

Letter to the editor: Better engineering might reduce chance of earthquakes

[Letter to the editor: Better engineering might reduce chance of earthquakes](#) By John R. Bailey, Tulsa [TulsaWorld.com](#) | [0 comments](#)

Ray Bachlor was wrong when he wrote that "water injection wells do not cause stresses in the Earth's crust, but they might lubricate and relieve them incrementally before they result in large earthquakes and tragic loss of lives and property..." ("Reduce the risk of tragic earthquake," May 3).

The waste water injection wells are dealing with large volumes of incompressible liquids which are stressing geologic environs. Many of these wells are injecting waste water into geologic formations that contain incompressible liquids housed in 10 percent to 20 percent porosity rocks having some geologic permeability (how well the pores are connected while this geologic

I'm guessing that the average true vertical depth of Oklahoma disposal wells is 12,000 feet, meaning that there is approximately 5,400 pounds per square inch of pressure on the formation receiving the waste water due to the hydraulic head in the disposal well. This is without any compressor assistance. Our disposal zones are water-rich and easily cover 500-1,000 square miles filled with incompressible liquids. This receiving medium can be tortuously difficult, requiring all of the hydrostatic head and possibly additional compressor pressures to move the fluids.

When these moving liquids encounter changes in permeabilities or fractures that have been sealed or faults that have juxtaposed impermeable rocks against the selected reservoir recipient, then we start breaking rock and causing earthquakes.

These problems can be overcome with judicious engineering and scheduling.

Editor's note: *Bailey is a geophysicist.*