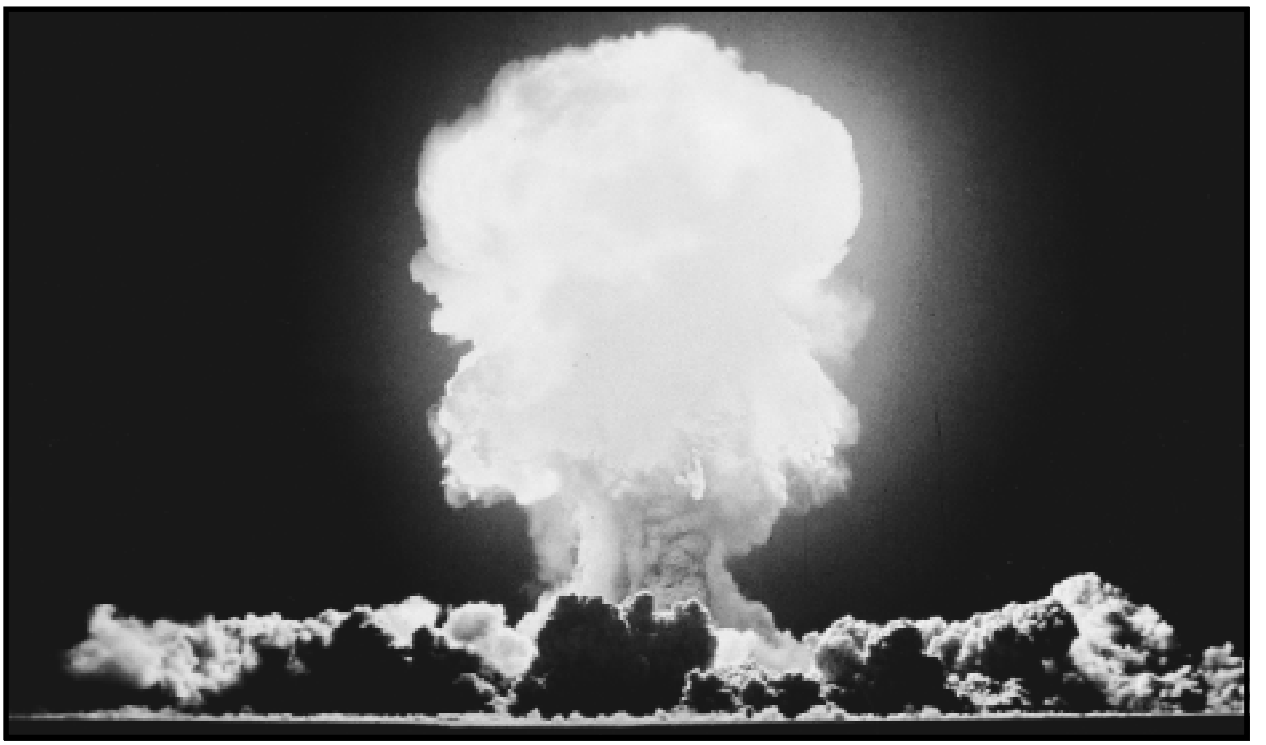
Linking Legacies



Fizeau. This 11-kiloton atmospheric nuclear explosion, code-named "Fizeau," was one of 210 atmospheric nuclear tests conducted by the United States. Of the 1,054 nuclear tests explosions conducted by the U.S., 904 were detonated at the Nevada Test Site. All U.S. nuclear explosions since 1962 have been underground. *Event Fizeau, Operation Plumbbob, Yucca Flat, Nevada Test Site, Nevada. 9:45 A.M., September 14, 1957.*

