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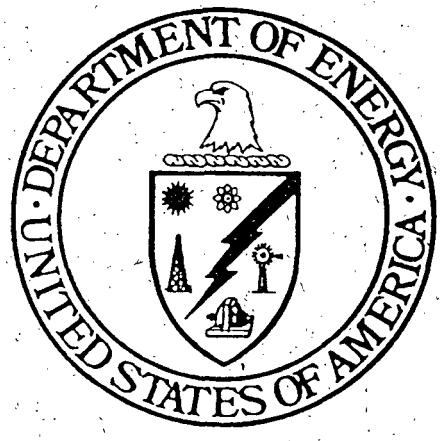
FEBRUARY 24, 1992

BY
SANDIA NATIONAL LABORATORIES
Albuquerque, New Mexico

FOR THE
DEPARTMENT OF ENERGY
Albuquerque Field Office
Albuquerque, New Mexico



SANDIA-ENVIR-6

SANDIA NATIONAL LABORATORIES, TONOPAH TEST RANGE
ENVIRONMENTAL MONITORING PLAN

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FOREWORD

This Environmental Monitoring Plan applies to the U.S. Department of Energy's (DOE's) operations on the Tonopah Test Range (TTR) Nevada, conducted by Sandia National Laboratories (SNL) under the purview of the DOE Albuquerque Field Office (AL). The primary purpose of these operations is to conduct a nuclear ordnance delivery system testing program for the DOE and the Department of Defense. These tests have been conducted at the TTR, approximately 140 miles northwest of Las Vegas, Nevada, since 1957. In accordance with DOE Order 5400.1, this Environmental Monitoring Plan consolidates into one document descriptions of the environmental monitoring activities conducted at the TTR for protection of the environment. These monitoring activities are conducted in accordance with the stated SNL policy to conduct operations with the highest regard for the protection and preservation of the environment and human health.

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The TTR lies between two Great Basin mountain ranges, the Cactus Range (west) and the Kawich Range (east). The valley is typical of the high desert of the Basin and Range Province. The north-south axis of the valley, known as Cactus Flat, consists of a string of playas at an elevation of approximately 5300 feet above mean sea level. As a closed basin, surface runoff following precipitation events flows toward the playas, with no discharge to off-TTR areas. There are no surface water streams, or natural impoundments on the TTR. Depth to groundwater ranges from 90 to 150 feet. There are two springs located in the Cactus Mountain Range and one in the Kawich Mountain Range (Exhibit 1-2). The lower valley slopes are sparsely vegetated with grasses and low brush, such as budsage and shadscale. Higher mountain slopes support larger bushes, Joshua trees, and pinyon-juniper forest (ERDA, 1975).

The predominantly clear-sky climate of the area is favorable for year-round operations. Temperature records for the site range from -24 to 102°F. Precipitation averages approximately five inches per year in the valley, with the majority occurring as a result of summer thunderstorms (ERDA, 1975). Predominate wind directions are from the south in winter, and west northwest in summer, as depicted in the wind rose data provided in Exhibit 1-3.

1.1.2 Facilities

Areas 3 and 9 are the two primary centers of activity at the TTR (Figure 1-2). The Area 3 (Operations Center) work area compound has over 20 buildings and is located near a 6000-foot airstrip. This area is the principal administrative, operational control, and support center for the TTR. Office buildings, vehicle and equipment repair shops, craft shops, and other operational support buildings are located here.

Facilities at Area 9 consist of four large buildings, three blockhouses, and numerous explosives storage units, all of which are used in support of the Area 9 rocket launching and gun firing facility. The facility includes four rocket launchers, two gun barrel mounts, three camera and telemetry antennas, and one 300-foot meteorological tower.

The main road from the Main Gate to the Operations Center is paved; several others have been oiled for dust control. Other roads have been graded and are frequently maintained. There are many unmaintained, primitive roads, established during World War II, that are rarely traveled.

Approximately 12 air-drop ordnance targets are in use on the TTR. The targets, most of which are hard earth targets, lie on or near the series of playas extending for about 13 miles between Main Lake, at the north, to Antelope Lake, at the south. The over-flight line for the drop tests parallels the line of targets and centers on the Main Lake target. Eight of the targets are shown in Exhibit 1-2.

Facilities on the TTR include numerous tracking stations at various distances on either side of the flight line. These sites are designed to support various instruments, including telescopes, phototheodolites (contraves), radars, and telemetry. Development at each site ranges from sophisticated concrete and steel towers or pads, to cleared areas for portable telescope use. Six antenna arrays are also located around the periphery of the Range.

