

The War for Porosity: Competition for Underground Storage in the Appalachian Basin

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The Appalachian Basin is not only a Super Basin, but arguably the oldest and most populous Super Basin. Productive portions of the basin span part of New York, Pennsylvania, Ohio, West Virginia, Maryland, Virginia, Kentucky, and Tennessee and within or nearby the population centers one thinks of when mentioning these states. All those people can be difficult to drill around, but they also provide an opportunity for this "mature" Super Basin. All those people require energy in some form or fashion and meeting those energy demands will require underground storage in many formations for differing products.

The shale revolution in Appalachia continues and as we find more natural gas, we will need underground natural gas storage, allowing for natural gas withdrawal on demand when furnaces are turned up or when used to produce electricity. But as we move into the future and consider the increased availability of natural gas liquids produced from shales, even more storage is needed. Shell's mammoth ethane cracker plant is being built in Beaver County, PA right now, and so the need for ethane storage opportunities is now. Further, as the energy industry reaches toward the use of alternative fuels, for example, hydrogen energy, additional storage facilities will need to be considered and discovered for that hydrogen. Also, new storage will continue to be needed for electric generation plants that can capture and sequester carbon dioxide. Finally, as we continue to drill, to provide the energy for the above opportunities, we will need to find places to dispose of water and underground saltwater disposal wells are one tool for disposing flowback and produced water.

You can boil down a petroleum geologist's job as looking for porosity and permeability (hopefully with hydrocarbon in it). It tends to be the engineer's job to try to get the hydrocarbon out of the ground. We need to turn that thinking upside down and Appalachian petroleum geologists need to be looking for porosity and permeability for storage and disposal opportunities to inject product into, not pull product out of. The end of the productive life of the Appalachian Basin is long ahead of us, but to keep that "end of days" well into the future, we need to find storage opportunities for the energy we are producing today and will discover in the future.