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Drilling Ordeals Are Said to Set Back a Big Geothermal Project

By [JAMES GLANZ](#)

The Obama administration's first major test of [geothermal](#) energy as a significant alternative to fossil fuels has fallen seriously behind schedule, several federal scientists said this week, even as the project is under review because of the earthquakes it could generate in Northern California.

Intended to extract heat from hot bedrock, the project has been delayed because the bit on a giant rig, meant to drill more than two miles underground, has struggled to pierce surface rock formations, the scientists said.

The bit has snapped off at least once and become repeatedly fouled in a shallow formation called cap rock, and the drillers have twice been forced to pull it out and essentially start the hole over again.

Late last year, the project, undertaken by a start-up company called [AltaRock Energy](#), received \$6.25 million in financing from the [Energy Department](#), in hopes that it would be the first of dozens of projects to produce renewable energy by fracturing rock at the bottom of a deep hole and then circulating water through the cracks to generate steam.

But last month, after an article in The New York Times raised questions on whether AltaRock had been forthcoming about earthquakes generated by a similar project in Basel, Switzerland, the Energy Department and the [Bureau of Land Management](#) informed the company that it would not be allowed to fracture rock until the department completed a new review of whether the project would be safe. The company was allowed to keep drilling, however, down toward the depth at which it would begin the fracturing.

The scientists who told of delays in the project spoke only on the condition that they not be identified, in order to preserve their access to company progress reports. The scientists said that after nearly two months of the highly expensive drilling, the rig had reached depths of less than 4,000 feet. The original schedule called for it to reach a final depth of 12,000 feet, or 2.3 miles, after no more than 50 days of drilling, according to company officials.

The problems are particularly surprising given that the drilling essentially started at 3,200 feet, at the bottom of an older hole at the site, north of San Francisco at a place called the Geysers.

The company has also raised some \$30 million in venture capital. Among AltaRock's high-profile investors are Google and the investment firms Khosla Ventures and Kleiner Perkins Caufield & Byers.

Advocates for the technique, known as an "enhanced geothermal system," say it could eventually generate vast amounts of energy and reduce America's dependence on fossil fuels. But the latest delays come as AltaRock awaits word on whether the federal government will allow the fracturing of rock at all.

The fracturing would be virtually guaranteed to induce [earthquakes](#), which the company has said would be so small as to be nearly imperceptible but which local residents and some scientists fear could be larger. The project is in [one of the world's most seismically active areas](#).

Although the Basel earthquakes caused only minor structural damage, they frightened many in the city and led to the shutdown of the project there. The Energy Department review, likely to be released in the next few weeks, is expected to compare the Basel and California projects and determine whether AltaRock's effort is safe.

The department is "monitoring the progress of the drilling at the site and is examining the question of induced seismicity there as we weigh a final decision on the project," said a spokeswoman, Stephanie Mueller.

"We continue to believe that enhanced geothermal systems have enormous potential to provide renewable baseload energy to heat and power homes and businesses," she said. The term "baseload energy" is used to refer to sources essentially constant, like the heat in the earth's crust, rather than intermittent, like wind and [solar energy](#).

AltaRock declined a request for comment on the status of its drilling. "Please be advised that our policy is not to comment on ongoing commercial operations," James T. Turner, the company's senior vice president for operations, said in an e-mail message.

As it waits for the outcome of the Energy Department's review, the company has repeatedly pledged to avoid what it calls serious mistakes committed by the Basel project. In particular, AltaRock has said that the Basel project drilled in the vicinity of a major known fault that, the company says, was responsible for a huge earthquake that devastated the city in 1356.

But scientists at the Swiss Seismological Service and other European institutions say the fault responsible for that earthquake has never been clearly identified, let alone localized beneath the geothermal project.

"The Basel project did not drill into any known fault in the area," said Nicholas Deichmann of the Swiss Seismological Service. Most of AltaRock's public statements about that project, he said, "are simply wrong."

In response, a scientist on AltaRock's project said its description of the geothermal effort in Basel was based on documents published by scientists both in and outside the project there.

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