



## Rocky Flats Site, Colorado

A CERCLA/RCRA site

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

### Site Information and History

The former 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 was acquired in 1951. Additional parcels acquired in 1974 and 1975 increased the site size to approximately 6,500 acres.

The former Rocky Flats Plant was situated on a plateau at the eastern edge of the Rocky Mountains Front Range, at an elevation close to 6,000 feet. Most of the property was used as a security buffer surrounding the plant'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 was the plutonium pit, or "trigger," for nuclear weapons. Most of the triggers in the U.S. nuclear weapons stockpile were manufactured at the former Rocky Flats Plant. Information on specific weapons containing nuclear triggers remains classified. However, it is known that triggers built at this plant had components formed from beryllium, plutonium, stainless steel, uranium, and other materials, and were used in many different types of weapons. The former Rocky Flats Plant also processed plutonium for reuse and for the space program, and manufactured depleted uranium defense-related components.

The former plant 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. The industrial area and the protected area were surrounded by a 6,000 acre security buffer zone.

In June 1989, agents from the Federal Bureau of Investigation and the U.S. Environmental Protection Agency (EPA) entered the former Rocky Flats Plant because of alleged environmental crimes. In December of 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 former Rocky Flats Plant production mission terminated. The Secretary of Energy formally announced the end of nuclear production at the plant 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 historically caused substantial contamination with plutonium within the buildings. Plutonium residues, chemicals associated with production, and chemical configurations of plutonium-containing 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. Later that year, DOE created a strong central Planning and Integration Division to provide order and consistency, and a single strategic path forward, significantly improving cleanup efficiency, thereby decreasing the associated schedule and cost.

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. Tight and efficient project management, along with the congressional promise of a steady budget, allowed for an accelerated schedule and overall reduction in cleanup costs.

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 areas. Of those, 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

The former Rocky Flats Plant was added to EPA's National Priorities List in 1989 because environmental investigations indicated that Plant operations released materials defined as hazardous substances, contaminants, and pollutants by the Comprehensive Environmental Response, Compensation, and Liability Act. Operations also released materials defined as hazardous wastes and waste constituents by the Resource Conservation and Recovery Act and the Colorado Hazardous Waste Act.

Under CERCLA, and in accordance with Executive Order 12580, *Superfund Implementation*, DOE is delegated as the lead agency for responding to hazardous substance releases at the current Rocky Flats Site, also known as the Central Operable Unit. EPA and the Colorado Department of Public Health and Environment are the support agencies. DOE is also responsible for corrective action for hazardous waste and hazardous waste constituents releases 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 — signed by DOE, EPA, and CDPHE in July 1996 — covered investigation and cleanup activities, which DOE completed in 2005. Cleanup, closure, and final remedy selection met all RFCA requirements.

The final remedy was selected in the Sept. 29, 2006, Corrective Action Decision/Record of Decision. The CAD/ROD was based on the results of the July 2006 Remedial Investigation/Feasibility Study, Comprehensive (Human Health and Ecological) Risk Assessment and Proposed Plan.

The former Rocky Flats Plant property was divided into two operable units:

### **Central Operable Unit, also known as the Rocky Flats Site.**

- 1,309 acres.
- Areas requiring continued remedial/response actions (with consideration to future land management).
- Final CAD/ROD response – Institutional and physical controls; continued monitoring and maintenance.

### **Peripheral Operable Unit, also known as the Rocky Flats National Wildlife Refuge.**

- 4,883 acres.
- Generally unaffected portions of the property surrounding the COU.

