

Environmental Restoration Project



ER Site No. 117: Trenches (Bldg 9939)

ADS: 1335

Operable Unit: Southwest Test Area

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Site History

The Large Melt Facility (LMF) Building 9939/9939A complex covers approximately 2 acres. It is located west of Lovelace Road, approximately 1.6 miles north of the Solar Tower and within the 30.6-acre LMF permitted area. The LMF was used to conduct nuclear reaction experiments using molten sodium and concrete, and molten uranium and concrete. Between 220 and 440 lb of sodium was used in each of fifteen large-scale sodium-containment and structural-integrity tests from 1977 to 1981. As a part of the disposal process, wastewater from the crucible rinsing operation was disposed of in one or more of four known trenches. Some of these trenches may also have been used for disposal of scrap metal.

The residual sodium in the test crucibles used in the integrity tests was rinsed into the crucible spray trenches with a spray mist of water. Reaction products (sodium hydroxide) and excess water drained into the trenches. Each trench was filled with clean soil and its use was terminated when it had been filled with sodium-rich soil to within 5 or 6 ft of the top. The sodium may or may not have been soaked with water before the trench was filled with soil. According to SNL records, the trenches were approximately 12 ft deep, 5 ft wide, and 20 to 40 ft long. They are located approximately 300 to 400 ft northwest of Building 9939A/B.

On December 17, 1988, a reaction occurred in a fifth trench near the location of the spray trenches. A buried drum of elemental sodium exploded when it reacted with water leaking from a broken water line. There is no verification that all the sodium buried in the trench reacted, but it was documented that combusted sodium was removed from the trench. The amount of sodium involved in the incident was estimated to have been between 20 and 40 lbs. Sodium-reaction products were collected and put into barrels. The trench was then refilled with dirt and visually identified. Site personnel conducted a follow-up metal-detection survey of the area with no indication of any additional buried drums.

Available information about ER Site 117 and adjacent [Site 103](#) refers to experiments with molten uranium dioxide, magnesium oxide, and concrete, but there is no reference to the method of disposition of the uranium. There is, however, documentation of the presence of depleted uranium (DU) in the surface soils around Building 9939.

Constituents of Concern

DU

Elemental sodium (contained in drums). Because of its high reactivity properties, elemental sodium does not exist in nature.

Current Hazards

There are no current hazards at this site related to contamination of the surface or subsurface soils. There are structures and stored materials that remain at the site that are potential hazards.

Current Status of Work

The site background investigation for the RCRA Facility Investigation (RFI) is complete. The RFI work plan was completed in March 1996.

A surface radiation survey using sodium-iodide detectors for gamma radiation was conducted in March 1994. It covered 6.3 acres at 100 percent coverage. Some of the radiation anomalies found were in the general vicinity of the trench locations.

In 1995, SNL implemented Voluntary Corrective Measures (VCM) to remove the fragments and surface soil sources with elevated radiation levels. This VCM was combined with the radiological VCM for [Site 103](#).

Two geophysical surveys were conducted over the area in April and October 1997 to determine the exact number and location(s) of the sodium spray pits. The surveys covered approximately 3 acres in the vicinity of the suspected pit locations. The survey identified several significant metal anomalies including a segmented open burial trench exposed in two sections and two subsurface concentrations of buried metal.

A Voluntary Corrective Action (VCA) was conducted at the Site during 1999 and early 2000 that evaluated subsurface conditions and resulted in the removal of buried debris and other waste items. Analytical results of the soil samples collected from the five trenches completed as part of the VCA confirmed that no releases had occurred in the disposal area that posed a threat to human health or the environment.

Site 117 was proposed for a risk-based NFA in September 2000. This site was accepted for NFA by NMED on December 5, 2000. The NFA was approved by NMED on November 19, 2001, after completing the public review and permit modification process.

Future Work Planned

None.

Waste Volume Estimated/Generated

The combined Sites [103](#)/117 radiological surface soil VCM generated 47 drums of radioactive waste. The Site 117 VCA resulted in the generation of approximately 12 cubic yard of non-regulated solid waste, 2 cubic yards of RCRA-regulated hazardous waste, 3 cubic yards of radioactive waste and ½ cubic yard of mixed waste.

Information for ER Site 117 was last updated Jan 22, 2003.