Brine Injection Potential in Upstate New York: Making Salt-Cavern Storage Technically Feasible in Areas Remote to Ocean Disposal

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Abstract

Salt caverns are ideal for natural gas storage because of high deliverability rates and short cycle times. New York has salt in the Silurian Salina Group, which is thick enough and deep enough in the south central portion of the state to make caverns that meet industry standards. Currently within the state there are two operational salt cavern storage facilities and several others in various stages of completion. The greatest obstacle to completion of many of these salt caverns is disposal of the brine created during cavern development. The purpose of this study was to systematically analyze potential formations for their ability to accept brine within the area where the salt is thick enough and deep enough for cavern development.

Analysis of potential brine disposal reservoirs was first limited to sandstones and carbonates (excluding shales) that have acceptable reservoir characteristics. We then conducted more detailed reservoir characterization studies on the potential targets. The most promising prospects after this initial research were the Ordovician Queenston Sandstone, The Ordovician Black River Group hydrothermal dolomite reservoirs and the Cambro-Ordovician Beekmantown Dolomites. We then did further research into these prospects including detailed core and thin section descriptions, sequence stratigraphy, and reservoir properties analysis.

Parameters established during the characterization of potential disposal reservoirs were used by our collaborators at Sandia National Laboratories to model and quantify how effective brine disposal into these formations would be in our proposed reservoirs. After initial analyses the Black River carbonates stand out as the most promising potential disposal reservoirs.