The Ohio Borehole Project

MAKING OHIO COAL THE CLEAN CHOICE

MRCSP MIDWEST REGIONAL CARBON SEQUESTRATION PARTNERSHIP

Battelle The Business of Innovation

Purpose of the Project

The Ohio Coal Development Office (OCDO) within the Ohio Air Quality Development Authority (OAQDA) and the Ohio Department of Natural Resources (ODNR) Division of Geological Survey are collaborating with scientists from Battelle Memorial Institute to conduct geologic tests in Salem Township, Tuscarawas County. The project, called the Ohio Stratigraphic Borehole (Ohio Strat. Test), is located close to State Route 36 near an active industrial site in Salem Township, approximately two miles east of Port Washington.

The purpose of the tests is to build knowledge of the state's geology and fill in some of the data gaps that currently exist. The results of these tests are important for developing profiles of the rocks, especially their porosity, permeability and storage capacity. This will help increase our understanding about the region's capacity for storing carbon dioxide as one way of addressing global climate change - or global warming as it is often called.

Addressing Global Climate Change

Scientists believe that carbon dioxide is the most common of the man-made greenhouse gases. Ohio is at the forefront of efforts, nation wide, to find ways to reduce the emissions of carbon dioxide. These emissions are a primary by-product of burning fossil fuels on which our regional economy depends. Steps to limit emissions are currently under discussion in Congress and it will be important for our state to develop technologies ahead of any regulations that are likely to be imposed.

One promising technology being explored is geologic sequestration - permanently storing carbon dioxide deep underground in carefully selected geologic formations. Suitable formations for storage include saline or brine (saltwater) reservoirs that are located thousands of feet below freshwater zones. Studies to date show that Ohio is naturally blessed with these formations that could potentially store and seal carbon dioxide safely in place after it is captured from power plants, or other industrial sources, and injected in the ground.

Why was the Tuscarawas Site Selected?

Geologists from ODNR and Battelle Memorial Institute also studied sites in Carroll and Meigs counties. They selected the Salem Township site because its geology is representative of the largest portion of eastern Ohio, in an area where no wells that have been drilled this deep, and could therefore contribute most to building our regional knowledge. Also, the geologic sections of interest for storing and containing carbon dioxide are between 2,500 and 9,000 feet deep, which is a cost-effective depth for drilling.

What will the Project Involve?

This is a research project that will involve drilling a well to a depth of about 8,600 feet and conducting a series of tests in the well. No carbon dioxide injection is planned.

Planning for site access began early in 2007. Drilling is scheduled to begin in May or June, 2007. A permit to drill is pending from the ODNR Division of Mineral Resources Management. The entire project, including analysis of the data that is gathered, is scheduled for completion by mid-2008.

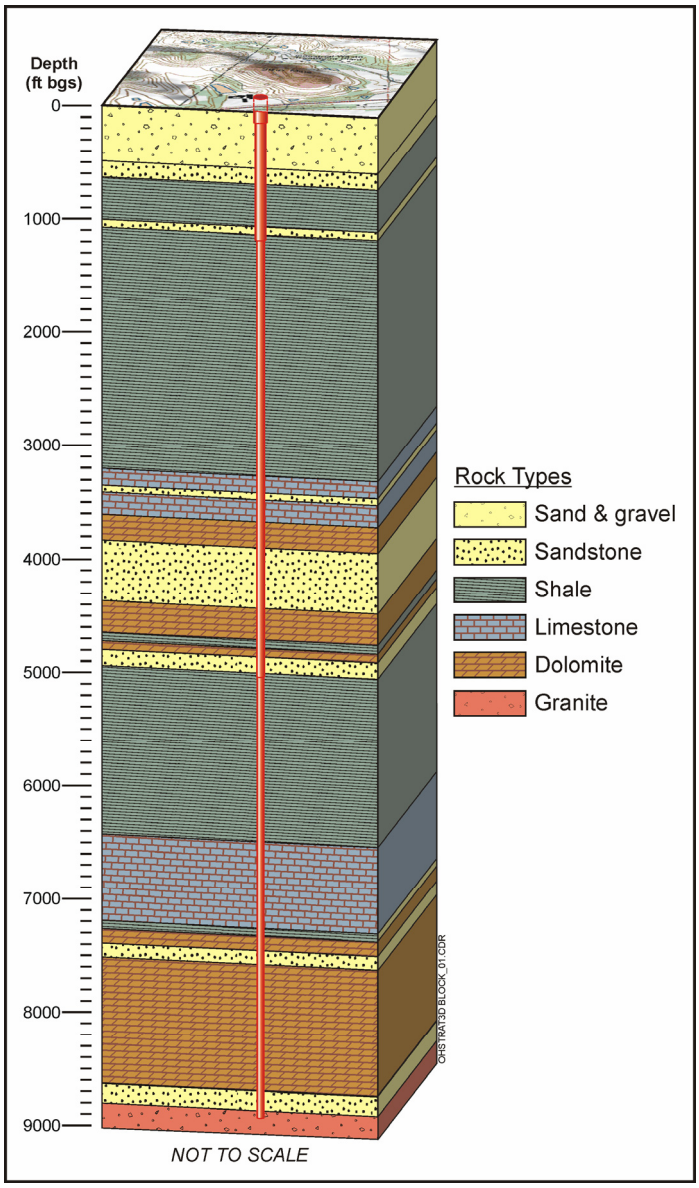

Figure 1. Subsurface Rock Formations

After drilling, the project research team will conduct a series of tests to find out more about the nature of the rocks deep underground and how much carbon dioxide they could potentially store. The tests will use a variety of tools to measure rock properties and gather information on subsurface conditions. If possible, the team will also take actual samples of the rocks (core samples) to further test and help calibrate the other measurements.

The team will look especially for two types of rock formations located far below the surface and drinking water supplies. They will first look for rock formations such as sandstone that are permeable and contain pore spaces that will allow the carbon dioxide to spread gradually into the formation over many years. They will also look for low-permeability rocks above them, such as shale. These layers would form what is called the caprock, which will seal the carbon dioxide in place and prevent it from moving upward to the surface. Together, these kinds of rocks would trap the carbon dioxide in place, much like oil and gas deposits remain trapped for millions of years. The different rock types are shown in Figure 1.

If you need more information:

All data will be available to the public on the ODNR web site at **ohiodnr**.com/geosurvey and via reports to be published by the ODNR. For more information about the test, contact:

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The Midwest Regional Carbon Sequestration Partnership (MRCSP) web site also includes information about climate change and ongoing carbon sequestration work in Ohio and the region, at www.MRCSP.org.