



Nevada Offsites

Gasbuggy, New Mexico, Site

*This fact sheet provides information about the Gasbuggy, New Mexico, Site.
This site is managed by the U.S. Department of Energy Office of Legacy Management.*

Site Description and History

The Gasbuggy site is located in northwestern New Mexico in Rio Arriba County, approximately 55 miles east of the city of Farmington, and 12 miles southwest of Dulce, New Mexico, in the Carson National Forest. The Gasbuggy site consists of one section of land totaling 640 acres.

On December 10, 1967, the U.S. Atomic Energy Commission (AEC), a predecessor agency of the U.S. Department of Energy (DOE), detonated a 29-kiloton-yield nuclear device 4,240 feet below ground surface in an attempt to stimulate production of natural gas from deeply buried, low-permeability, gas-bearing formations. This was the first natural-gas-reservoir stimulation experiment in the Plowshare Program, which was designed to develop peaceful uses for nuclear energy. AEC, the U.S. Department of the Interior, and the El Paso Natural Gas Company jointly sponsored Project Gasbuggy.

The blast created a cavity and a chimney of rubble above and within it. The purpose of the detonation was to stimulate flow of natural gas through the fractures created by the blast and use the chimney as a collection chamber. No radiation was released at the surface at the time of the blast. The molten rock in the cavity encapsulated most of the radionuclides from the detonation.

Project Gasbuggy stimulated gas production in greater quantities than in nearby conventional gas wells, but the natural gas was radioactive. Test results also indicated that the gas had a significantly lower heat value. Gas production tests and project evaluation activities were conducted from 1967 until 1976. Fracturing into the gas-bearing formation outward from the chimney (above the cavity) did not penetrate as extensively as expected.

AEC decommissioned and demobilized the site in 1978. Structures and equipment used for the test were decontaminated, if necessary, and removed; liquid radioactive waste was injected into the cavity formed



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Location of Gasbuggy, New Mexico, Site

by the nuclear explosion; solid radioactive waste was removed to the Nevada Test Site; and test wells were decommissioned and plugged. Soil sampling was performed in 1978, 1986, 2000, and 2002. Cultural resources, endangered and sensitive species, and floodplain and wetland surveys were performed in 1993. Final surface remediation was completed in 2004.

Surface Conditions

Remediation of the surface resulted in the removal of 5,562 cubic yards of contaminated soil from mud pits and was completed in September 2004. No further corrective actions are required for the surface and shallow subsurface.

A permanent monument consisting of a brass plaque mounted in a concrete base was placed at surface ground zero at the site. Wording on the plaque describes the historical significance of the project and restrictions on subsurface excavation.

Subsurface Conditions

DOE does not plan to remove subsurface radioactive contamination in or around the test cavity because no feasible technology exists to do so. The DOE Office of Legacy Management (LM) will conduct monitoring to ensure that detonation-related contamination does not migrate offsite.

Land Use

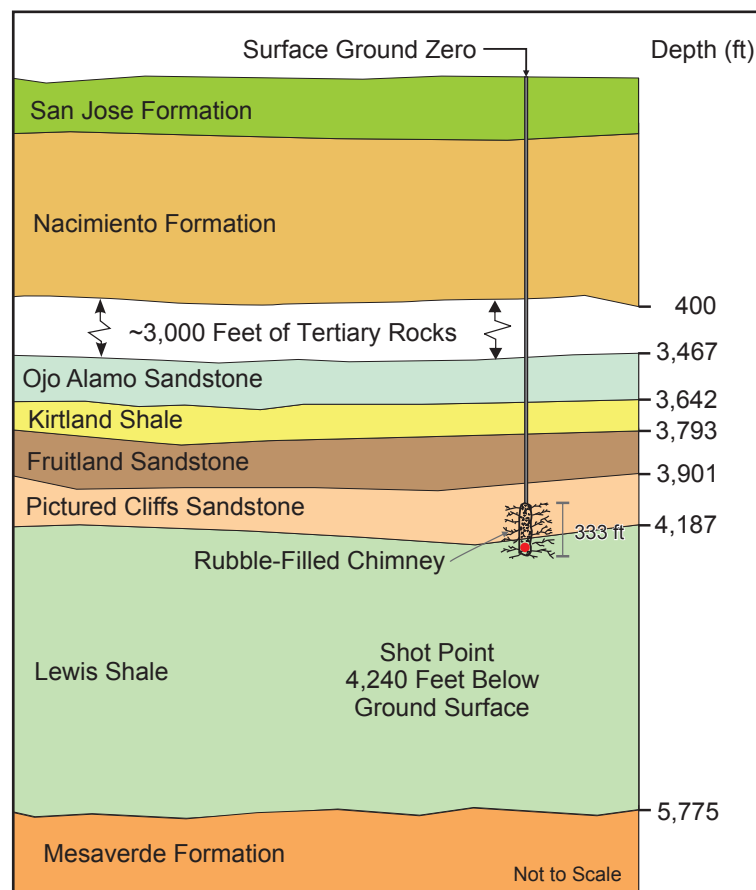
The site is located in the Carson National Forest. Prior to Project Gasbuggy, the land was open range and was used for livestock grazing and recreation. The Secretary of Agriculture, through the U.S. Forest Service, has jurisdiction over Carson National Forest. There are no surface use restrictions for the site, and the Forest Service has returned the land to its pre-Gasbuggy uses with the addition of historical markers describing the Gasbuggy test and a small parking area at Surface Ground Zero.



