

Why SDDI?

SDDI will simulate direct placement of DHLW canisters in open drifts on disposal room floors, and covered with run of mine salt for radiation shielding. This emplacement configuration, rather than boreholes, offers the possibility of vastly more efficient and flexible disposal operations, both for DHLW in some future repository and for current WIPP operations associated with TRU RH waste.

By conducting the demonstration test in a configuration that mimics the disposal of DHLW packages, the early-time evolution of the system can be studied.

The evolution of the small but non-negligible quantities of water within the salt as the heat diffuses into the surrounding geologic medium will be thoroughly investigated.

Field-scale tests and demonstrations, in conjunction with selected laboratory-scale studies and computer modeling, provide the scientific and engineering basis needed by legislators, regulators, and public stakeholders to make informed, confident decisions based on sound science.

The test results will be shared with stakeholders in support of a consent-based process.

Demonstrate DOE's inventory of waste can be safely placed in a salt repository

When Will the Test Start?

Mining is nearing completion for the SDDI test area. Sufficient funding will allow for a late 2015 start to the heating phase. Test design, procurement, instrumentation development/specification and heater system engineering are 2014 priorities. The Fiscal Year schedule below illustrates the high-level sequence of activities.

ID	Task Name	Fiscal Year																		
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020									
1	Plan and Design the SDDI Test																			
2	Mine and Construct the Test																			
3	Commit to Major Procurements/Contracts																			
4	Install and Implement the Test																			
5	Baseline and RH TRU Waste Demo																			
6	Heating Start - DHLW SDDI Test																			
7	Conduct the Test																			
8	Cool-Down																			
9	Conduct Post-Test Forensics																			

SALT DEFENSE DISPOSAL INVESTIGATIONS

A Field-Scale Thermal Test for Heat-Generating Defense Waste

What is SDDI?

The Salt Defense Disposal Investigations (SDDI) will utilize a newly mined Underground Research Lab (URL) in WIPP to perform a cost effective, proof-of-principle field test of the emplacement of heat-generating radioactive waste and validate modeling efforts.

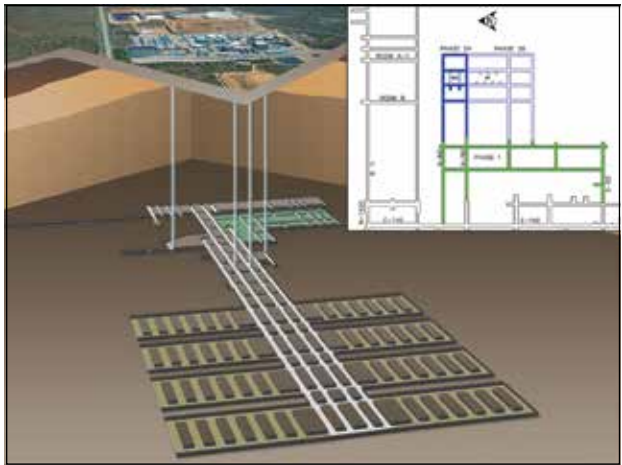
The goals of the SDDI Thermal Test are to:

- Demonstrate a proof-of-principle concept for in-drift disposal in salt.
- Investigate, in a specific emplacement concept, the response of the salt to heat.
- Develop a full-scale response for run-of-mine (ROM) salt.
- Develop a validated coupled process model for disposal of heat-generating wastes in salt.
- Evaluate the environmental conditions of the test post-facto.

