

Environmental Restoration Project



ER Site No. 193: Sabotage Test Area (Thunder Range)

ADS: 1335

Operable Unit: Southwest Test Area

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Site History

The Sabotage Test Area is located near the southwestern corner of Kirtland Air Force Base (KAFB), within the triangle formed by Magazine Road, Isleta Road, and University Ranch Road. The site occupies approximately 0.6 acres in South Thunder Range and is located southwest of Building 9964, the former control bunker for the site.

The Sabotage Test Area is essentially flat, with a very slight slope to the west. The surficial geology at the site is characterized by a veneer of aeolian sediments that are underlain by alluvial fan or alluvial deposits. Based on drilling records of similar deposits at KAFB, the alluvial materials are highly heterogeneous, composed primarily of medium to fine silty sands with frequent coarse sand, gravel, and cobble lenses, and probably extend to the water table. Depth to groundwater at the site is approximately 350 feet below ground surface. Local groundwater flow is generally to the west/northwest. The nearest production well, KAFB-4, is located approximately 5.5 miles to the north of the site. The nearest groundwater monitor well is TRE-1, which is located approximately 1,400 feet east of the site.

Building 9964 was constructed in 1967 as a control bunker for the 2-foot shock tube and the Beryllium Firing Site. Test activities not associated with ER Site 193 were investigated as part of the [ER Site 17](#) (Scrapyards) and [ER Site 90](#) (Beryllium Firing Site) investigations in OU 1335. The three types of tests conducted at the Sabotage Test Area are described below. The test site is no longer active.

Minimum Attack Time Tests

In the mid- to late 1970s, studies were conducted to determine how effective different types of

attacks might be on storage structures similar to those used to store nuclear weapons. High explosives (HE) charges and various types of equipment were evaluated. The primary purpose of the tests was to determine how quickly hostile personnel could penetrate the buildings, which were built of reinforced concrete, and gain access to controlled materials. The tests involving equipment use did not generate any hazardous residues. The high explosive (HE) tests used different types of shaped and tamped explosive charges in the 50 pound range or smaller. All of the explosives burned completely during the tests or were removed according to personnel conducting the tests. A Department of Defense (DoD) study on explosives shows that explosive tests involving less than 2,000 pounds of HE do not produce any unexploded residues if the HE successfully detonates (goes "high order"). Based on interviews and site records, all HE was completely consumed during the tests, therefore, no sampling for residual HE was conducted at the site.

The explosives used in the Minimum Attack Time tests varied, but mostly consisted of 2,4,6-trinitrotoluene (TNT), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), and possibly octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) compounds.

Shipping Cask Tests

Tests were conducted from 1979 to 1981 to determine how much radioactive material would be released from a terrorist attack on a nuclear fuel rod shipping cask. Three tests were conducted at ER Site 193. In the first two tests, a shaped charge including 30 to 40 pounds of HE was detonated against a simulated fuel cask with simulated fuel rods. Both tests were open air tests, and materials including depleted uranium (DU), zirconium, lead, and stainless steel were dispersed across the site. A third test was conducted in a chamber (3 meters in diameter by 6 meters long) that fully contained the assembly and all the resulting debris. In this test, a full-scale shipping cask and simulated fuel rods were subjected to an explosive charge to assess the potential damage from a terrorist attack. The simulated fuel assembly consisted of 258 kilograms of DU in zircalloy tubing, 1.2 meters in length. Materials dispersed within the chamber included DU, zirconium, lead, and stainless steel.

Storage Cask Test

A test was conducted in approximately 1981 to study how much radioactive material would be released from a terrorist attack on a nuclear fuel rod storage cask. This test was conducted in a steel box that measured approximately 8 feet by 10 feet with one open side. A dry storage cask with steel walls, containing fuel elements simulated by DU (reportedly about 12 kilograms), was subjected to a detonation from a shaped charge. Five of the nine simulated cells within the storage cask were penetrated during the tests, and about 100 grams of uranium oxide (UO₂) were not recovered after the test. The DU and other metals, which were fragmented and vaporized during the test, were dispersed inside the steel box and to the west out of the open side of the box.

Constituents of Concern

DU
Lead

Current Hazards

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

Current Status of Work

A surface radiation survey conducted in 1994 detected elevated radiation levels in the soil surrounding the test chamber. A voluntary corrective measure (VCM) was conducted in 1995 to remove contaminated soils. Site characterization sampling is complete. A proposal for no further action (NFA) was submitted to New Mexico Environment Department (NMED) in August 1997. In December 1999, following review of SNLs response to a Request for Supplemental Information (RSI), NMED indicated that the site was acceptable for NFA. The NFA was approved by NMED in July 2000 after completing the public review and permit modification process.

Future Work Planned

No further work is planned.

Waste Volume Estimated/Generated

Eight drums of radioactive waste were generated at this site.

Information for ER Site 193 was last updated Jan 22, 2003.