

## Texas Sinkhole Puts Spotlight On Oil, Gas Drilling

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A stadium-size sinkhole that formed in south Texas's oil country this month is renewing questions about the effects of billions of barrels of saltwater injected into the ground each year as a byproduct of oil and gas drilling.

High energy prices have led to a surge in drilling across Texas and other states, much of it in older oil fields that tend to produce large volumes of saltwater along with crude. Meanwhile, new technologies for producing natural gas use millions of gallons of water to crack open gas-bearing rocks -- yielding contaminated water that must then be disposed of, usually underground.

The result: In 2006, the Texas oil and gas industry injected 6.7 billion barrels of liquid, mostly water, beneath the ground, and experts say that amount has been rising as new wells have multiplied and old wells are revived. Federal regulators, environmentalists and community groups worry that lax oversight is allowing some of the water -- which can be 10 times as salty as seawater and often contains oil, heavy metals and even radioactive material -- to escape from underground reservoirs. That could lead to the contamination of underground drinking-water supplies, the pollution of soil and surface water, and more sinkholes as underground structures are eroded.

"The volumes of water to be disposed of have just shot up, and the oversight isn't there," said David Frederick, an environmental attorney in Austin who has represented community groups in fights against disposal companies.

Critics have argued for several years that the Texas Railroad Commission, which oversees the oil and gas industry, hasn't kept close enough tabs on the state's more than 30,000 disposal sites, allowing problems to go undiscovered. John Tintera, in charge of technical permitting for the Railroad Commission, said the agency regularly inspects disposal facilities and scrutinizes companies for violations.

The issue was thrown into the spotlight this month when a 900-foot-wide, 250-foot-deep sinkhole opened up in Daisetta, a 1,000-population town about 60 miles northeast of Houston.

The hole appeared next to an oil-field waste-water disposal facility, which was then found to have been injecting nearly twice as much water into the ground as its disposal permit allowed. The Railroad Commission didn't discover the violation until after the sinkhole appeared, even though the company that runs the facility, Deloach Oil & Gas Wastewater Disposal, reported the greater-than-allowed volumes in monthly reports it filed with the commission. Deloach officials declined to comment.

State regulators haven't yet decided what caused the sinkhole. But Donald Van Nieuwenhuise, director of the petroleum geosciences program at the University of Houston, believes the most likely cause is that waste water eroded an underground structure called a salt dome, a deposit of compressed salt, and caused the collapse.

Critics have jumped on the Daisetta incident as evidence of the risks of underground disposal. In recent years, oil and gas production has moved closer to urban areas, especially around Fort Worth -- where a natural-gas formation known as the Barnett Shale has led to drilling at the airport, on college campuses and in residential neighborhoods. Fort Worth has banned saltwater disposal wells in the city limits, but they exist in surrounding counties.

Philip Dellinger, who oversees the Environmental Protection Agency's groundwater program in Texas, said he knows of only a handful of incidents in recent years in which saltwater reached the surface. But he believes there are more undiscovered cases where waste water has contaminated fresh-water aquifers.

The practice of underground disposal is a response to earlier environmental concerns. Until the 1960s, oil companies disposed of saltwater and other drilling waste in open pits, where it eventually entered waterways and drinking-water supplies. By comparison, underground disposal is considered safe when done correctly. Waste water is injected 1,000 feet or more below ground, under nonporous rock formations that prevent the water from escaping.

But if water is injected at too high a pressure, it can fracture the rock formation and escape. In other cases, waste water can flow up nearby oil wells or other permeations. Because much of Texas is a pincushion of old wells, many of them drilled before reliable records were kept, critics say it's difficult to know where the contaminated water might ooze up.

In recent years the EPA has pushed the Railroad Commission to do more testing to detect potential leaks before issuing permits. Mr. Dellinger said the Railroad Commission hasn't been able to keep up with inspections that might turn up problems before they result in serious contamination or erosion. Last year, the commission received 5,650 applications for new disposal sites, up 21% from 2005.

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