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# Perspectives on Plugging and Sealing a Salt Repository

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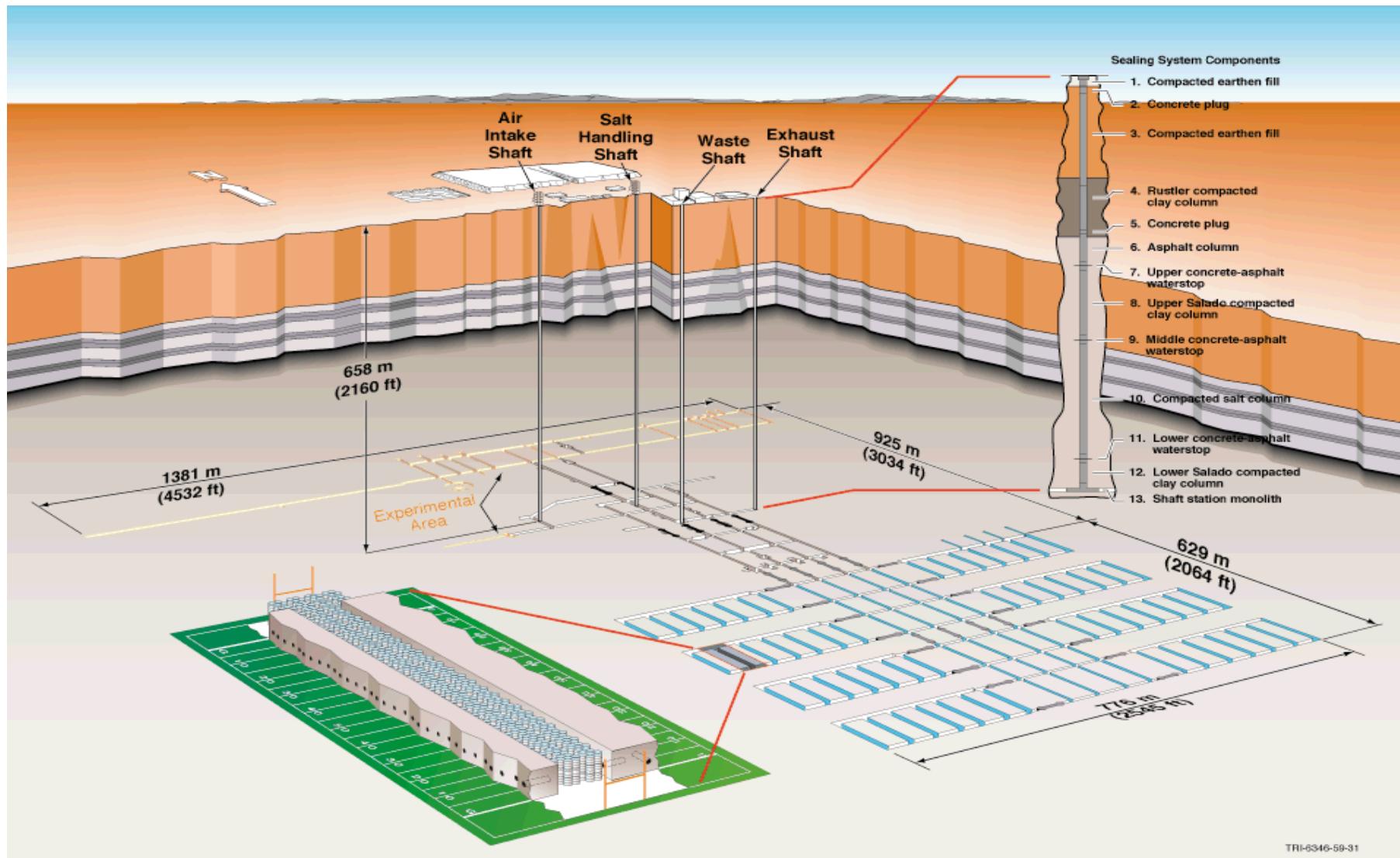
4<sup>th</sup> US/German Workshop on  
Salt Repository Research, Design and Operations

