

Homestake–Grants Uranium Recovery Facility

Site Location and Facility Description

The Homestake Mining Company of California (Homestake) owns and manages the Grants Project located in the Grants Mining District 5.5 miles northeast of Milan in Cibola County, New Mexico (Figure 1). Homestake conducted uranium milling operations from 1958 to 1990. The site is in decommissioning phase with an ongoing restoration program, which began in 1977, and is scheduled to be completed in 2017.

The Grants Project area includes a decommissioned mill site and two tailings piles: a large tailings pile (200 acres and approximately 100 feet high) and a small tailings pile (40 acres and approximately 25 feet high) that contain a total of approximately 22 million tons. The large tailings pile is currently capped with a radon barrier, has an erosion-protection cover on its sides, and has an interim soil cover on its top. A final radon barrier will be constructed after the tailings are flushed with water from deep wells or from the reverse osmosis (R.O. plant). The small tailings pile is also capped

by an interim soil cover. Once the groundwater restoration is complete, a final radon barrier will be constructed.

Currently, there are two evaporation ponds (Figure 2), an ion exchange treatment building for groundwater remediation, and several administrative and maintenance buildings. A third evaporation pond is being constructed and should be operational in 2011. The use of lined evaporation collection ponds (east and west ponds) began in October 1986 when the two ponds were constructed. The east pond, located on the small tailings pile, began receiving water in November of 1990. Usage of the west pond began in March 1996. From 1977 to date, more than 600 wells have been installed at the Grants site for groundwater injection, collection, and monitoring purposes. The groundwater reclamation system includes four irrigation systems at the site: two center pivot surface application areas and two flood irrigation areas (Figure 2).

