

Fewer disposal wells to close in Okla. from quake

Mike Soraghan, Environment & Energy Publishing, 9-13-16

State and federal regulators have lifted the shutdown order on 22 disposal wells as they refine their reaction to the largest earthquake ever recorded in the state.

But more wells will wind up with restrictions on how much they inject under the plan announced yesterday by the Oklahoma Corporation Commission (OCC). In all, 67 wells will be restricted or shut down.

State officials said the change is the result of a new, previously unknown fault.

"The emphasis is to protect the fault where the earthquake was," said Tim Baker, director of OCC's Oil and Gas Conservation Division. "Our emphasis has shifted."

But concerns remain that there could be more large quakes like the magnitude 5.8 temblor that hit on Sept. 3.

"We see a continued possibility of an equal or larger-sized earthquake" in the state's sizable quake zone, said Jeremy Boak, director of the Oklahoma Geological Survey.

On the day of the quake, state officials had ordered 37 disposal wells closed near the quake's center. But it was centered near Osage County, home of the Osage Nation, where U.S. EPA has jurisdiction and the state doesn't. EPA followed up with an order to shut 17 disposal wells.

The state scaled its closures back to 27 yesterday with a plan that was rolled out at a news conference at OCC headquarters in Oklahoma City. At the same time, federal officials scaled back to five wells shut down.

But the wells covered by the previous order, except one, have been ordered to cut injection volumes by 25 percent. EPA officials said one well was determined to be outside the "area of concern." Restrictions will also be placed on new wells in a zone drawn around the new fault. In all, 35 wells will be allowed to operate with restrictions, 21 in OCC jurisdiction and 14 in EPA jurisdiction.

The plan will reduce injection from an average of about 75,000 barrels a day to about 35,000 barrels a day, OCC officials said. That does not include Osage.

The quake outside Pawnee, a town of 2,100 near the Arkansas River in northern Oklahoma, injured one person and damaged three houses. The U.S. Geological Survey initially listed it as magnitude 5.6 but later upgraded it to magnitude 5.8 after a technical review (*EnergyWire*, Sept. 8).

That makes it slightly larger than the 2011 quake in Prague, Okla., which USGS has upgraded to magnitude 5.7.

Oklahoma has had an epidemic of shaking since 2012, peaking last year when there were 905 quakes. There have been a handful of injuries, and most of the quakes aren't large enough to do significant damage, but many residents are concerned about the long-term effects on their homes and the difficulty of getting earthquake insurance.

Scientists have known for decades that deep injection of industrial fluid can cause earthquakes in rare cases. The fluid seeps into faults, essentially lubricating them, and they slip.

In Oklahoma, production methods that result in unusually large volumes of wastewater have combined with favorably aligned faults to cause swarms of quakes.

New fault data

On the day of the quake, state officials said they were focused on a fault near Pawnee that runs diagonally from the southwest to the northeast. Subsequent research by USGS and the Oklahoma Geological Survey moved the focus to an east-west fault.

"We have new data," said OCC spokesman Matt Skinner. "Our response has changed accordingly."

State officials have also focused on ensuring that disposal wells are not injecting into the bedrock layer called the "basement."

Seismologists say drilling into granite basement rock creates a path for wastewater injected into disposal wells to reach faults and cause earthquakes. The state has ordered the owners of disposal wells drilled into the basement to "plug back" the wells to make them shallower.

EPA has not announced any such efforts concerning disposal wells in Osage. But state officials said yesterday they expect EPA will look at requiring well operators to plug back if their wells are too deep.

"That is their intent," said OCC's Charles Lord.

A 2006 study by the Oklahoma Geological Survey identified 147 wells in the county that were drilled into the basement. The deepest was 462 feet into the basement. It's not clear from the 2006 study which of the wells, if any, were disposal wells (*EnergyWire*, Sept. 7).