Berlin, Germany  
September 17-18, 2013

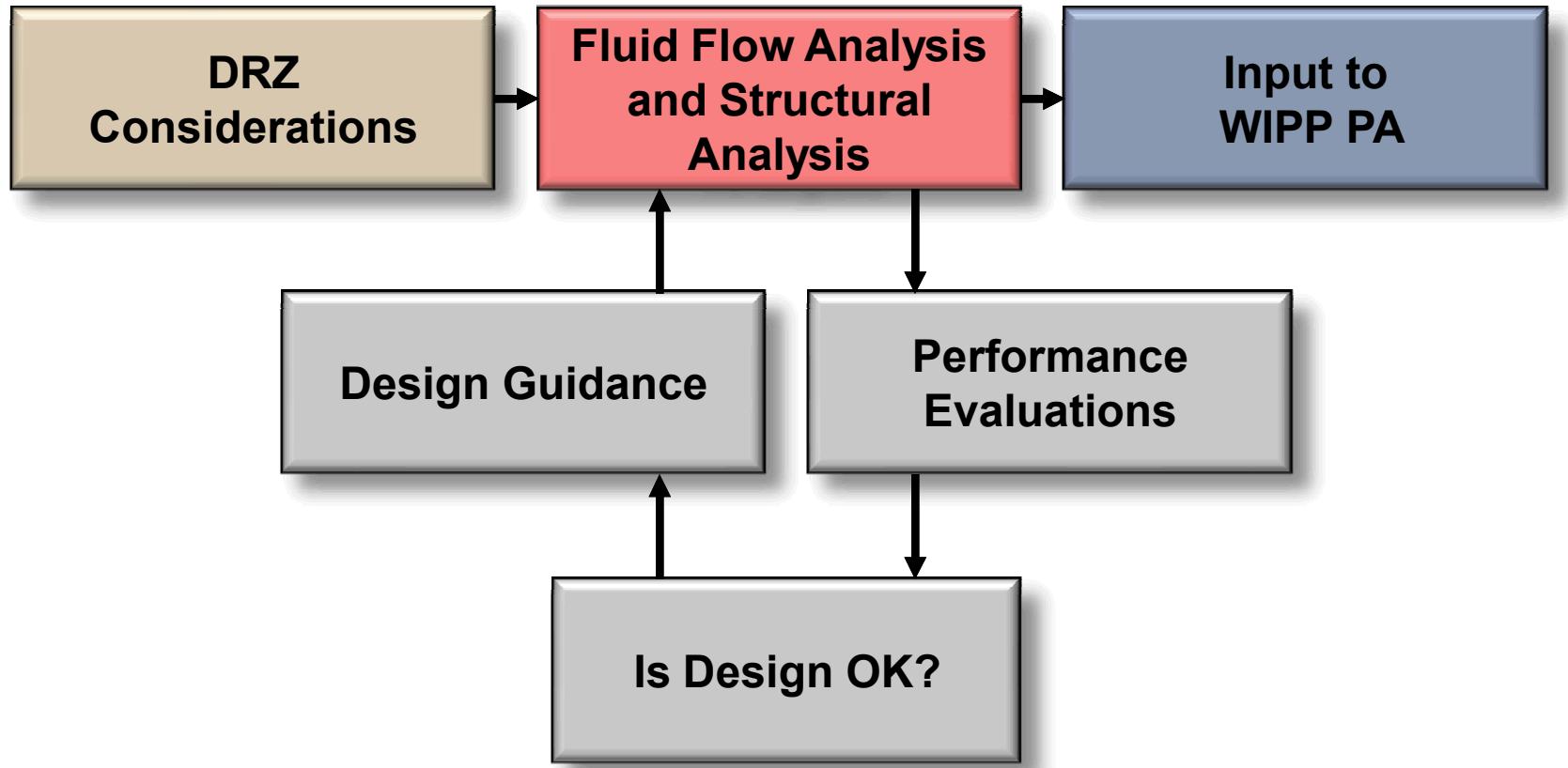


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# WIPP Facility Layout



# Shaft Seal Systems Analysis Process



# Seal Material Specification

- Functions
- Material Characteristics
- Construction
- Performance Requirements
- Verification methods
- *Summary given in Peine 2011--Salt Repository Seal Design and Materials*
- *Waste Isolation Pilot Plant Shaft Sealing System--Compliance Submittal Design Report. SAND96-1326/Two Volumes. Sandia Laboratories, Albuquerque, New Mexico USA.*