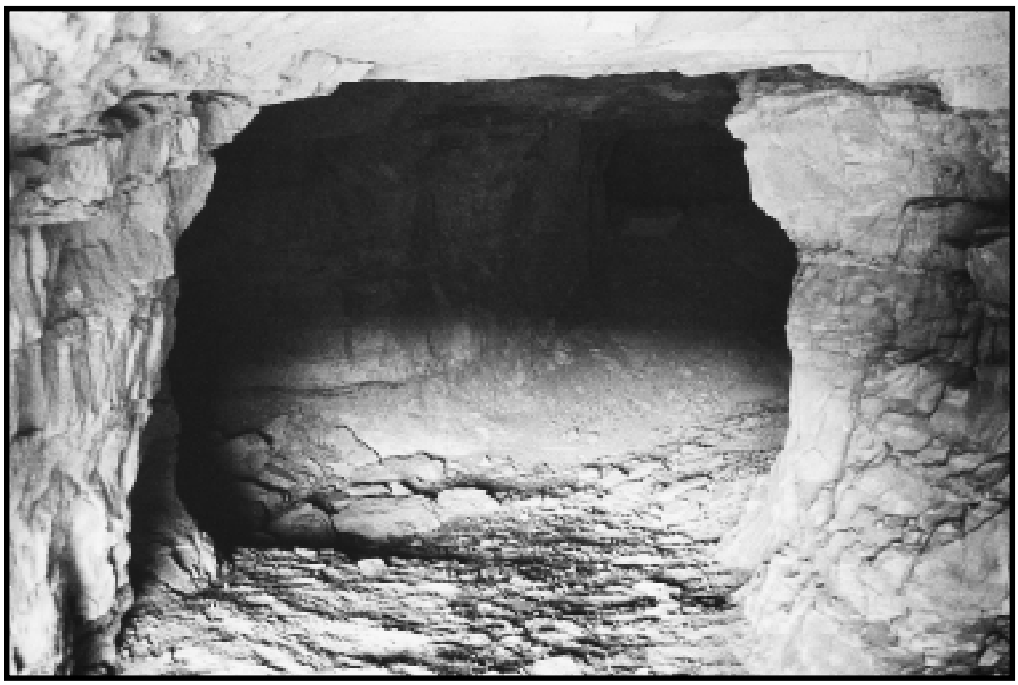
Barrels of transuranic waste sit on a concrete pad in temporary storage. This waste is contaminated with traces of plutonium. More than 300,000 barrels of such waste from nuclear weapons production are buried or stored around the country. Cleanup efforts throughout the weapons complex will add to the volume of this waste. *Transuranic Waste Storage Pads, E Area Burial Grounds, Savannah River Site, South Carolina. January 7, 1994.*

Linking Legacies

Connecting the Cold War Nuclear Weapons Production Processes to Their Environmental Consequences

January 1997

The U.S. Department of Energy
Office of Environmental Management



Underground uranium mine near Grants, New Mexico. Prospectors discovered rich deposits of uranium in the area in 1950, initiating 40 years of mining activity in the region. *Grants, New Mexico. August 19, 1982.*

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A remote monitoring camera inside the Defense Waste Processing Facility allows workers to monitor operations in the world's largest high-level nuclear waste processing facility. This facility fills canisters with high-level nuclear waste solidified in glass. The waste was generated by reprocessing operations, which extracted plutonium for use in nuclear weapons. The waste-filled canisters are stored awaiting the availability of a geologic repository for permanent disposal. *Savannah River Site, South Carolina. June 15, 1993.*

INTRODUCTION

In the aftermath of the Cold War, the United States has begun addressing the environmental consequences of five decades of nuclear weapons production. In support of this effort, the National Defense Authorization Act for Fiscal Year 1995 directed the Department of Energy (DOE) to describe the waste streams generated during each step in the production of nuclear weapons.

Accordingly, this report responds to this mandate, and it is the Department's first comprehensive analysis of the sources of waste and contamination generated by the production of nuclear weapons. The report also contains information on the missions and functions of nuclear weapons facilities, on the inventories of waste and materials remaining at these facilities, as well as on the extent and characteristics of contamination in and around these facilities.

Other DOE reports have provided much of this information separately, but this analysis unites specific environmental impacts of nuclear weapons production with particular production processes. The Department used historical records to connect nuclear weapons production processes with emerging data on waste and contamination. In this way, two of the Department's "legacies"—nuclear weapons manufacturing and environmental management—have become systematically "linked."

In reality, the two legacies were never separate. The secrecy surrounding nuclear weapons made a disconnect between the two seem natural. However, the greater openness within the nuclear weapons complex now makes this new linkage possible, even necessary.

By connecting the Department's inventories of nuclear weapons materials, waste, surplus facilities, and contamination with the processes that generated them, and describing their present status, *Linking Legacies* quantifies the current environmental results of past activities. The goal of this report is to provide Congress, DOE program managers, non-governmental analysts, and the public with an explicit picture of the environmental results of each step in the nuclear weapons production and disposition cycle. This new knowledge from the past can serve as a guide for the future, influencing ongoing activities like waste minimization and pollution prevention and control.

This new knowledge may also encourage us to address two questions during our planning and program implementation: What could we have done differently in the past that would have lightened our burden today? What should we be doing now that can most effectively avoid further environmental problems in the days to come?

Glovebox for handling plutonium is a sealed environment kept under negative pressure and, when necessary, filled with inert gas to keep the plutonium inside from igniting in air. Safety procedures require workers to wear anti-contamination clothing and to handle plutonium through rubber gloves attached to the wall of the box. *Plutonium Finishing Plant, Hanford Site, Washington. December 17, 1993.*