



Gasbuggy, New Mexico, Site A Nevada Offsite

This fact sheet provides information about the **Gasbuggy Site**. Long-Term stewardship responsibilities for this site are managed by the **U.S. Department of Energy Office of Legacy Management**.

Site Information 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 in the emplacement well (GB-E) at a depth of 4,227 feet in an attempt to stimulate production of natural gas from the overlying gas-bearing Pictured Cliffs Formation. The detonation produced extremely high temperatures that vaporized a volume of rock, temporarily creating a cavity surrounded by a fractured area extending outward from the detonation point. Shortly after the detonation, the overlying fractured rock collapsed into the void space, creating a rubble-filled collapse chimney that extends above the detonation point. As the former cavity cooled, the melted and vaporized rock collected and solidified at the bottom of the former cavity (now the lower part of the collapse chimney). Most of the high-melting-point radionuclides were trapped in this solidified melt rock, which is often referred to as melt glass due to its (glassy) texture.

The purpose of the detonation was to stimulate flow of natural gas through the fractures created by the blast and use the collapse chimney as a collection chamber. 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.

A reentry well (GB-ER) was drilled into the collapse chimney created by the detonation, and contaminated gas in the detonation zone (former cavity and collapse chimney) was produced and flared through a series of production tests. Production testing began in July 1968 and ended in October 1969 after producing 213 million cubic feet of natural gas during five tests. The test stimulated gas production in greater quantities than in nearby conventional gas wells, but the natural gas still had measurable amounts of radioactive constituents. Results of the natural gas production testing were evaluated, and it was determined that the gas had a significantly lower heat value and that fracturing into the gas-bearing formation outward from the chimney (above the cavity) did not penetrate as extensively as expected. In 1976, it was decided that no further testing would be conducted at the site.

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 former cavity, now the lower part of the collapse chimney. Solid radioactive waste was removed and transported to the Nevada National Security Site (formerly known as 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.



Gasbuggy, New Mexico, Interpretive Site

Subsurface Conditions

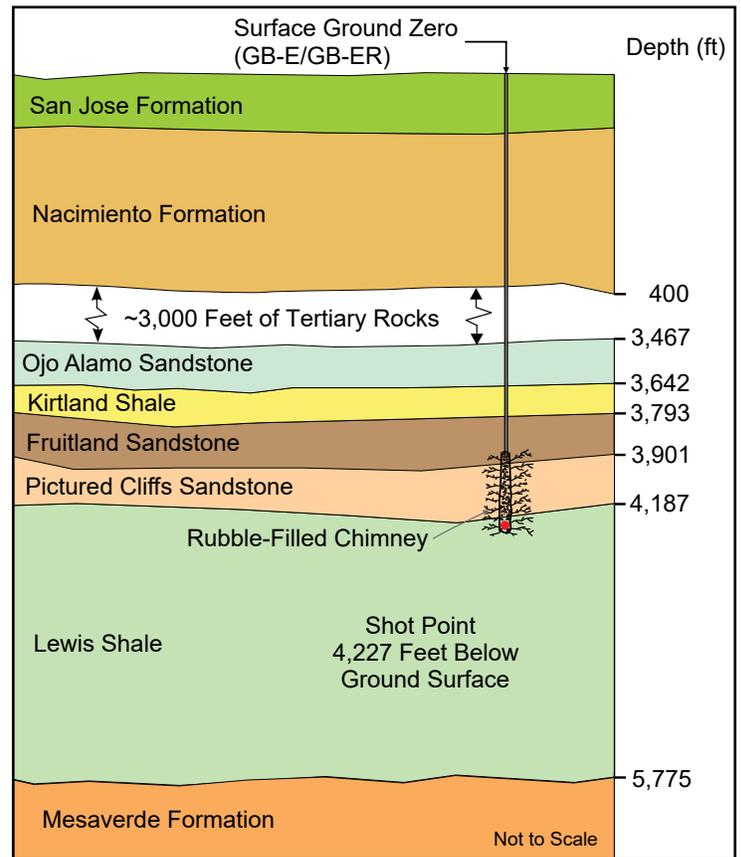
DOE does not plan to remove subsurface radioactive contamination in or around the test cavity because no feasible technology exists to do so. The DOE Office of Legacy Management (LM) will conduct monitoring to ensure that detonation-related contamination does not migrate off-site.

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.

Institutional Controls

DOE maintains institutional controls 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



Cross Section of the Gasbuggy, New Mexico, Site

withdrawing section 36 where the Gasbuggy test was conducted and terms of the contract with El Paso Natural Gas in which they granted 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 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.



CONTACT INFORMATION

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

Site-specific documents related to the **Gasbuggy, New Mexico, Site**, are available on the LM website at www.energy.gov/lm/gasbuggy-new-mexico-site

For more information about LM activities at the **Gasbuggy, New Mexico, Site**, contact:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Email:
public.affairs@lm.doe.gov

DOE Office of Legacy Management
(970) 248-6070 (monitored continuously)
(877) 695-5322 (toll-free)



www.energy.gov/lm



www.facebook.com/OfficeofLegacyManagement



www.linkedin.com/company/legacy-management