U.S. DEPARTMENT OF ENERGY | Legacy Management

Fact Sheet

CERCLA/RCRA

# Rocky Flats, Colorado, Site

*This fact sheet provides information about the Rocky Flats, Colorado, Site. This site is managed by the U.S. Department of Energy Office of Legacy Management under the Comprehensive Environmental Response, Compensation, and Liability Act and Resource Conservation and Recovery Act.*

## Site Description and History

The Rocky Flats Plant was part of the nationwide nuclear weapons complex that manufactured nuclear weapons components under the jurisdiction and control of the U.S. Department of Energy (DOE) and its predecessor agencies. To accommodate construction of the plant, a parcel of land—located 16 miles northwest of Denver, Colorado, in northern Jefferson County—was acquired in 1951. Additional parcels acquired in 1974 and 1975 increased the size of the site to approximately 6,500 acres.

The Rocky Flats site is situated on a plateau at the eastern edge of the Front Range of the Rocky Mountains, at an elevation close to 6,000 feet. Most of the property was used as a security buffer surrounding the site's 385-acre industrial area.

From 1952 to 1994, the plant's primary mission was producing nuclear and nonnuclear weapons components for America's nuclear arsenal. The key component produced at Rocky Flats was the plutonium pit, or "trigger," for nuclear weapons. Most of the triggers in our nuclear weapons stockpile were manufactured at Rocky Flats. Information on specific weapons containing Rocky Flats–built nuclear triggers remains classified. However, it is known that triggers built at this plant had components that were formed from beryllium, plutonium, stainless steel, uranium, and other materials, and were used in many different types of weapons. The Rocky Flats Plant also processed plutonium for reuse and the space program, and manufactured depleted uranium defense-related components.

The plant site was divided into three geographic areas, each fenced and safeguarded by security forces. The industrial area contained more than 800 structures, including approximately 150 permanent buildings, 90 trailers, temporary structures, sheds, tanks, and annexes to larger buildings. A heavily fenced and guarded complex of plutonium production facilities, known as the protected area, was located within the northern portion of the industrial area.

*Location of the Rocky Flats, Colorado, Site*

Federal Bureau of Investigation agents and the U.S. Environmental Protection Agency entered the Rocky Flats site in June 1989 because of alleged environmental crimes. In December the same year, nuclear production work was halted to address environmental and safety concerns. In 1990, work began toward resuming operations in the

plutonium buildings. President George H. W. Bush canceled the W-88 Trident Warhead Program in 1992 and the Rocky Flats production mission terminated. The Secretary of Energy formally announced the end of nuclear production at Rocky Flats the following year. Soon after, nonnuclear production work at the site ceased and the last shipment of defense-related materials was sent out in 1994.

After nuclear weapons components production ended, the facility's mission changed to cleanup and closure, and it was renamed the Rocky Flats Environmental Technology Site. Operational problems during the plant's history, its abrupt shutdown in 1989 for environmental and safety concerns, and standard practices used at the time caused substantial contamination consisting of plutonium, beryllium, and other hazardous substances. Unknown quantities and chemical configurations of plutonium liquids remained in process piping and tanks and classified materials were left where they were being used or processed. As a result, DOE faced one of the most significant and challenging nuclear weapons plant cleanups to date.

In early 1995, DOE estimated that cleaning up Rocky Flats would take approximately 65 years and cost more than $37 billion, making site closure seem like a distant dream.

In October 2005, DOE and its contractor completed an accelerated 10-year, $7 billion cleanup of chemical and radiological contamination in production buildings and limited areas across the site after nearly 50 years of production activities. Cleanup required decommissioning, decontaminating, demolishing, and removing more than 800 structures, including 6 plutonium-processing and fabrication building complexes. DOE removed more than 500,000 cubic meters of low-level radioactive waste, primarily generated by decontaminating and demolishing contaminated buildings, and evaluated 421 potentially contaminated environmental sites; 88 required remediation. The DOE Office of Legacy Management (LM) assumed site operation and maintenance responsibility on October 13, 2005, and received final jurisdiction in 2008.

