

Contact with contaminated water, the most significant potential direct exposure pathway, was considered to be a negligible health risk because contaminated surface and ground waters were not used as sources for drinking water.

Assessment of the various environmental media on the Site determined that certain contaminants of concern were within acceptable human health risk ranges and others were not. However, as established in the ROD, remediation of uranium mill tailings to meet specific cleanup standards was required on the Site regardless of risk assessment results. The numerical and supplemental cleanup standards set forth at 40 CFR part 192 for Ra-226, radon, and gamma radiation were the principal standards used to define acceptable health risk levels on the Site, including the OU II Non-Surface and Ground-Water Impacted Peripheral Properties. There were no human health risks associated with surface water or ground water located on the OU II Non-Surface and Ground-Water Impacted Peripheral Properties because these media were not contaminated on these properties.

All properties comprising the Site, including the OU II Non-Surface and Ground-Water Impacted Peripheral Properties, were individually evaluated to determine the presence of radiological contamination. After obtaining access permission from the property owner(s), a radiological inclusion survey was conducted by DOE-GJO or a DOE-GJO contractor to determine whether the property qualified for inclusion into the Site cleanup project. The property was excluded from the project and no further action was taken when radiological contamination exceeding project cleanup standards was not detected. When contamination exceeding project cleanup standards was detected, the property was included by DOE-GJO into the Site cleanup project.

The property owner(s) signed a Remedial Action Agreement (RAA), which granted access to the property for surveys and construction and defined any construction completion requirements or remuneration for dislocation or structure demolition. A DOE-GJO contractor performed a detailed radiological assessment survey of the property that was used as the basis for the Remedial Action Design (RAD) and cost estimate. When the presence of nonradiological hazardous substances was suspected, the property was surveyed to determine whether remediation of nonradiological

hazardous substances was required. A RAD report was approved by DOE-GJO and concurred with by UDEQ. The RAD report presented the assessment survey results and the design for remedial action for the property.

Response Actions

Radioactive materials, primarily in the form of soil contaminated with uranium mill tailings and residues from ore stockpiles, were removed from the OU II Non-Surface and Ground-Water Impacted Peripheral Properties. Remedial activities consisted of the following:

- Excavation of contaminated material from the OU II Non-Surface and Ground-Water Impacted Peripheral Properties began in June 1989. All contaminated soil and construction materials exceeding the cleanup standards specified in 40 CFR 192.12, except where supplemental standards were implemented, were excavated and disposed by the DOE-GJO Remedial Action Contractor (RAC).
- After removal of contaminated material and before backfilling, verification surveys were performed by the DOE-GJO RAC to demonstrate compliance with the 40 CFR 192.12 cleanup standards. For the supplemental standards properties and property MP-00211-VL, verification surveys were performed to demonstrate compliance with property-specific cleanup levels corresponding with current land use scenarios. Verification surveys were completed on the OU II Non-Surface and Ground-Water Impacted Peripheral Properties by January 2000.
- Post-construction monitoring of radon levels was performed, where applicable, to verify compliance with 40 CFR 192.12 cleanup standards.
- Backfill was placed in excavated areas and properties were reconstructed to a physical condition comparable to that which existed before remedial activities.
- EPA, UDEQ, and DOE-GJO conducted numerous Site visits throughout the course of remedial activities, including at the OU II Non-Surface and Ground-Water Impacted Peripheral Properties, to observe assessment surveys, remedial action, verification sampling, and restoration.
- Contaminated material removed from the OU II Non-Surface and Ground-Water Impacted Peripheral Properties was disposed in a repository built approximately one mile south of the former Millsite. The repository, part of OU I of the Site, contains a double high density polyethylene (HDPE) liner with a leak detection system, thereby

meeting the functional equivalence of a RCRA Subtitle C hazardous waste disposal facility. The repository cover is approximately 8.5 feet thick and includes a radon barrier.

- The DOE-GJO RAC prepared a Property Completion Report (PCR) for each of the remediated OU II Non-Surface and Ground-Water Impacted Peripheral Properties. The PCRs document the remedial activities performed for each property, including assessment results, verification surveys, and volumes and areas excavated. EPA and UDEQ approved all PCRs for the OU II Non-Surface and Ground-Water Impacted Peripheral Properties by March 5, 2001.
- Advanced Infrastructure Management Technologies (AIMTech) (formerly Oak Ridge National Laboratory (ORNL)), the DOE-GJO independent verification contractor (IVC), performed verification of field surveys and measurements, physical sampling, and laboratory analyses for 10 percent of the Site properties. AIMTech performed 100 percent reviews for DOE-GJO RAC documents that reported remedial activities for the OU II Non-Surface and Ground-Water Impacted Peripheral Properties.
- The DOE-GJO RAC prepared a Remedial Action Report (RAR) for the OU II Non-Surface and Ground-Water Impacted Peripheral Properties. The RAR summarizes the remedial actions completed on the properties, the performance standards used to direct the remedial actions, the cost of the remedial actions, and the operations required to preserve the effectiveness of the remedial actions. UDEQ and EPA approved the RAR on May 18, 2001, and June 4, 2001, respectively.

Cleanup Standards

Cleanup standards associated with radioactive materials in tailings-contaminated soils and sediment were the primary standards used to define acceptable health risk levels and to guide remediation efforts for the OU II Non-Surface and Ground-Water Impacted Peripheral Properties. No radiological or nonradiological contamination was identified in surface water or ground water located on these properties, therefore cleanup standards associated with these media were not applicable. Gamma radiation and radon gas were identified as the primary tailings-related radiological contaminants of concern. Reduction of gamma radiation and radon gas associated with uranium mill tailings was achieved through the cleanup of Ra-226. The principal source of radiological cleanup standards used for the