

Microseismic monitoring at CO₂ geological storage site - Initial data results observed at Cranfield in the U.S.-

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There are a lot of discussions on possible microseismicities induced by CO₂ geological storage. Case studies at CO₂ injection sites overseas suggest that the microseismicities caused by the CO₂ injection might be quite small should it occur, but monitoring at the injection field is necessary for ensuring safe carbon geological sequestration (CGS) and gaining public acceptance.

RITE has studied the microseismicities induced by CO₂ injection under partnership and collaboration with the Lawrence Berkeley National Laboratory and the Bureau of Economic Geology of the University of Texas. A long-term observation is underway to monitor the microseismicities at a large-scale CO₂ injection site in the U.S. Based on data and knowledge obtained by the observation, RITE will study a relationship between the CO₂ injection and microseismicities (presence/absence, scale and distribution of the microseismicities) and establish a technique of observing microseismicities, which will be demanded for prospective CGS demonstrations and practical implementation in Japan.

The observation site is located at an oil field of Cranfield in Mississippi. Enhanced oil recovery using CO₂ has been implemented there and approximately 3 M tons of CO₂ were injected. RITE deployed an observation network by installing 6 geophones within the radius of about 3 Kilometers in the field, and began the microseismic monitoring from December, 2011. This paper describes overview of the microseismic monitoring at the Cranfield site and the initial data results.

Keywords: CO₂ geological storage, Microseismic monitoring