The NEDS (Nonviolent Explosives Destruct System) site is located in the center of a small dry lake six miles south of Main Lake. Testing at this location is observed through several bunkered camera and instrument stations nearby. Tests are controlled from a partially buried instrumentation and control bunker.

The C4 (Trident) site, a rocket static test pad with a removable building over it, is situated on the east side of the Range near Cedar Pass Road. This area also includes several instrument and camera bunkers, a bunkered power plant, and a converted World War II control bunker. This site has never been used.

Other facilities at the TTR include a weather station balloon building and a phototheodolite maintenance building, both near Main Lake.

1.2 TEST ACTIVITIES

The Las Vegas Army Air Gunnery School was established in 1941 (at the present Nellis Air Force Base), and during the 1940s the TTR was part of an area used both for gunnery training and as a bombing range by the U.S. Army Air Corps. Subsequently, the TTR was established in 1957 for field testing of conventional and nuclear weapons, research rockets, and artillery. A wide variety of testing is currently conducted on various parts of the Range. These activities and the areas at which they are conducted are described below.

Test activities at the TTR consist of eight types:

1.2.1 Air Drops

The tracking systems of the TTR are configured to cover the trajectories of simulated weapon projectiles aimed at several targets on or near the dry lakes along the center of the valley. An average of 130 air drops are conducted each year, with 30 to 35 of these weapons containing high explosives (HE) or beryllium. A few deliveries (less than ten per year) are conducted at supersonic speeds; however, most deliveries are subsonic.

1.2.2 Gun Firings

Approximately 150 gun firings (155-mm and 8-inch) are conducted at the TTR each year. Less than 10 of these events employ projectiles containing radioactive or toxic materials (depleted uranium, plutonium, or beryllium), or HE. Firings are conducted such that

emissions). Therefore, none of the boilers on the TTR are subject to monitoring or require emission control equipment. However, as required by DOE Order 5400.1, the air emissions from these sources will be estimated.

2.2 LIQUID DISCHARGES

2.2.1 Sewage Lagoon

There is no discharge from the lagoon to the surface water drainage system of the TTR. However, a breach or overflow would allow a discharge to the land surface which could affect the slopes of the TTP. In Nevada, this constitutes a discharge to the waters of the

Industrial areas that may apply to the TTR include hazardous waste storage areas; landfills that receive industrial wastes; recycling facilities, including metal scrapyards, battery reclaimers, and salvage yards; vehicle maintenance, equipment cleaning, and petroleum bulk stations; treatment works including sewage treatment systems; and construction activity causing disturbance of five acres or greater of land.

Nevada has an authorized NPDES program, and the State will issue general permits to cover the majority of stormwater discharges associated with industrial activity. When an applicable general permit has been issued, the general permit will establish a date by which dischargers must submit a notice of intent to be covered by the general permit (40 CFR 122.26 (e)).

Applications for an individual facility-specific permit probably is not necessary for the TTR. The need for such an application, or an application to be covered in a group permit, will be known after the general permits are issued. This approach is part of a court decision to allow the EPA (and states) to use certain administrative devices, such as area permits or general permits to help manage the workload. [*NRDC v. Train,* 396 F. Supp. 1393 (D.D.C. 1975) aff'd, *NRDC v. Castle,* 568 F. 2d 1369 (D.C. Cir. 1977)]

The permit, once granted, may (or will) require storm water sampling and analysis for specified analyses at specified concentration levels. It may be possible to preselect sampling sites by virtue of the flood control levees and diversion ditches required by the permit. The sampling schedule will depend on the frequency of rain and occurrence of runoff.

2.2.4 Underground Storage Tanks

There are six underground storage tanks (USTs) in support of SNL operations on the TTR which are used for the storage of diesel fuel and gasoline. The locations of these tanks are shown in Exhibit 2-3. All six tanks are registered with the State of Nevada, Division of Environmental Protection, which, in 1989, adopted the Federal regulations 40 CFR 280 - 281 of RCRA into the NRS 459.800 through 459.856, Storage Tanks (Hwang, et al. 1990). Based on the age of the tanks, these regulations require monitoring for detection of leaks or releases of product from the tanks and piping systems over a five-year implementation time table.