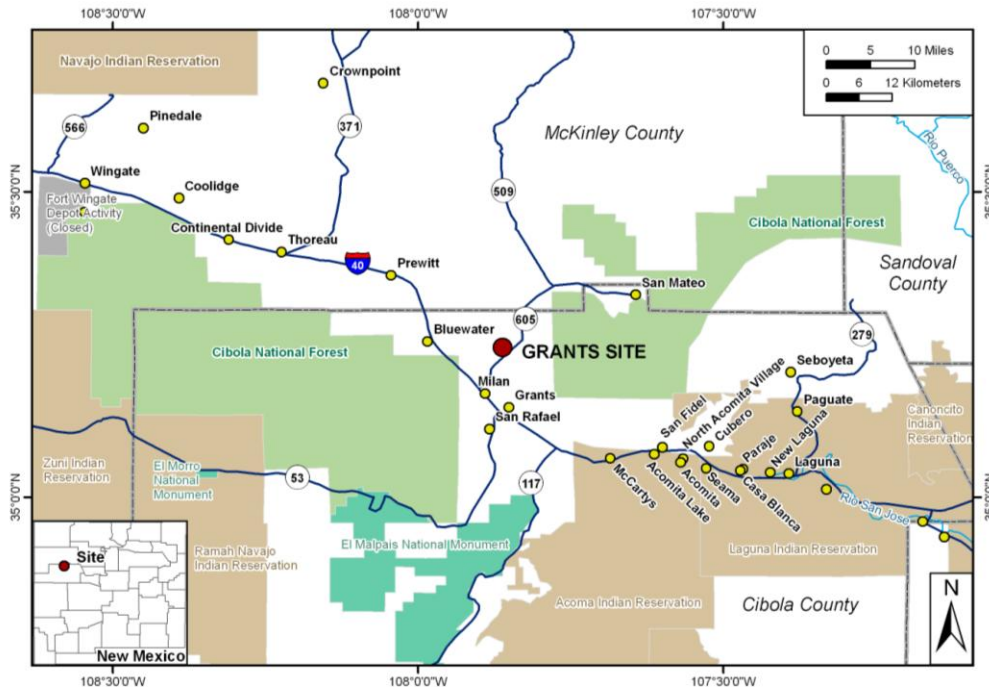


Figure 1. Grants Uranium Mill Site Location Map

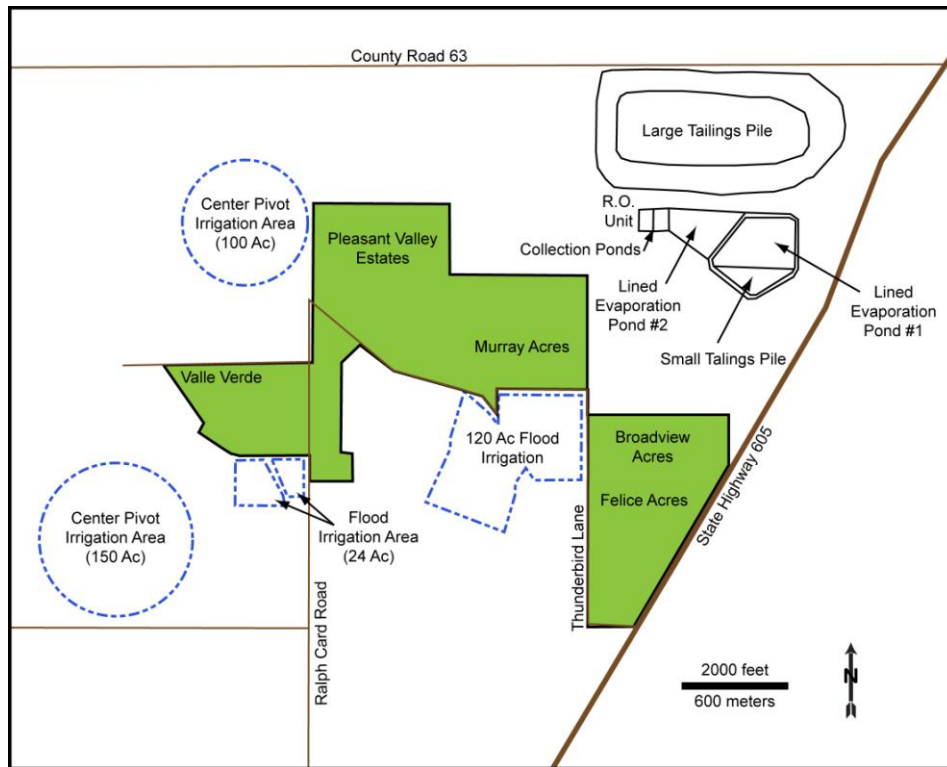


Figure 2. Grants Site Layout¹

Facility Licensing and Operating History

U.S. Nuclear Regulatory Commission (NRC) Source Materials License No. SUA-1471 was originally issued to Homestake in 1957 by the Atomic Energy Commission. During operations, ore was brought to the site for processing from various mines up to 50 miles away. Homestake deposited uranium tailings into two unlined tailings piles that overlie the San Mateo alluvium.

Tailings Management and Disposal

Historically, the contaminants resulting from the mining operations are found in two different aquifer systems. The alluvial system, which averages approximately 100 feet deep, extends generally north to south encompassing the San Mateo alluvial aquifer. In addition, a second aquifer system is found within the Chinle formation underlying the San Mateo alluvium. It comprises

three separate aquifers designated as the Upper, Middle, and Lower Chinle aquifers.

Homestake’s long-term goal is to restore the groundwater aquifers to levels as close as practicable to the upgradient background levels. In 1989, NRC established groundwater protection standards for the Homestake site as “background concentrations” from a single alluvial monitoring well. In December 2005, Homestake proposed revising these standards in the alluvial aquifer, Chinle mixing zone, and Chinle nonmixing zones. In 2006, NRC, U.S. Environmental Protection Agency, and New Mexico Environment Department established new groundwater protection standards for 10 constituents in the alluvial and Chinle aquifers. These standards were based upon samples collected at different times and vary with each aquifer.

¹Homestake Mining Company of California. “2008 Annual Monitoring Report/Performance Review for Homestake’s Grants Project Pursuant to NRC License XUA-1471 and Discharge Plan DP-200.” Grants, New Mexico: Homestake Mining Company of California. 2009.

Tailings wells were installed in the large tailings pile beginning in 1994 to remove water from the tailings pile, and wells have been periodically added through 2008. Twenty-six additional tailings injection wells and one additional monitoring well were drilled in 2008. An additional 5-inch-diameter dewatering well was drilled in 2008. A series of toe drains has been installed around the large tailings pile to intercept perched groundwater seeping from the tailings into the alluvium.

Homestake continues to operate the groundwater extraction/injection system at the former mill site to dewater the large tailings pile and clean up groundwater contaminated by tailings seepage. A groundwater collection area has been established and is bounded by a downgradient perimeter of injection/infiltration wells and trenches. Alluvial groundwater that flows beneath the tailings enters this collection area. All groundwater in the alluvial

aquifer that is within the collection area is captured by the collection well system. Collected groundwater is purged to the Reverse Osmosis plant for treatment and reinjection into the aquifers, or to the evaporation ponds. Homestake is also operating a secondary groundwater extraction and irrigation system to remediate the downgradient portion of the contaminant plume. Nearly 4.5 billion gallons of contaminated water have been removed, and 540 million gallons of treated water have been injected into the aquifer.

Additional Information

For more information about the Grants uranium recovery facility, visit the NRC uranium recovery website at <http://www.nrc.gov/info-finder/materials/uranium/> or contact the NRC facility project manager, John Buckley, at (301) 415-6607 or john.buckley@nrc.gov.