Tribune Publishing

Earthquakes bumfuzzle officials

Bob Campbell, Odessa American, Texas
June 25, 2021 · 7 min read

Jun. 25—"Shake, Rattle and Roll" was a fun record by Bill Haley & His Comets in 1954, but the notion is anything but entertaining for Permian Basin residents distressed by the increasingly severe earthquakes that are jarring the region with disturbing regularity.

Apparently caused by the multitude of wells that are used either to enhance oil recovery with the injection of saltwater or to dispose of the brine produced with oil and gas, the quakes have become particularly vexatious along Highway 191 between Odessa and Midland.

The responsible regulatory agency, the Texas Railroad Commission, has extensively studied the situation but has taken no corrective action such as ordering the offending wells shut down.

Railroad Commissioners Christi Craddick, Wayne

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"Protection of public safety and the environment are critical to the railroad commission's mission," Keese said. "RRC staff, including the agency's seismologist, have been actively examining seismicity between Odessa and Midland.

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"The agency requested and has been receiving monthly reports containing daily injection volumes and pressures from a number of disposal wells in that area. New disposal well applications in the area are subject to seismic review guidelines and permitting restrictions.

"This area is also being actively studied by scientists at the Texas Bureau of Economic Geology, which runs the TexNet Seismic Monitoring System, and other academic and industry researchers," the spokesman said. "The RRC has been reviewing that research information."

The Oilfield Water Logistics Co. has two saltwater disposal wells on the Parks Bell Ranch, but a company spokesman declined comment. OWL has offices in Midland, Dallas and Denver and more than 20 field locations, according to its website.

State Sen. Kel Seliger of Amarillo said the earthquakes "have not been widely reported" and he hadn't heard much about them from his constituents here. "The Railroad Commission hired a seismologist five or six years ago," Seliger said.

"If there are findings that the wells have caused seismic activity, then yes, the commission should immediately look at those findings and take such action as it is legally entitled to take."

State Rep. Brooks Landgraf agreed that the ball is in the RRC's court. "I don't have much information to provide because the issue is mostly internal to the commission," Landgraf said.

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TexNet, told the OA that hydraulic fracturing "could be a factor in West Texas and other areas of the world.

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"We are not concluded on any results considering the causes, but they are mostly likely not natural," Savvaidis said. "We are analyzing the underground locations and depths of the earthquakes. We work with the RRC and have quarterly meetings."

Stephen Robertson, executive vice president of the Permian Basin Petroleum Association, said his organization "has been focused on this for a good number of years and has started monitoring with the RRC and TexNet.

"We're developing information and logs of the most recent events that can be useful to the RRC to help determine where the issues are and what they might want to do to alleviate those issues," Robertson said. "It's an area of concern for the PBPA because we want to be good stewards."

The U.S. Geological Survey on June 14 said there'd been 28 earthquakes in the Odessa area of 2.5 magnitude or less on the Richter Scale in the previous 30 days. Seventy-seven miles west of here, there had been 258 earthquakes of 1.5 magnitude and less around the Mentone area in Loving County in the previous 30 days.

The USGS reported a 4.0-magnitude quake Dec. 31 at a depth of 3.1 miles 11 miles north of Stanton, a 5.0 March 26 at a depth of 2.3 miles 25 miles west of Mentone and a 3.5 May 21 at a depth of 3.1 miles 7.3 miles northeast of Odessa.

A recent report by the Oslo, Norway-based Rystad Energy Co. says the crisis is worsening in West Texas and worldwide.



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"Tremors of above the magnitude of 2 on the Richter Scale quadrupled in 2020 and are on track to increase even further in frequency in 2021 if oil and gas activity sticks to its current drilling methods at the same pace," said the company, an independent energy research and business intelligence firm that provides data, tools, analytics and consultancy services to the global energy

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industry," according to its website.

Rystad also has offices in London, New York City, Houston, Moscow, Rio de Janeiro, Singapore, Bangalore, Tokyo and Dubai.

"Data from Oklahoma, Texas, Louisiana and New Mexico shows that earthquakes of above the given magnitude accumulated to a count of 242 in 2017,

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growing to 491 in 2018, 686 in 2019 and 938 in 2020," the company said. "Around 570 such tremors have been recorded through the first five months of 2021, meaning we may see a new record this year if the trend continues.

"The trend appears to be moving not only to more frequent but also larger events. So far this year, there have already been 11 individual seismic Washington Football Team eliminates fanfavorite 'Warriors' as potential new team name

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events of magnitude 3.5 or greater, which can certainly be felt but may not cause any damage — a worrying sign compared to just six such events annually in 2018 and 2019 and 14 events in 2020.

"The biggest oil and gas industry contributor to seismic activity is by far the saltwater disposal through underground injection, and the volume of disposed water climbed sharply from 2011 through White farmers blocked a much-needed federal relief program for Black farmers. The saga proved Black farmers won't overcome...

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2019 before tapering off a little in 2020 due to lower activity caused by the COVID-19 pandemic.

"While the U.S. onshore sector's water disposal in 2011 was limited to 7.7 billion barrels, the volumes quickly built up over the next years to around 10 billion barrels between 2014 and 2017. In 2018 disposed volumes reached 11.5 billion barrels and in 2019 about 12.4 billion barrels before retreating to

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forward and the cost of doing that could accumulate to above \$1 billion annually for oil and gas producers."

Rystad Energy Senior Shale Analyst Ryan Hassler of Denver said the costs can vary, "but the Permian Basin has very competitive economics compared to other areas.

"To offset the yearly growth of disposed water that Rystad Energy is forecasting due to the coming boom in the U.S. shale industry, the volumes of treated water must increase from the 1.5 billion barrels seen in 2020 to 1.7 billion barrels in 2021 and 2022, 1.8 billion barrels in 2023 and then rise even further from 2024 onwards as the needs to dispose water will again exceed 12 billion barrels due to increased activity," Hassler said.

"Earthquakes are not the only environmental issue caused by water disposal. Fresh water sourcing in arid regions of West Texas and New Mexico threaten the water supply of local communities and essential agriculture activities while environmental concerns surrounding the chemical composition of produced water serve only to fan the flames of public antipathy.

"Rystad Energy estimates that by the end of 2022, the Permian Basin, including both the Delaware and Midland sub-basins, could be able to meet between 40 and 43 percent of frac water demand from recycled produced water. To meet this target,

additional investment from the midstream space

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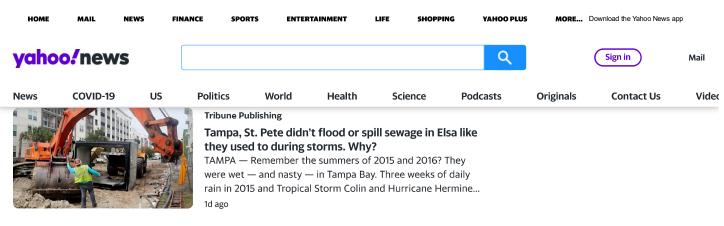


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