# Modeling the Shaft Seal System

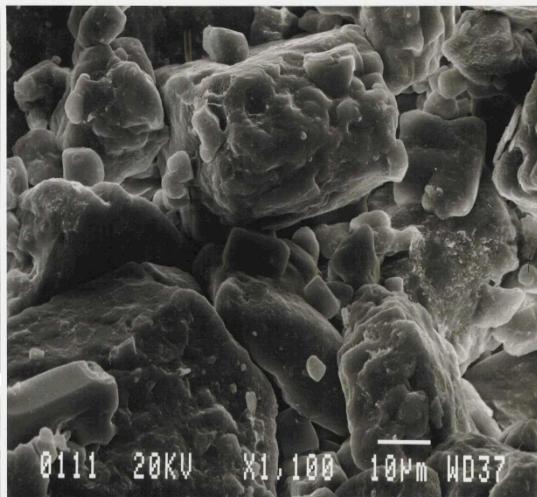
## 1 – Brine Flow Down

- Predict cumulative brine flow through the seal system down to the salt column and the repository
- Demonstrate the effectiveness seal elements

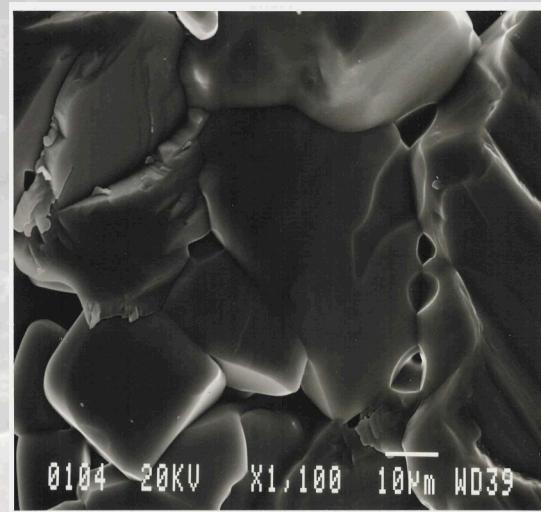
## 2 – Salt Column Performance

- Predict the intrinsic permeability of the salt column
- Demonstrate effectiveness of the salt column
- Estimate gas migration from the repository horizon