## Regulatory Setting

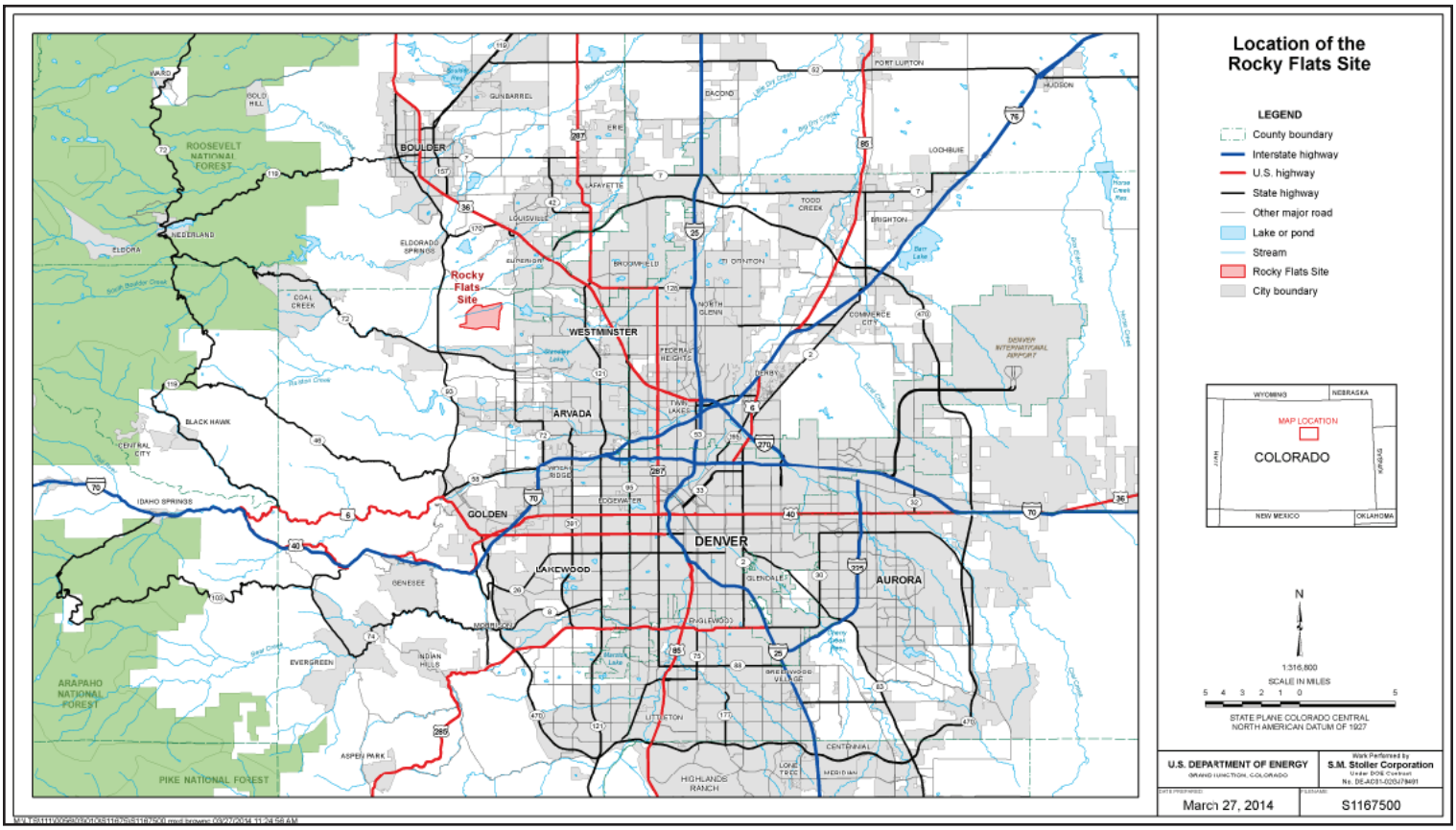
Rocky Flats was added to EPA's National Priorities List (NPL) in 1989 because environmental investigations indicated that site operations released materials defined as hazardous substances, contaminants, and pollutants by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Also released were materials considered hazardous wastes and waste constituents, as defined by the Resource Conservation and Recovery Act (RCRA) and the Colorado Hazardous Waste Act (CHWA).

Under CERCLA, and in accordance with Executive Order 12580, Superfund Implementation, DOE is delegated as the lead agency responsible for the response action for hazardous substance releases at Rocky Flats. EPA and the Colorado Department of Public Health and Environment (CDPHE) are the support agencies. DOE is also responsible for corrective action for releases of hazardous waste and hazardous waste constituents at Rocky Flats under RCRA and CHWA. In Colorado, CDPHE regulates RCRA/CHWA corrective action.

Three successive federal facility agreements and compliance orders, beginning in 1986 and culminating with the Rocky Flats Cleanup Agreement (RFCA)—signed by DOE, EPA, and CDPHE in July 1996—covered investigation and cleanup activities. Cleanup, closure, and final remedy selection met all RFCA requirements.

*Rocky Flats Site Prior to Final Cleanup (June 1995)*

*Rocky Flats Site (June 2014)*




*Location of Rocky Flats, Colorado, Site*

After cleanup, two operable units (OUs) defined the Rocky Flats site within the boundaries of the property:

1. Central OU
   - 1,309 acres
   - All site areas required additional remedial/response actions (with consideration to future land management)
2. Peripheral OU
   - 4,883 acres
   - Generally unaffected portions of Rocky Flats surrounding the Central OU

A separate no-action Corrective Action Decision/Record of Decision (CAD/ROD) dated June 3, 1997, addressed the Offsite Areas at Rocky Flats, known as OU 3.