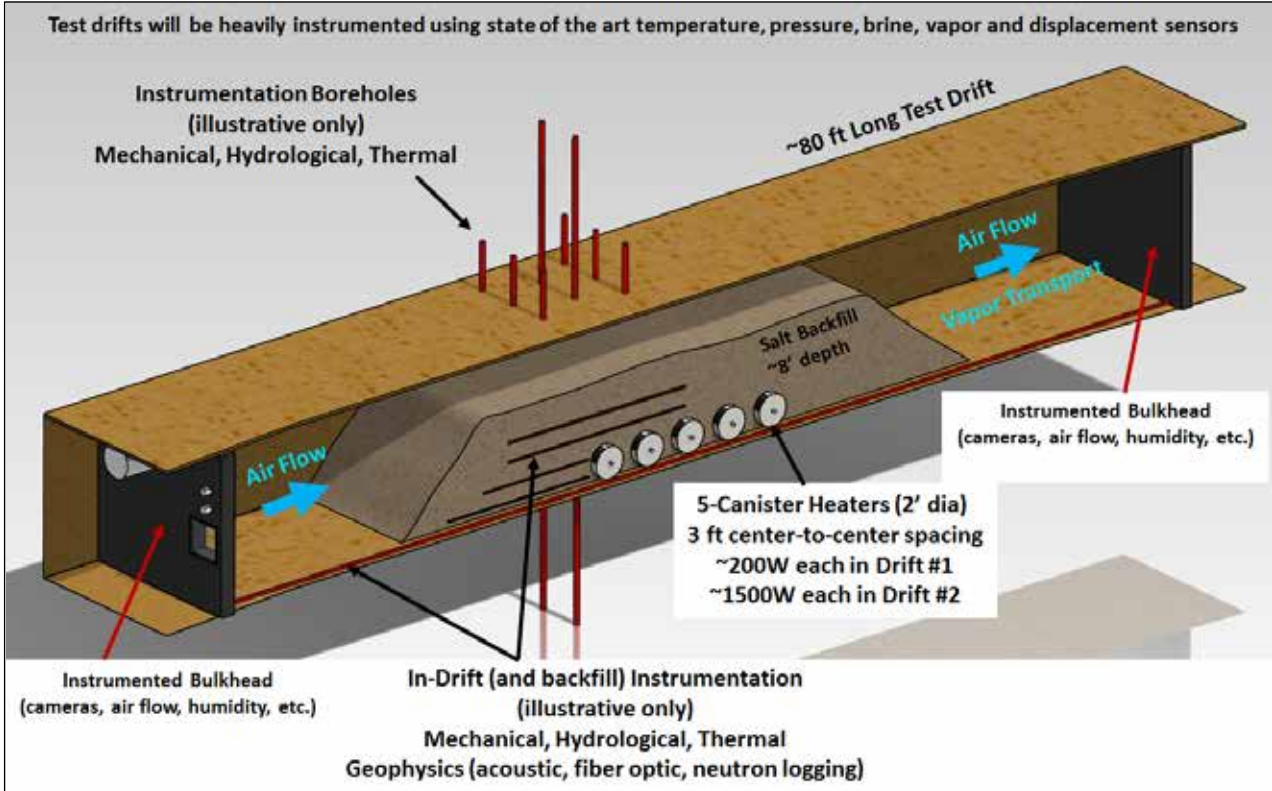
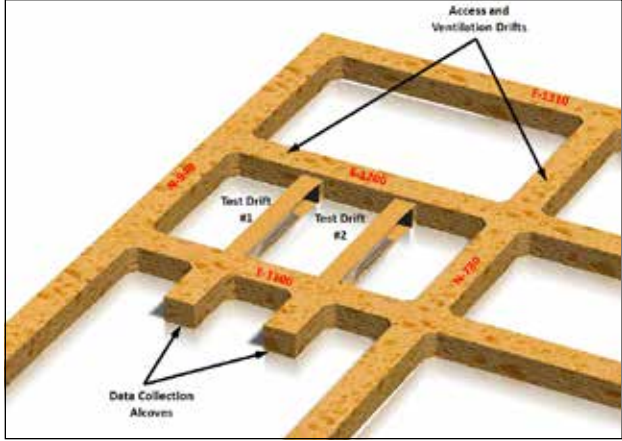


WIPP's Underground Research Laboratory (URL)

SDDI tests will be in a new URL at WIPP, mined far away from waste operations



The two test drifts will be near the north-east corner of the newly mined research area ...



The field heater tests will take place in two drifts. One drift will mimic the emplacement of typical DOE Defense High-Level Waste (DHLW) (< 200 Watts per canister). The test in the second drift will simulate emplacement of hotter wastes (1500 watts per canister) to confirm the impact of higher temperatures.

Test Specification (planned)	SDDI Test Drift	
	SDDI Drift #1	SDDI Drift #2
Drift Location	see figure 2-6	see figure 2-6
Drift Length (ft)	80	80
Drift Width (ft)	16	16
Drift Height (ft)	10	10
Number of Heater Canisters	5	5
Wattage of Each Heater (W) (nominal)	200-300	1500
Approx Average Drift Wall Temp (C)	40	75
Planned Length of Test	2 years heating	2 years heating

Pre-test modeling results using computer codes developed at LANL predict temperatures above boiling and vapor phase transport near the canister heaters for the hotter test arrangement.

