## Gas Markets Briefly Noted

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A University of Texas (UT) study has helped strengthen previous studies linking the disposal of wastewater from oil and gas operations into deep injection wells to seismic activity. The study showed that problems occur when the disposal wells reached basement rock formations which are much older, more brittle and have larger faults that shallow formations. The pressure from the wastewater causes these faults -- which may have been dormant for hundreds of thousands of years -- to slip, creating earthquakes. The study showed in the Permian Basin, drillers are looking for disposal wells even deeper to avoid water aquifers -- which the researchers suggest could add enough pressure on basement formations to cause earthquakes.

Oklahoma state regulators for years have linked disposal wells to seismic activity and have well-rehearsed procedures in place to respond to quakes that include shutting wells down and reducing intake volumes in others. From 1978-1999, Oklahoma averaged about two earthquakes a year; from 2014-16, amid an oil and gas drilling ramp-up, more than 2,100 quakes above magnitude 2 were recorded. The UT study was funded by nonprofit foundations and universities; it got under way in summer 2017. It examined data from the research firm IHS Markit, US Geological Survey, and state oil and gas regulators in Texas, New Mexico and North Dakota, including the Texas Railroad Commission, and the US Geological Survey, among other sources. In an attempt to stay ahead of this issue, the Texas Legislature, in its 2015 and 2017 sessions, established the TexNet Seismic Monitoring Program, which includes a network of seismic sensors overseen by UT's Bureau of Economic Geology.

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General Electric has agreed to a deal that will help it raise up to \$4 billion from selling part of its stake in Baker Hughes. The deal includes a sale to investors and a buyback by Baker Hughes that will cut GE's holding from 62.5% to a little more than 50%. GE had a deal with Baker Hughes that prevented it selling any shares until July 2019, but that commitment has been dropped. Baker Hughes agreed to let GE out of that agreement as part of a deal for the two companies to work together on critical equipment, including gas turbines. GE has also agreed to allow Baker Hughes to continue to use its software.

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A safety study on Virginia Natural Gas' (VNG) proposed Southside Connector natural gas pipeline will be delivered to the Norfolk (Virginia) city council on Nov. 20. VNG said the proposed 24-inch line will run for nine miles between the communities of Norfolk and Chesapeake and be buried about 80 feet underground. VNG has said the line is needed to move badly needed gas. The company added that its safety requirements are actually stricter than federal regulations. Citizens and some businesses opposing the line have said it will run too close to churches, schools, medical facilities and a large number of homes. The pipeline has put VNG on a collision course with 142-year-old Colanna's Shipyards, one of the largest businesses in the region. Colanna's CEO Tom Godfrey said the pipeline will cut through a portion of the shipyard and it has gone to court to fight VNG's use of eminent domain to seize the property. Colanna's sits on a 100-acre site and has three floating dry docks, one Marine Railway, a 1,000-ton crane as well as several piers and berthing spaces. In addition to the fight with VNG over eminent domain, Godfrey has been critical of the pipeline itself, saying it's a 1,250 psi system. "It is a high pressure, high volume transmission line that is not normally located in a city or urban area and it presents a lot of hazards that generally are not appropriate for a residential neighborhood."

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The National Hurricane Center said an area of interest it was monitoring Monday near the Leeward Islands has started falling apart, dropping its chances of become a tropical system from 90% to 30% over the next five days. The system is expected to bring heavy rains to the Leeward Islands, the Virgin Islands and Puerto Rico over the next several days.

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