

# 2019 Gas Well Sample Results, Gasbuggy, New Mexico, Site

June 2020

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## 1.0 Introduction

The U.S. Department of Energy Office of Legacy Management conducted sampling of water associated with natural gas production from two wells near the Gasbuggy, New Mexico, Site on May 15, 2019. Water samples from gas production wells were analyzed for tritium; all sample results were below detection limits.

## 2.0 Site Location and Background

The Gasbuggy site comprises 640 acres in Rio Arriba County, New Mexico, approximately 55 miles east of the city of Farmington and approximately 21 miles southwest of the town of Dulce, in the Carson National Forest (see Figure 1). As part of Project Plowshare, one underground nuclear detonation was conducted at the Gasbuggy site on December 10, 1967, in an effort to stimulate natural gas production in the gas-bearing Pictured Cliffs Formation. The detonation took place at a depth of 4227 feet below ground surface, approximately 40 feet below the Pictured Cliffs Sandstone/Lewis Shale contact. The detonation had an estimated yield of 29 kilotons (DOE 2015).

Three natural gas production wells were selected for sampling during this event; however, one location did not produce enough water to sample. These selected gas well sample locations (Figure 1) range from 1.2 miles to 1.7 miles from the emplacement location. The wells were selected based on their proximity to Gasbuggy and the gas production is from the Pictured Cliffs Formation, the same formation targeted by Project Gasbuggy.

Environmental sampling of water wells, springs, and ponds in the Gasbuggy vicinity was conducted from 1972 through 2009. In 2009, the sampling program was modified to include sampling of seven producing natural gas wells (Figure 1). In 2014, the sampling program was again modified to exclude all surface and groundwater well sampling, reduce the number of natural gas wells sampled from seven to three, and to reduce the sampling frequency from an annual event to every five years. The sampling strategy is documented in the *Long-Term Surveillance and Maintenance Plan for the Gasbuggy, New Mexico, Site, October 2018* (DOE 2018), which can be found on the Office of Legacy Management webpage at <https://www.lm.doe.gov/gasbuggy/Sites.aspx>.

Radionuclides generated from the underground test at Gasbuggy have never been detected at any environmental sampling location.

## 3.0 Sample Analytical Results

Analytical results from the May 15 sampling event are shown in Table 1. Because of insufficient water, a sample was not collected from the Schalk 29-4 No. 007 gas well. Samples were successfully collected from the Indian A No. 002 and the Valencia Canyon Unit No. 037 wells. Tritium, the most mobile detonation-related contaminant, was not detected in either sample.

Table 1. Gasbuggy Natural Gas Produced Water Sample Analysis Results

Sample Location (API No.)	Collection Date	Tritium (pCi/L) (Detection Limit 330)
Indian A No. 002 (30-039-07525)	May 15, 2019	ND
Schalk 29-4 No. 007 (30-039-21620)	Dry	NS
Valencia Canyon Unit No. 037 (30-039-21647)	May 15, 2019	ND
Valencia Canyon Unit No. 037 (30-039-21647) (Duplicate Sample)	May 15, 2019	ND

**Abbreviations:**

API = American Petroleum Institute

ND = not detected

NS = not sampled

pCi/L = picocuries per liter

## 4.0 Conclusions

Tritium generated from the underground test was not detected at any sampled location. The next sampling event is scheduled for 2024. The U.S. Department of Energy, in coordination with the U.S. Bureau of Land Management and the U.S. Forest Service, will sample any new natural gas wells that are drilled near the Gasbuggy site.

## 5.0 References

DOE (U.S. Department of Energy), 2015. United States Nuclear Tests, July 1945 through September 1992, DOE/NV—209-Rev 16, National Nuclear Security Administration, Nevada Field Office, September.

DOE (U.S. Department of Energy), 2018. *Long-Term Surveillance and Maintenance Plan for the Gasbuggy, New Mexico, Site*, LMS/GSB/S06433, Office of Legacy Management, Grand Junction, Colorado.