Performance standards for USTs are listed in 40 CFR 280.20 and 280.21. These deal primarily with materials of construction, such as noncorrosive fiberglass and cathodic protection systems for steel tanks. Owners of tanks that meet these performance standards may use monthly inventory control measures and tank tightness testing at least every five years until December 22, 1998, or until ten years after the tank is installed or upgraded, whichever is later (40 CFR 280.41). For tanks that do not meet the performance standards, owners may use monthly inventory controls and annual tightness testing until December 22, 1998, when the tank must be upgraded or permanently closed. Methods of release detection

used after December 22, 1990 must be able to detect the specified leakage rate with a probability of 95 percent and a probability of false positive of 5 percent.

SNL's underground fuel storage tanks at the TTR are listed in Exhibit 2-7. The dates that release detection programs must be in place, depend on the age of the tank, and are also listed in Exhibit 2-7.

Exhibit 2-7. Underground Storage Tanks at the TTR

Tank I.D. Number	Capacity (gallons)	Contents	Year Installed	Release Detection Date
0359-1	10,000	Unleaded Gasoline	1983	1993
0359-2	10,000	Unleaded Gasoline	1983	1993
0359-3	10,000	Diesel	1983	1993
0359-4	10,000	Diesel	1983	1993
0958-1	1,000	Diesel	1966	1990
0963-1	110	Diesel	1986	1993

Product inventory control (40 CFR 280.43) must be conducted monthly and be capable of detecting at least 1.0 percent of the flowthrough plus 130 gallons on a monthly basis. Tank tightness testing must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank.

Monthly inventory control is accomplished through careful recordkeeping of inputs, withdrawals, and the amount still remaining in the tank each operating day. No routine effluent monitoring is planned for this activity beyond that prescribed in specific plans for cleanup of spills or leaks, should that occur. This activity will not be considered further in Sections 3.0 and 4.0 of this Environmental Monitoring Plan.

2.2.5 Above-ground Storage Tanks

The Federal Water Pollution Control Act regulations in 40 CFR 112, Oil Pollution Prevention (non-transportation related) apply to any facility which stores more than 1320 gallons or any container with a capacity greater than 660 gallons; thus, they apply to the six USAF above-ground fuel storage tanks. Under a Nevada state-administered program, a potential to spill into "navigable waters of the United States" becomes a potential to spill into "waters of the state," which is more restrictive since it includes dry lakes (playas). The

fuel storage facility at the TTR requires a Spill Prevention Control and Countermeasures (SPCC) Plan which must be reviewed and certified by a Registered Professional Engineer for 'good engineering practices.' Such a plan was completed in 1990 for the TTR. It identified 29 locations that needed secondary containment upgrades. Operation in compliance with the approved SPCC Plan satisfies the water quality laws of the State. Therefore, no routine effluent monitoring is planned for these sites.

2.3 SOLID WASTES/RESIDUAL CONTAMINATION

2.3.1 Sanitary Landfill

The DOE/NV holds a written authorization to operate a Class I sanitary landfill in Area 10 of the TTR (Exhibits 1-5 and 2-4). As stated in the TTR Class I Sanitary Landfill Operation and Maintenance Plan, the authorization is valid "only under the conditions of full compliance with all applicable Federal, State, and local regulations and requirements." Basically, these regulations forbid placing hazardous and toxic materials in a landfill unless the disposal facility is operated under a permit as required by RCRA. Currently, effluent monitoring is required beyond control monitoring of wastes placed in the landfill. However, on October 9, 1991, the EPA published the RCRA Subtitle D, Solid Waste Disposal Facility Criteria Final Rule in the Federal Register (56 FR 50978-51119). Regulations for new or operating landfills go into effect on October 9, 1993. The State will revise its regulations and must have them approved by the EPA before that date. EPA allows states flexibility in the design, monitoring, and closure standards which comply with the intent of the rule.

Until monitoring is required, no routine monitoring is planned for this activity. This activity will not be considered further in Sections 3.0 and 4.0 of this Environmental Monitoring Plan; however, future revisions of this Plan may be needed to accommodate the new rule.

2.3.2 Environmental Restoration Sites

Fifteen locations on the TTR considered to be potential contamination release sites were identified in two preliminary assessments (PA) submitted by DOE/AL and DOE/NV to the EPA on April 14, 1988. These sites are listed in Exhibit 2-8.

A review of the TTR PAs by Ecology and Environment (1989) included a scoring of all sites according to the EPA Hazard Ranking System (HRS) and resulted in the EPA recommendation, "no further remedial action planned." However, the revised HRS scoring procedure published by EPA by 1990 requires the inclusion of TTR workers as a target population, and there is a possibility that the TTR score might be high enough for the TTR to be included on the National Priorities List (NPL). Remedial action could then be indicated.