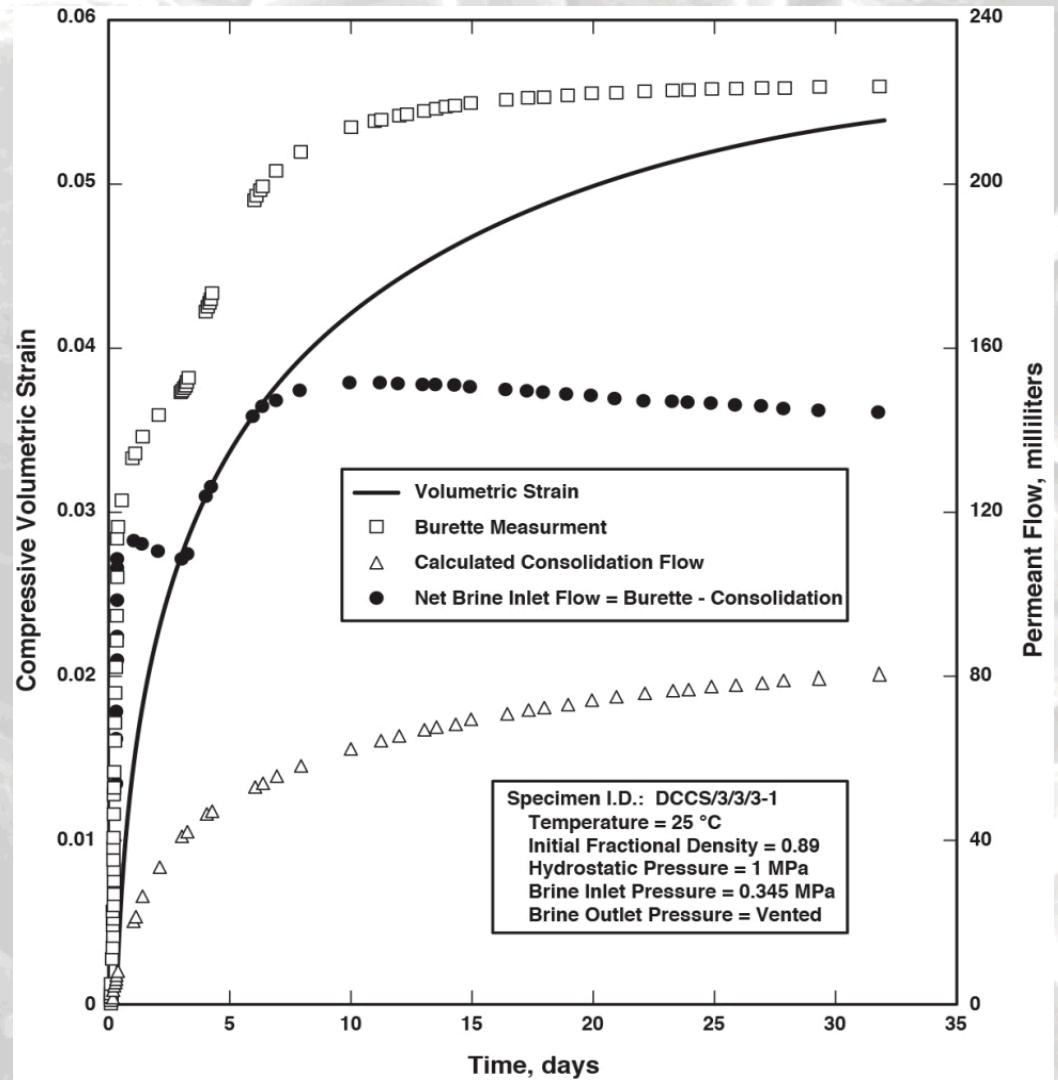
# Laboratory Results



Compacted

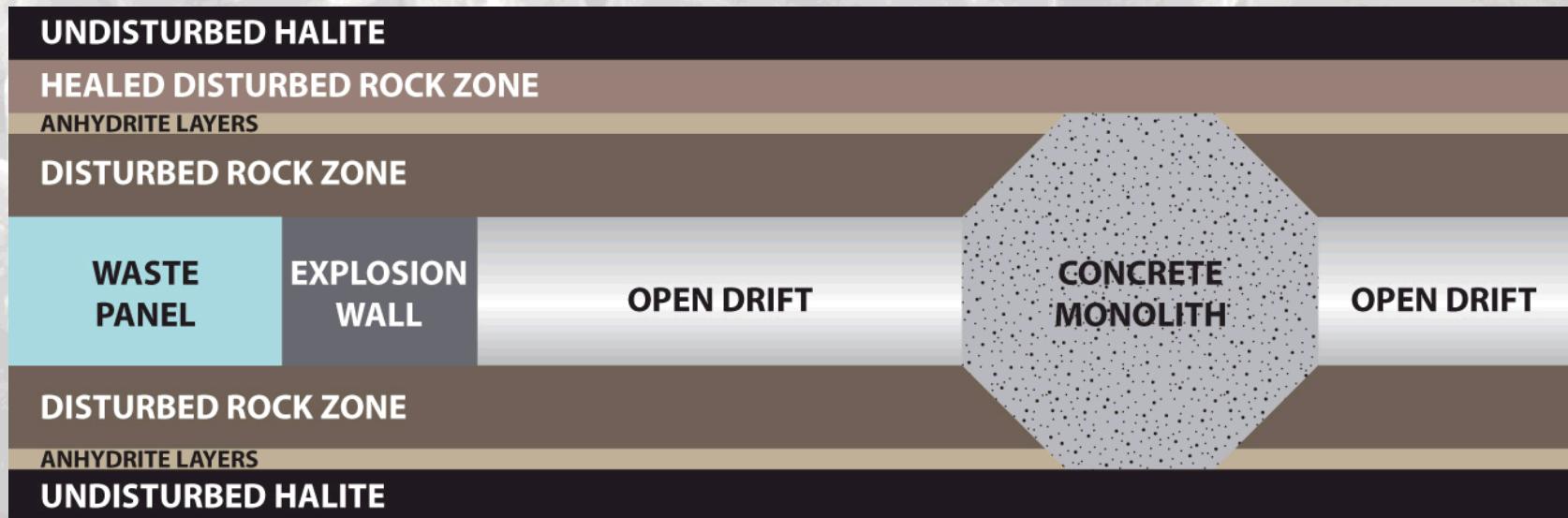


Reconsolidated

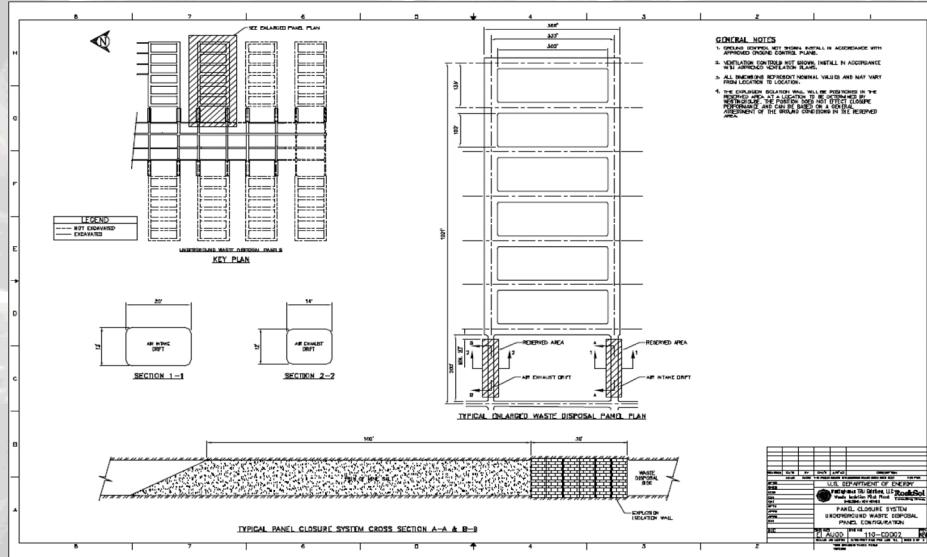


Reduction of brine permeability

# Option D Panel Closure System

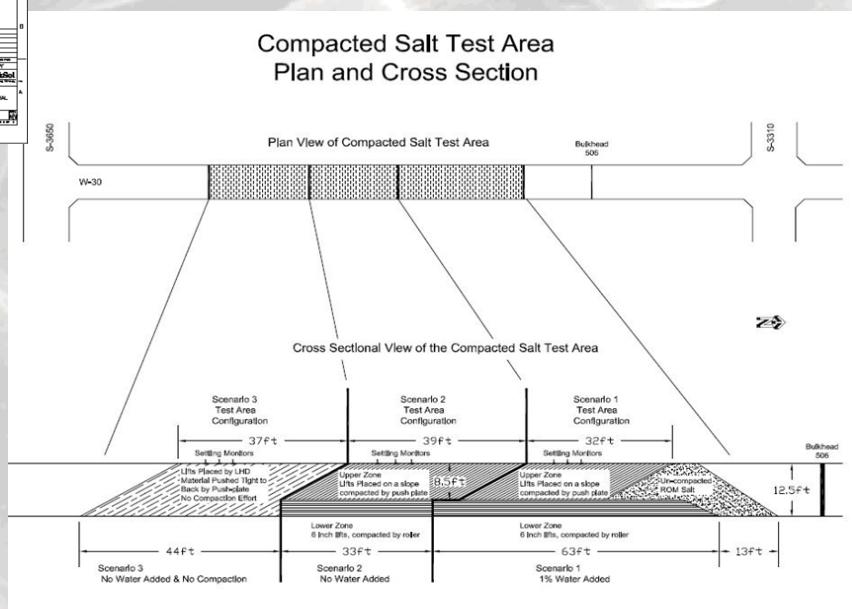


# Logical Redesign of Panel Closure



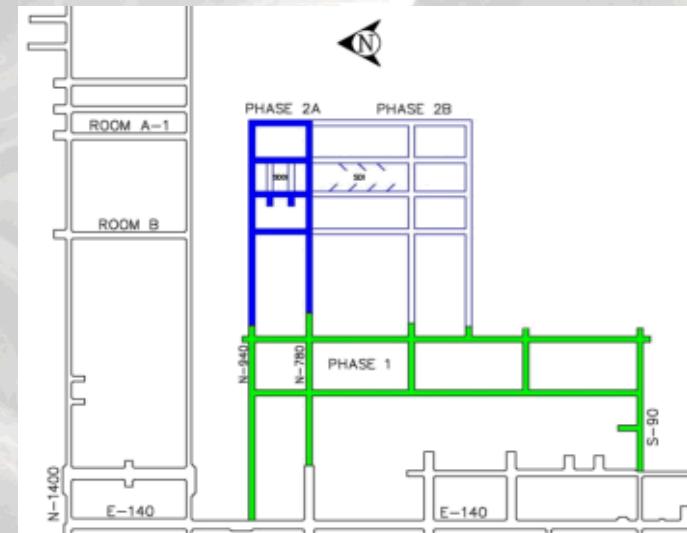
Redesign developed in 2002

## Compaction demonstration at WIPP



# Use of WIPP URL for Plugging and Sealing

- Salt Defense Disposal Investigations (SDDI)
- Salt Disposal Investigations (SDI)
- Large-Scale Seal Demonstration
- Mining Research
- Wedge Pillar Test
- Mine-By DRZ Measurement
- Single Heater Test
- In Situ Consolidation
- International Test Bed



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