

**Nagaoka, Japan Monitoring/Verification Program Design, Deployment and Case history**

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The Nagaoka project is the pilot-scale sequestration demonstration experiment of CO<sub>2</sub> injection into an onshore saline aquifer. One injection well and three observation wells were drilled at the test site. The CO<sub>2</sub> injection started on July 2003 and ended on January 2005. Total amount of 10,400 tons CO<sub>2</sub> was injected into the unconsolidated sandstone aquifer at the depth of 1,100m below the ground surface with about 12m thickness. Time-lapse well loggings (Induction logging, Neutron logging and acoustic logging) and cross well seismic tomography have been conducted in 2 or 3 observation wells on a regular schedule in order to detect the arrival of injected CO<sub>2</sub> and to comprehend CO<sub>2</sub> behavior in the aquifer. CO<sub>2</sub> breakthrough and subsequent changes in physical property due to CO<sub>2</sub> movement were identified clearly from time-lapse well loggings, and CO<sub>2</sub> saturation in the aquifer was able to be estimated using these well logging and seismic tomography data. After CO<sub>2</sub> injection finished, the formation fluid was sampled by CHDT (Cased Hole Dynamic Tester) at CO<sub>2</sub> bearing zone in the observation well that was detected CO<sub>2</sub> breakthrough first. The amount of CO<sub>2</sub> contained in formation fluid was almost supported the result of well logging datum.

Simulation studies attempted history matching the bottom-hole pressure changes observed as well as CO<sub>2</sub> breakthrough times.