

Abstract

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Oil Innovations Pump New Life Into Old Wells



Monica Almeida/The New York Times

Brian Roe, a production operator, checks valves at Chevron's Kern River oil field near Bakersfield, Calif.

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BAKERSFIELD, Calif. — The Kern River oil field, discovered in 1899, was revived when [Chevron](#) engineers here started injecting high-pressured steam to pump out more oil. The field, whose production had slumped to 10,000 barrels a day in the 1960s, now has a daily output of 85,000 barrels.

Multimedia



Video

http://nytimes.feedroom.com/?fr_story=b871c2d71317d63f033a7f11f20fe708c655146b

New Life for Old Oil Fields

At Bakersfield, for example, Chevron is using steam-flooding technology and computerized three-dimensional models to boost the output of the field's heavy oil reserves. Even after a century of production, engineers say there is plenty of oil left to be pumped from Kern River.

"We're still finding new opportunities here," said Steve Garrett, a geophysicist with Chevron. "It's not over until you abandon the last well, and even then it's not over."

At the Kern River field just outside of Bakersfield, millions of gallons of steam are injected into the field to melt the oil, which has the unusually dense consistency of very thick molasses. The steamed liquid is then drained through underground reservoirs and pumped out by about 8,500 production wells scattered around the field, which covers 20 square miles.

Initially, engineers expected to recover only 10 percent of the field's oil. Now, thanks to decades of trial and error, Chevron believes it will be able to recover up to 80 percent of the oil from the field, more than twice the industry's average recovery rate, which is typically around 35 percent.

In California, the Kern River field itself seems little changed from what it must have looked like 100 years ago. The same dusty hills are now littered with a forest of wells, with gleaming pipes running along

dusty roads. Seismic technology and satellites are now used to monitor operations while sensors inside the wells record slight changes in temperature or pressure. Each year, the company drills some 850 new wells there.

Amazingly, there are very few workers in the field. Engineers in air-conditioned control rooms can get an accurate picture of the field's underground reservoir and pinpoint with accuracy the areas they want to explore. None of that technology was available just a decade ago.

“Yes, there are finite resources in the ground, but you never get to that point,” Jeff Hatlen, an engineer with Chevron, said on a recent tour of the field.

In 1978, when he started his career here, operators believed the field would be abandoned within 15 years. “That’s why peak oil is a moving target,” Mr. Hatlen said. “Oil is always a function of price and technology.”