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## **Black Mesa Coal Basin, Northeastern Arizona: An overlooked Rocky Mountain coalbed methane play**

The 3,300-mi<sup>2</sup> Black Mesa Basin in the Colorado Plateau of northeastern Arizona contains extensive coal resources and resembles successful coalbed methane (CBM) settings in the nearby San Juan and Raton Basins. Yet its CBM potential has never been tested. Two new gas pipelines will soon cross near this isolated basin, improving market access. Based on evaluation of surface and subsurface data, we estimate the basin contains approximately 15 Tcf of CBM resources at prospective depths (<3,000 ft).

The Cretaceous Mesaverde Group provides three CBM targets. The thickest is the Wepo Fm, with up to 60 feet of coal, while the underlying Toreva and Dakota Fms contain an additional 10 to 50 feet. Wepo coals are high-volatile bituminous (12,400 Btu/lb; dry basis). Toreva and Dakota coals are lower in rank at outcrop, but may increase to bituminous levels below 2,000 feet. Structure is favorably simple, with gently dipping strata interrupted by broad Laramide-age folds that were formed over Laramide or reactivated Precambrian basement faults.

CBM development in the Black Mesa Basin faces several challenges. Erosion has cut deep canyons, locally exposing and possibly degassing the Wepo and Toreva coals. However, the lowermost Dakota coals are not exposed and, as in the Raton Basin, the Black Mesa has extensive uneroded plateaus where coals remain buried and may be gas saturated. A low-cost corehole test program is needed to measure gas content, permeability, and other key reservoir properties and further define the producibility of CBM resources in the Black Mesa Basin.