INFORMATION SHEET: 260 OUTFALL

ER2002-0333

TA-16-260

1940s The Laboratory was founded in 1943 as part of the Manhattan Project. Processes used to carry out the Laboratory's past and present missions involve the use of hazardous and radioactive materials.

1950s During and after World War II, materials were disposed of on the Laboratory site or otherwise released into the environment.

1960s Congress enacted basic legislation to protect the environment. The DOE's predecessor, the Atomic Energy Commission, and the Laboratory began to conduct surveys and to clean up areas where spills and disposal had occurred.

1970s Congress enacted the Resource Conservation and Recovery Act (RCRA) that governs the day-to-day operations of hazardous waste generation, treatment, storage, and disposal facilities (sites).

1980s Congress amended RCRA by passing the Hazardous and Solid Waste Amendments (HSWA). HSWA prescribes a corrective action process that focuses primarily on the investigation and cleanup, if required, of inactive sites.

1989 Environmental restoration began at the Laboratory to clean up sites that were formerly involved in weapons research and production.

1990s Present The ER Project investigates and cleans up sites that have the potential to affect human health or the environment, in accordance with the Laboratory's RCRA permit.

LOS ALAMOS NATIONAL LABORATORY

Los Alamos National Laboratory (the Laboratory) is a multidisciplinary research facility owned by the Department of Energy (DOE) and managed by the University of California. The Laboratory is located in north-central New Mexico approximately 20 miles northwest of Santa Fe. The Laboratory covers 43 square miles of the Pajarito Plateau; the Plateau consists of a series of finger-like mesas that are separated by deep canyons containing perennial and intermittent streams running from west to east.

RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP ENVIRONMENTAL RESTORATION PROJECT

The Laboratory's Environmental Restoration (ER) Project (implemented by the Risk Reduction and Environmental Stewardship [RRES] Division) is a part of a DOE nationwide program. DOE's environmental restoration efforts began in 1989. The ER Project investigates whether hazardous chemicals and/or radioactive wastes are present as a result of past Laboratory operations and cleans up and restores such sites as needed.

260 OUTFALL DESCRIPTION

Building 16-260 was the Laboratory's conventional high explosive (HE) machining facility during much of the Cold War. From 1951 to 1996, 13 sumps discharged HE-contaminated wastewater through the 16-260 outfall. Potential Release Site (PRS) 16-021(c)-99 includes the sumps and drain lines that lead to the outfall, as well as the outfall itself, a pond, and a drainage channel. During the RCRA Facility Investigation (RFI) process, personnel determined that nearby soils, springs, seeps, Cañon de Valle, other surface waters, and groundwater were contaminated with high explosive materials. Cañon de Valle is a nesting area for the Mexican spotted owl. PRS 16-021(c)-99 is the Laboratory's first corrective measures study/corrective measures implementation (CMS/CMI) project.

SAMPLING AND CONTAMINANTS OF CONCERN

The primary contaminants of concern include the high explosive compounds RDX, HMX, and TNT and the metal barium. Sampling in the TA-16-260 outfall in 1995 revealed HE levels in soil as high as 20 weight percent and barium levels over 3 weight percent. Barium is present at the site because the compound barium nitrate was used to make the Manhattan Project-vintage explosive baratol. Sediments in Cañon de Valle are also contaminated due to discharges from the 260 outfall; the sediment contaminant of greatest concern is barium. Sampling of springs, surface waters, alluvial waters, and perched groundwaters have revealed high levels of HE and barium in those media. The highest HE levels in water were found in the surface water in Cañon de Valle. The highest barium levels in water are in the alluvial water in Cañon de Valle. Several explosives were also found in deep groundwater samples from the nearby R-25 well. Both RDX and TNT levels are greater than EPA health advisory levels, and barium exceeds New Mexico Water Quality Control Commission (WQCC) levels in most of these water media.

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Excavation of contaminated soil

Robotic blending/excavation

Site restoration

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

Contact the Communications & Outreach Team

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CLEANUP

Over 1500 cubic yards of the most highly contaminated sediments were cleaned up in 2000 and 2001 in an Interim Measure (IM). The majority of the total contaminant mass in the outfall area was removed. Much of this cleanup was done remotely, due to concerns with detonation because of the high levels of HE in the soils in the outfall area. RDX levels in the outfall area were generally less than 100 ppm following this IM, and total HE levels were less that 0.1 weight percent after cleanup.

The Laboratory deployed a pilot-scale Stormwater Management System barrier unit in 2001. This small filter system is designed to remove HE and barium from water in Martin Spring, a small spring in Cañon de Valle downstream from the 260 Outfall. Preliminary results suggest that the unit is effectively removing HE, but not barium.

OTHER ACCOMPLISHMENTS & ONGOING ACTIVITIES

Representatives of the Laboratory, New Mexico Environment Department (NMED), and the DOE have been working on the TA-16-260 outfall CMS together as members of a high performance team (HPT). This team will streamline the corrective action process by minimizing paperwork requirements and maximizing cleanup activities. Specifically, the HPT will evaluate cleanup technologies to implement at various locales at TA-16, define points of compliance, finalize human health and ecological risk assessments, set risk-based cleanup levels, and develop a long-term monitoring strategy.

Two deep wells, CdV-R-15-3 and CdV-R-37-2, were drilled east and southeast of the TA-16-260 outfall and the R-25 well during 2000 and 2001. These wells were installed to determine whether the HE detected in the R-25 well was moving away from TA-16. Quarterly sampling results in these wells have not detected HE. Springs, surface waters, wells, and other waters at TA-16 are sampled quarterly to evaluate whether contaminant levels are decreasing due to natural processes. Sampling data also helps to define points of compliance for the CMS, to refine the hydrogeologic conceptual model, to evaluate contaminant pathways, to support risk assessments, and to determine optimum monitoring locations.

The TA-16-260 outfall CMS represents the pilot test for full-scale ecological risk assessments in the Laboratory's cleanup projects. Cañon de Valle and the TA-16-260 outfall failed the initial ecological screening assessment. Working through the HPT, a strategy emphasizing sampling of biota, including both aquatic invertebrates and rodents, and toxicological testing is being implemented to support the TA-16-260 CMS.

A number of technologies and cleanup methods are being evaluated in the CMS. These include: HE composting, a zero-valent iron technology, barrier technologies, in-situ stabilization, and monitoring of natural degradation processes. The Laboratory is also working with the Pantex Plant through the Innovative Treatment Remediation Demonstration (ITRD) program to evaluate in-situ treatment technologies for groundwater.