

**Evaluation of Coalbed Methane Potential and Gas Adsorption Capacity in the Western Kentucky Coalfield**, Sarah M. Mardon, Department of Earth and Environmental Sciences, University of Kentucky, Lexington, KY 40506-0053, smmard0@uky.edu; Kathryn G. Takacs and Cortland F. Eble, Kentucky Geological Survey, University of Kentucky, Lexington, KY 40506-0107, ktakacs@uky.edu, eble@uky.edu; James C. Hower, Center for Applied Energy Research, University of Kentucky, 2540 Research Park Dr., Lexington, KY 40511-8433, hower@caer.uky.edu; and Maria Mastalerz, Indiana Geological Survey, Indiana University, 611 North Walnut Grove, Bloomington, IN 47405-2208, mmastale@indiana.edu

The Illinois Basin has not been developed for coalbed methane (CBM) production. It is imperative to determine both gas content and other parameters for the Kentucky portion of the Illinois Basin for exploration and production to occur in this area.

This research is part of a larger project conducted by the Kentucky Geological Survey to evaluate the CBM production of Pennsylvanian-age western Kentucky coals in Ohio, Webster, Hopkins, and Union Counties using methane adsorption isotherms, direct gas desorption measurements, and chemical analyses of coal and gas. This research investigates relationships between CBM potential and petrographic, surface area, pore size, and high pressure gas adsorption isotherm analyses of the coals. Maceral and reflectance analyses are conducted at the Center for Applied Energy Research. Surface area and pore size of the coals are analyzed using a Micrometrics ASAP 2020, and the CO<sub>2</sub> high pressure isotherm analyses are conducted using a volumetric adsorption apparatus in a water temperature bath.

The aforementioned analyses are used to determine site-specific correlations for the Kentucky part of the Illinois Basin. The data collected is compared with previous work in the Illinois Basin and correlated with data and structural features in the basin. Gas composition and carbon and hydrogen isotopic data suggest mostly thermogenic origin of coalbed gas in coals from Webster, Hopkins, and Union Counties, Kentucky, in contrast to the dominantly biogenic character of coalbed gas in Ohio County, Kentucky.