The final remedy was selected in the September 29, 2006, CAD/ROD after completion of cleanup and closure by DOE under RFCA. The CAD/ROD was based on the results of the July 2006 Remedial Investigation/Feasibility Study, Comprehensive (Human Health and Ecological) Risk Assessment (CRA), and Proposed Plan.

Final CAD/ROD response actions:

1. Central OU
   - Institutional controls
   - Physical controls
   - Continued monitoring and maintenance
2. Peripheral OU
   - No action

The largest portion of the site (the Peripheral OU), which served as the security buffer zone, transferred to the U.S. Department of the Interior in July 2007, to be managed by the U.S. Fish and Wildlife Service as the Rocky Flats National Wildlife Refuge. Additional DOE-administered lands (745 acres) associated with private mineral rights on the site's west side transferred to the refuge in 2014.

Central OU areas and their primary contaminants, contaminated media, and waste:

- Present Landfill (PLF) waste with asbestos and hazardous waste constituents and the Original Landfill (OLF) with trash, construction debris, and some depleted uranium contamination. Landfill covers are designed and engineered with precipitation run-on and runoff controls and groundwater monitoring wells.
- PLF seep water containing volatile organic compounds (VOCs). A passive, seep-treatment system uses aeration to treat the collected seep water.
- Limited subsurface soil areas with VOCs, metals, and radionuclide contamination; and former building and infrastructure components, debris, and incinerator ash containing low levels of uranium, plutonium, and americium contamination.

- Limited areas where surface soil is contaminated with low levels of plutonium-239/240 and americium-241, which could affect surface water quality if the soils were disturbed to the extent that erosion could mobilize the contaminants.
- Limited subsurface soil areas contaminated with nitrates, uranium, and VOCs that contribute contaminants to groundwater, which may affect surface water quality.
- Limited subsurface areas where VOC contamination levels preclude occupied buildings because volatilization could lead to unacceptable VOC levels.
- Groundwater contaminant plume areas that may affect surface water quality because nitrates, uranium, and VOCs at levels above surface water standards and, in some cases, above maximum drinking water contaminant levels. Four groundwater collection and three treatment systems remove these constituents to reduce groundwater contaminant loading to surface water and meet regulatory requirements

Institutional controls prohibit uncontrolled soil-disturbances, activities that could damage landfill covers or other remedy components, and non-remedy-related surface water or groundwater use. Physical controls include signs at Central OU access-points that list the institutional controls, and Central OU perimeter signs prohibiting access. Monitoring requirements include routinely inspecting and maintaining landfill covers, treatment systems, and institutional controls; and obtaining scheduled groundwater and surface water samples from specific locations for analysis.

Contamination remaining in the Central OU prohibits unlimited use and unrestricted exposure, so CERCLA requires reviews at least every 5 years to determine whether the Central OU remedial actions continue to protect human health and the environment.

On March 14, 2007, DOE, EPA, and CDPHE entered into the Rocky Flats Legacy Management Agreement (RFLMA). The agreement establishes the regulatory framework for implementing the final remedy for the Rocky Flats site and ensuring that it protects human health and the environment. RFLMA modifies and supersedes RFCA.

*Wildlife at the Rocky Flats, Colorado, Site*

## Legacy Management Activities

The DOE Office of Legacy Management (LM) is responsible for long-term surveillance and maintenance of approximately 1,300 acres (Central OU) of the 6,200-acre Rocky Flats site. LM is also responsible for approximately 200 acres of former buffer zone land, which is now associated with an active gravel mine and will be transferred to the refuge as mining permits expire and reclamation required by Colorado law is completed.

LM is responsible for the long-term care of legacy liabilities at former nuclear weapons production sites following cleanup, disposal, or stabilization at a site or portion of a site, and in perpetuity to ensure protection of human health and the environment. These activities include maintaining all engineered and institutional controls designed to contain or prevent exposure to residual contamination and waste, record-keeping activities, inspections to evaluate surface features, groundwater and surface water monitoring, maintaining other barriers and contained structures, access control, emergency response, and posting signs.

At Rocky Flats, LM is responsible for managing land retained by DOE and for compliance with the long-term requirements outlined in RFLMA. Monitoring and maintenance responsibilities at Rocky Flats include two closed landfills, four groundwater treatment systems, and more than 100 water monitoring locations and stations. In addition to complying with RFLMA requirements, LM manages and maintains three surface water retention ponds erosion control, and revegetation.

## Contacts

Documents related to the Rocky Flats site are available on the LM website at http://www.lm.doe.gov/Rocky_Flats/Sites.aspx.

For more information about LM activities at the Rocky Flats site, contact:

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