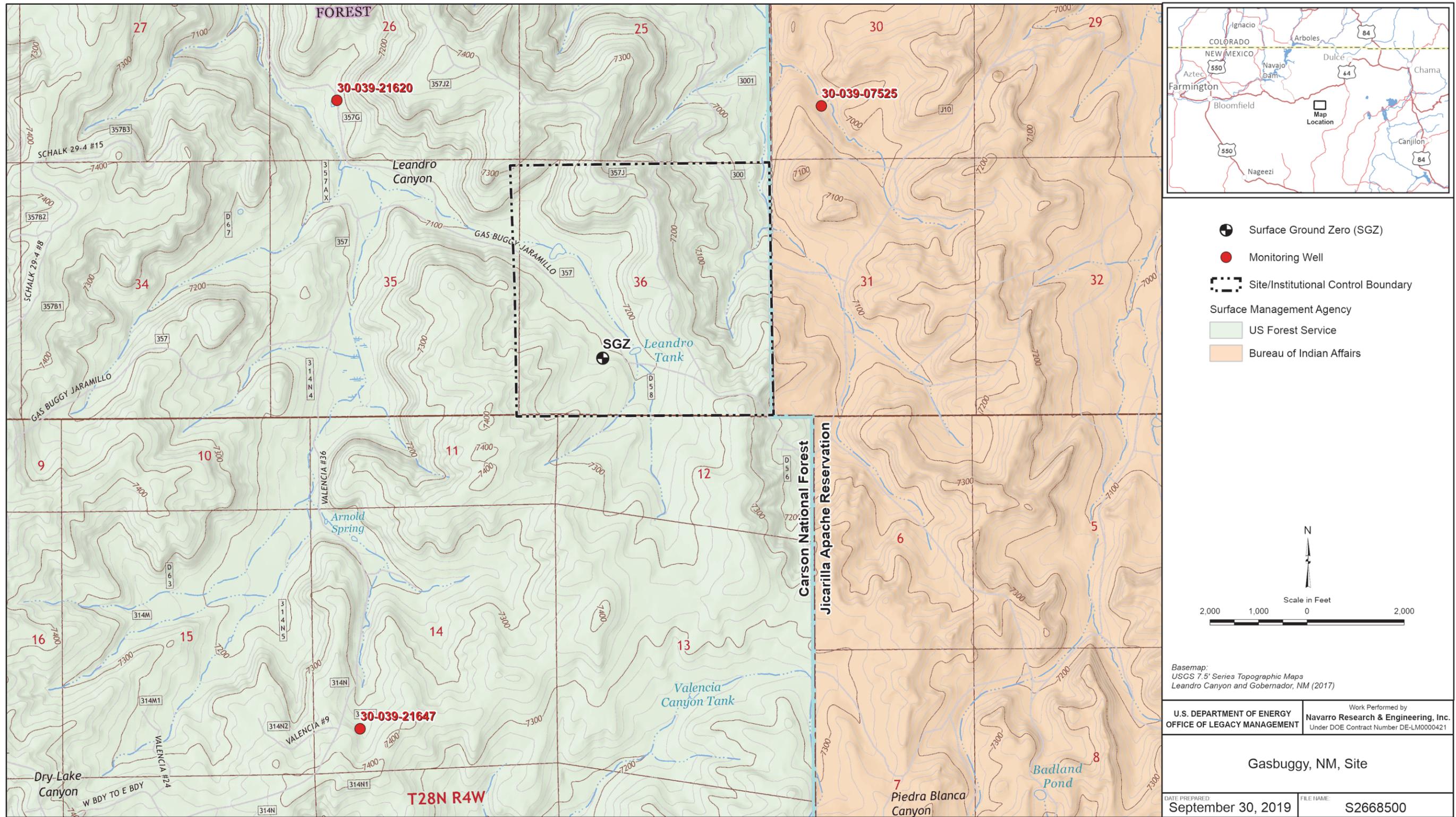


Figure 1. May 2019 Sampling Locations

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