

## Summary of Air Monitoring Data from the Rocky Flats test burn of April 6, 2000

By John Rampe  
Deputy Assistant Manager, Environment and Infrastructure  
Rocky Flats Field Office  
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### Background

The Rocky Flats Environmental Technology Site conducted a controlled test burn of approximately 50 acres of its buffer zone Thursday morning, April 6, 2000. The following discusses the methodology and preliminary results.

### Methodology

During the test burn DOE contractors and the U.S. Environmental Protection Agency Region VIII (EPA) took separate air monitoring samples using high-volume air samplers. Both sets of samplers collected samples three to six feet from the ground, were well immersed in the plume, and collected substantial samples of smoke from the burn. These samplers were placed on the upwind and the downwind side of the burn.

Data from these samples, as well as a simplified calculation of the possible radiation dose resulting from exposure to the smoke from the test burn, are attached.

The air monitors are designed to capture essentially all airborne particles on filters. These filters are then analyzed for alpha radiation activity. Plutonium is an alpha particle emitter. There are also numerous naturally occurring and common elements that emit alpha radiation, such as radon.

A blank filter is analyzed and compared to the filters used in the sampling to distinguish any alpha activity that might occur naturally from the filter.

### Preliminary Results

Alpha radiation levels for both upwind samples and for the blank filter were below the laboratory detection limit of 1.5 disintegrations per minute (dpm), or showed less than minimum detectable activity. Only the downwind sample had a measurable activity, slightly above minimum detectable activity, of approximately 2.0 dpm. Using the volume of air sampled, and correcting for the area of the filter, this resulted in an alpha activity of 0.2 picoCuries per cubic meter of air sampled (pCi/m<sup>3</sup>).

The analysis then treated all of the activity as though it had resulted from plutonium. This is a conservative assumption, since the natural radionuclide sources, e.g. Uranium, have not been subtracted. Also, the dose resulting from plutonium activity is somewhat higher than the dose from the same activity for some other radionuclides such as uranium.

The analysis resulted in an extrapolated dose of 0.2 millirem (mrem) to someone located at that air sampler (which was continually in the smoke plume) for the entire time the



sampler was running. This value was derived using regulatory-based values for the concentration of plutonium in air that would result in a 10 mrem annual exposure (these were from the National Emission Standards for Hazardous Air Pollutants, NESHAP) and converted to allow for the time the air monitor was actually running (82 minutes).

Since all the alpha activity was assumed to be from plutonium, the actual dose a co-located individual would have received is less, since most of the activity observed on the filter is from natural radioisotopes.

This estimated dose is low when compared to natural radiation exposures, which range to about 400 mrem/year or about 1 mrem/day in Colorado. This calculated dose is consistent with other observations made during the test burn.

Radiological scans of burn site personnel exiting the area showed no detectable radioactivity, and results from dosimeters worn by firefighters also showed no detectable exposure.

This level of exposure from this burn would be roughly equivalent to a burn in similar areas outside of Rocky Flats

#### **Additional Analysis**

EPA Region VIII is conducting an isotopic analysis of the filters, as well as an alpha-beta analysis. This isotopic analysis will distinguish individual radioactive elements such as Plutonium and Uranium. It will show what specific contaminants are present and in what quantities. An isotopic analysis takes three-four weeks to complete. EPA has agreed to share these results with the community as soon as they are available

DOE will continue to analyze data from the air monitors, including calculating the potential exposure to an off-site individual (such as someone along Highway 93), and, as isotopic data become available, doing more detailed exposure modeling of a person at the scene of the test burn. All of this information will be available to the public. Additionally, DOE will hold its remaining filter samples, and will make them available on request for analysis by an independent party.

