

Welcome to Earth Matters – field notes on the geology of New Mexico’s Enchanting Landscapes. Celebrating Earth Science Week, I’m Lewis Land.

We’ve all had those “oops” moments in our lives, where some everyday action has unintended consequences. In some cases, those consequences extend much further in time and space than we ever imagined.

In the summer of 2008 a truck driver with a water hauling company in southeastern New Mexico was parked at the site of a brine well his company was operating. The operator had taken over an abandoned oil well and converted it to an injection well, pumping fresh water into salt beds about 500 feet deep. The salt dissolved into a brine solution that was pumped to the surface to sell as drilling fluid in nearby oil fields. This process, which creates a sizeable cave in the salt beds, is common in many parts of the world. Various engineering and geotechnical methods are practiced to ensure that the resulting cavities don’t collapse, but in some cases, these strategies are not entirely successful.

The morning of the “oops” event, the truck driver noticed a rumbling noise and quickly left the site. A few minutes later a large sinkhole abruptly formed, which ultimately grew to a diameter of more than 300 feet and a depth of about 150 feet. Less than four months later, another nearby brine well collapsed, forming a sinkhole of similar dimensions. Both sinkholes formed in the middle of a giant oil field where the population of pump jacks far outnumbers the population of human beings. However, in the aftermath of these events, the city of Carlsbad discovered a third brine well operation within the city limits, same depth, same pumping history, and this potential sinkhole is located beneath a major highway intersection, an irrigation canal, a feed store and a church. The site has been continuously monitored by tiltmeters and other devices for the past six years, and a remediation plan has not been decided yet. Whatever remediation strategy is ultimately employed, it will not be cheap.

Celebrating Earth Science Week, I’m Lewis Land with the Bureau of Geology at New Mexico Tech.