



Oklahoma Geological Survey
Dr. Jeremy Boak, Director

Statement on USGS Hazard Assessment for Sites with Induced Seismicity

The United States Geological Survey (USGS) has just released a report documenting their assessment of the risk of damage from earthquakes induced primarily by deep injection of produced water from oil and gas operations in the central United States. The report is a one-year forecast for possible damage in 2016, based on seismic data from 2014 to 2015. The Oklahoma Geological Survey (OGS) considers this an important document describing a well-constructed technical assessment.

The primary risk estimate shows the probability of damage equal to or greater than Modified Mercalli Intensity index (MMI) of VI. MMI of VI refers to earthquakes that produce minor damage - some plaster falling, a few cracks. The probability of such damage in 2016 is less than 10% for nearly all of Oklahoma. A much larger area, which has experienced greatly increased seismic activity since 2009, and especially since 2013, shows a probability of 5-10%. Additional areas show probabilities less than 5% and less than 2%. We understand that information in the report indicates that the probability of significant damage (MMI of VII) comparable to that of the 2011 Prague earthquake is very small and occurs over a much smaller area than this primary risk estimate.

It should be noted that the report does not address the potential for cumulative damage from multiple small-to-moderate earthquakes over time. Although the OGS had expressed its interest in such assessments as part of this report, they would require a separate assessment and additional resources. The OGS has just received the report, anticipates reviewing it in much greater detail, and may choose to comment further in the future.

The seismic activity that has characterized central and northwestern Oklahoma continues to evolve rapidly, along with our understanding of the processes and geologic structures involved. Actions of the Oklahoma Corporation Commission as well as market forces may already have influenced this activity, and future assessments can be expected to change the USGS map. The OGS will continue to work with the USGS, evaluate the patterns of seismicity, and share our results with Oklahomans.

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