

Use of Digital Log Analysis to Evaluate the Helderberg Group as a Confining Layer for CO₂ Sequestration, J. Eric Lewis, Ronald R. McDowell, and Katharine L. Avary, West Virginia Geological and Economic Survey, Morgantown, WV 26508-8079, elewis@geosrv.wvnet.edu, mcdowell@geosrv.wvnet.edu, avary@geosrv.wvnet.edu; and Kristin M. Carter, Pennsylvania Geological Survey, Pittsburgh, PA 15222-4745, krcarter@state.pa.us

The Midwest Regional Carbon Sequestration Partnership (MRCSP) has evaluated several categories of geologic reservoirs for potential carbon dioxide (CO₂) sequestration, but the reservoir type that has been determined to offer the greatest storage potential is deep, saline formations. One of the most promising formations evaluated by the partnership to date is the Devonian Oriskany Sandstone. As a sequestration target, this reservoir is generally confined by overlying and underlying limestones, chert, and shales, including those of the Siluro-Devonian Helderberg Group. Heretofore, the MRCSP had not performed detailed stratigraphic or reservoir evaluations of the Helderberg in the study area. However, a number of through-going faults intersect both the Oriskany and Helderberg throughout the Appalachian Basin, and suggest that the Helderberg Group may offer only limited potential as a confining interval, depending upon location and degree of faulting. A number of digital log analysis techniques, including electrofacies analysis, can be employed to evaluate the stratigraphy and reservoir characteristics (e.g., porosity, permeability, water saturation) of the Helderberg Group, identify heterogeneities in this sequence, and confirm the extent of fault offset.