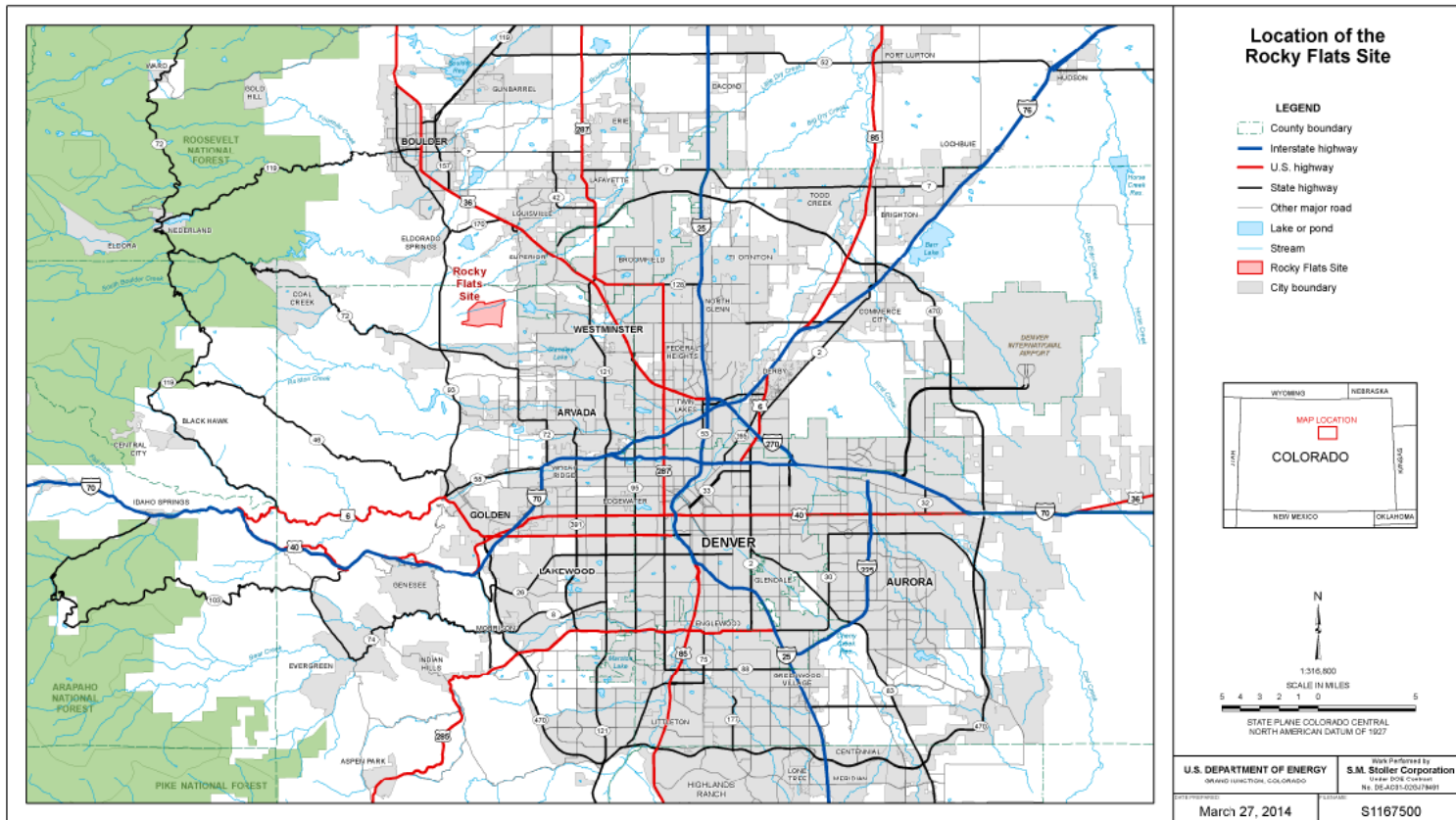


*Rocky Flats Site Prior to Final Cleanup (June 1995).*



*Rocky Flats Site (June 2014).*





Location of Rocky Flats Site, Colorado.

- Hazardous substances, pollutants, or contaminants are below levels of concern, allowing unlimited use and unrestricted exposure.
- Final CAD/ROD response – No action.

The POU represents the largest portion of the former Rocky Flats Plant property, and previously served as a security buffer zone around the industrialized area. The POU was 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. An additional 745 acres of DOE-administered lands associated with private mineral rights transferred to the refuge in 2014.

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

The COU areas (and their primary contaminants, contaminated media, and waste) include:

- The Present Landfill waste with asbestos and hazardous waste constituents, and the Original Landfill with trash, construction debris, and some depleted uranium contamination.
  - Landfill covers are designed and engineered with precipitation run-on and runoff controls, and wells are installed to monitor the groundwater.

- PLF seep water containing volatile organic compounds.
  - A passive treatment system uses aeration to treat the collected seep water.
- Limited subsurface soil areas with VOCs, metals, or radionuclide contamination; former building and infrastructure components, debris, and incinerator ash containing low levels of uranium, plutonium, or 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, or 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 in indoor air.
- Groundwater contaminant plume areas that may affect surface water quality because of nitrates, uranium, or VOCs at levels above surface water standards and, in some cases, above maximum drinking water contaminant levels.
  - Four groundwater collection and three treatment systems, including the PLF system previously mentioned, remove these constituents to reduce groundwater contaminant loading to surface water.

Institutional controls prohibit unapproved 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 COU access points listing institutional controls, and COU perimeter signs prohibiting access. Monitoring requirements include routinely inspecting and maintaining landfill covers, treatment systems, priority areas of the COU, and institutional controls; and obtaining scheduled groundwater and surface water samples from specific locations for analysis.

Due to contamination remaining in the COU, the area is not approved for unlimited use and does not offer unrestricted exposure. CERCLA requires reviews at least every five years to determine whether COU remedial actions continue to protect human health and the environment.

## Legacy Management Activities

The DOE Office of Legacy Management (LM) is responsible for long-term surveillance and maintenance of approximately 1,300 acres of the COU. 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 U.S. Department of Interior as mining permits expire and reclamation required by Colorado law is complete.

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, groundwater treatment, maintaining other barriers and contained structures, access control, emergency response, and posting signs.

At the Rocky Flats Site, LM is responsible for managing land retained by DOE and for compliance with the



Wildlife at the Rocky Flats Site, Colorado.

long-term requirements outlined in RFLMA. Monitoring and maintenance responsibilities at the Rocky Flats Site include two closed landfills, four groundwater collection systems, three 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 controls, and revegetation.



## CONTACT INFORMATION

**IN CASE OF AN EMERGENCY AT THE SITE,  
CONTACT 911**

**LM TOLL-FREE EMERGENCY HOTLINE:  
(877) 695-5322**

Site-specific documents related to the **Rocky Flats Site, Colorado**, are available on the LM website at [www.energy.gov/lm/rocky-flats-site-colorado](http://www.energy.gov/lm/rocky-flats-site-colorado)

For more information about LM activities at the **Rocky Flats Site in Colorado**, contact:

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