Gasbuggy, New Mexico, Interpretive Site

Institutional Controls

DOE controls subsurface activities to a depth of approximately 4,700 feet below ground surface, within the southwest quarter of section 36, township 29 north, range 4 west, of the New Mexico Principal Meridian. DOE's control was obtained through a combination of a 1967 Public Land Order withdrawing the section of land where the Gasbuggy test was conducted and contractual



Cross Section of the Gasbuggy, New Mexico, Site

language providing the AEC with all pre-existing oil and gas leasing rights within the 160-acre quarter section where the test was conducted. Current subsurface restrictions are stated on the monument placed at the site. In summary, the inscription states no subsurface intrusion within the radius of 100 feet from Surface Ground Zero to a true vertical depth of 1,500 feet, and no subsurface intrusion within a radius of 600 feet from Surface Ground Zero to a true vertical depth between 1,500 feet and 4,500 feet without permission of the U.S. government. No institutional controls are required for the surface of the Gasbuggy site. Additionally, DOE has executed a Memorandum of Understanding with the U.S. Forest Service and the U.S. Bureau of Land Management outlining the respective roles and responsibilities of each agency regarding notification and monitoring of natural gas and subsurface water development in the vicinity of Gasbuggy. This agreement states that DOE can conduct monitoring to assure continued protectiveness of human health and the environment.

Long-Term Hydrologic Monitoring Program

Starting in 1972, the U.S. Environmental Protection Agency monitored groundwater and surface water near the Gasbuggy site annually as part of the Long-Term Hydrologic Monitoring Program. Samples were collected from several springs, ponds, surface water drainages, ranch wells, and livestock watering wells near the Gasbuggy site. The sampling locations were on

the National Forest, Jicarilla Apache Reservation, and private property. Since 2008, LM has conducted the hydrologic monitoring. Following the 2009 sampling event, hydrologic monitoring was reduced to once every five years since no Gasbuggy-related contamination had been detected at the monitoring locations.

Natural Gas Monitoring Program

In 2009, DOE began monitoring natural gas, and water produced with natural gas, at active gas wells in the vicinity of the Gasbuggy site. In 2015, DOE, U.S Forest Service, and U.S. Bureau of Land Management evaluated and modified the sampling approach to be based on cumulative production, and well proximity. To date, no evidence of Gasbuggy-related contamination has been detected at the gas wells sampled.

Regulatory Setting

DOE is responsible for Gasbuggy-related contamination. The DOE Office of Environmental Management (EM) has completed environmental restoration of the surface and has applied for closure status for the surface through the New Mexico Voluntary Remediation Program, administered by the New Mexico Environment Department.

Legacy Management Activities

On October 1, 2006, responsibility for the Gasbuggy site transferred from EM to LM. LM is responsible for long-term surveillance and maintenance, which includes accepting the transfer of records and managing site records.

Contacts

Documents related to the Gasbuggy site are available on the LM website
<https://www.lm.doe.gov/gasbuggy/Sites.aspx>.

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

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