airflow to the underground
  - Provide HEPA filtered ventilation of the currently contaminated underground spaces

- The new Filter Building provides sufficient capacity to support mine maintenance, mining operations, and waste emplacement to meet the DOE Complex TRU waste disposal needs to 2050

- The new Filter Building will be constructed on the East side of the WIPP Site
Safety Significant Confinement Ventilation System Project Status
New Filter Building General Layout

SERVING OUR NATION FOR FUTURE GENERATIONS. SAFELY DISPOSING OF THE NATION'S TRANSURANIC WASTE
WIPP Surface Facility Contribution to Mission

Shafts - continued

- **Waste Shaft**
  - Only means of lowering TRU waste for disposal
  - Route for power, control and communications cables form the surface to the underground
  - Used to convey large equipment to the underground
  - Contains an auxiliary intake tunnel for additional airflow to the waste shaft

- **Exhaust Shaft**
  - Path for exhaust air from the underground waste emplacement areas
WIPP Surface Facility Contribution to Mission

Shafts

- **Air Intake Shaft**
  - Primary source of intake air to the underground

- **Salt Handling Shaft**
  - Only means of hoisting mined salt and secondary source of intake air to the underground
  - Used to convey small equipment and personnel
  - Route for power, control and communications cables from the surface to the underground
  - Exhaust air for the Supplemental Ventilation System
WIPP Surface Facility Contribution to Mission

Fire Protection System
- Designed to ensure personnel safety, mission continuity and property conservation
- Consists of four subsystems:
  - Fire water supply and distribution system
  - Fire detection and alarm system
  - Fire suppression system
  - Radio fire alarm reporter system

Fire Water Supply and Distribution System
- Onsite 180,000 gallon storage tank
- Two fire pumps and a pressure maintenance jockey pump
- Water pump house
- Loop yard distribution system
WIPP Surface Facility Contribution to Mission

Electrical System

- Designed to provide normal and backup power, grounding for electrically energized equipment and other plant structures, lightning protection for the plant and illumination for WIPP surface and the underground

- Normal site power is supplied by a public utility company

- Uninterruptable power supplies provide battery backup to essential equipment during a power loss and prior to the backup diesel generators coming online
Mining and Emplacement

- Safety in the underground and waste emplacements are most efficiently accomplished through leveled production rates to support continuous waste receipt rates.

- Factors that determine planned receipts:
  - Base shipment receipt and emplacement rates
  - Waste Hoist and Salt Hoist Controller Upgrades
  - Continuous diligence on ground control
  - Ventilation capacity impacts on ability for simultaneous waste emplacement and mining activities
Waste Emplacement Rates FY17 - FY26
Estimated Shipment Projections

Projected Shipments (FY17 - FY26)

Fiscal Year

Projections are based on availability to ship ~ 43 weeks per year
Land Withdrawal Act
Limits the Capacity of TRU Waste

- The WIPP mission is to permanently dispose of 175,565 cubic meters of TRU and TRU mixed wastes in accordance with the WIPP Land Withdrawal Act capacity – WIPP Land Withdrawal Act (Public law 102-579)

- As of April 8, 2017, WIPP has disposed of approximately 91,000 cubic meters (about 52% of the Land Withdrawal Act volume limit)
Closure of the South End

- Initiated preparations for the closure and ultimate withdrawal from the far south end (equivalent to Panel 9)

- Cribbing, ventilation curtains and geo-mechanical instrumentation to be installed in the south mains

- Regulatory approvals for final closures - 2+ years with implementation to follow

- Loss of “Panel 9” equates to approximately 1 ½ disposal rooms of waste
Panels 7, 8, and 10

WASTE DISPOSAL PANELS

AIR INTAKE SHAFT

SALT HANDLING SHAFT

SERVING OUR NATION FOR FUTURE GENERATIONS. SAFELY DISPOSING OF THE NATION'S TRANSURANIC WASTE
## Potential Regulatory Work

**Description**

- Panel Closure Redesign
- New Shaft
- New Filter Building
- Additional Panels (utilization of Panel 10 and construction/authorization to use Panels 9B, 10B, 11)
- Revised Training Plan
- Revise Calculation Method for Waste Volume (volume of record)
- Updates and Efficiencies
- Compliance Recertification Application (CRA) - 2019
- 10 Year Permit Renewal

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Questions?