They are in order, from northeast to southwest, the Fulton, Mouth of Seneca, and Augusta depositional systems. The relatively brief time interval of Minnehaha deposition by three separate depositional systems strongly suggests a sea-level drop in the Appalachian basin as a causal factor. The overlapping of submarine fan deposits from three depositional systems could enhance the hydrocarbon reservoir potential of the Minnehaha member. The Minnehaha member may be the shoreward correlative of the gas productive Sycamore siltstone of north-central West Virginia.

MILLER, DAN, Assistant Secretary of the Interior for Energy and Minerals, U.S. Dept. Interior, Washington, D.C.

Exploration: Key to America's Energy and Mineral Policies

The current goals and objectives of the Department of the Interior have been formulated to support and assist the Reagan administration's overall program and to return balance to the management of the public lands.

The federal government's proper role is to insure that private enterprise has access to energy and mineral resources within the context of its responsibilities for protection of the environment. The Department of the Interior is formulating policies designed to: encourage exploration as a guarantee of adequate, accurate geologic data of the mineral resources of the nation; reduce excessive and unnecessary regulations, thereby encouraging increased responsibility and competition on the part of private enterprise; implement wise multiple use of the public lands; reduce this nation's reliance on foreign sources of strategic minerals.

MILLER, MARSHALL S., Geological Consulting Services, Inc., Bluefield, VA

Predictive Geological Mapping of Mining Conditions in Appalachian Coal Fields

Recent case histories in the Appalachian region incorporating active mining operations with detailed geological hazards mapping prior to mining have confirmed the importance of certain geological techniques and applications. Applying these techniques to active operations in Pennsylvania, Maryland, West Virginia, southwest Virginia, and eastern Kentucky demonstrates that certain of these geological factors can be related to mining on a regional basis. Some of the applications involve the identification of weak, fractured rock zones underground through use of high-altitude satellite imagery. The simple procedure of intensity or the magnitude rating of the linear features appears to be the real key in identifying hazardous roof areas prior to mining. Composite and overlay mapping of significant, anticipated geological factors is the most important application to identifying safe, high-production mining areas as opposed to hazardous, low production mining. Again, it is necessary to apply rating factors to each potential problem and to design a presentation technique that can achieve simplicity and workability from a multitude of complex geological factors.

Although local or on-site physical and geological conditions largely dictate mining conditions, understanding and identification of regional geology and paleodepositional environments greatly enhance the more important ability to predict hazards prior to mining. Additional benefits derived from applying geologic hazards mapping are (1) identification of significant hydrologic factors which must be considered in meeting state and federal requirements for ground-water monitoring, and (2) establishment of confidence levels for coal reserve classifications.

NELSON, BRADFORD E., and ALAN H. COOGAN, Kent State Univ., Kent, OH

Lithofacies of Subsurface "Packer Shell" (Brassfield Limestone-Rochester Shale) Interval in Eastern Ohio

The interval between the subsurface "Clinton" (Medina) sandstone in Ohio and the base of the Niagaran dolomite was mapped using geophysical logs and samples over an area of 37 counties in eastern Ohio. The density of control approximated 1 well per 5 mi^2 (13 km^2) over the 23,640 mi^2 (61,228 km^2) studied. Between the "Clinton" sandstone and the Niagaran dolomite, the limestones and dolomites of the "Packer Shell," "Casing Shell," and other carbonate rock units are interbedded with shales called the Rochester in Ohio. On logs, the differentiation between the limestone or dolomite and shale was based on greater than 50% gamma-ray deflection and the density log readings.

Lithologically, the "Packer Shell" is a gray to dark gray, dense crystalline bioclastic limestone and/or dolomite. The Brassfield Limestone on the outcrop includes glauconitic oolitic grainstones, glauconitic molluscan crinoidal packstones with chert, and glauconitic bioturbated mudstones to wackestones. The "Casing Shell" and other carbonate units in the Rochester are gray to dark gray and contain bioclasts. At the base of the "Packer Shell" is a distinctive red, hematitic shale which is present over 65% of the area.

Regional cross sections show the three to four main carbonate units interbedded with shale in eastern Ohio. These carbonate rocks maintain their approximate individual thicknesses as the interbedded shales thin west and southwestward until the "Casing Shell" merges with the "Packer Shell" to form the unbroken stratigraphic unit recognizable on the outcrop as the Brassfield Limestone in southwestern Ohio.

The shale interbeds are thickest in east-central and southeast Ohio where they average 110 and 170 ft (33 and 52 m) thick, respectively, indicating the possible source direction for the shale influx from the east and southeast.

Correlations indicate a transgression of the Brassfield-"Packer Shell"-"Casing Shell" units so that the carbonate rocks appear to climb eastward in the section with respect to a datum at the base of the "Packer Shell." In Ohio, on the outcrop, the Brassfield Limestone is dated as Silurian, Albion, although part of its lithostratigraphic equivalents—the "Casing Shell" and other Rochester Shale carbonate beds—are Niagaran.

The "Packer Shell" is a useful unit on which to base a structural map, if care is taken at the critical locations of facies changes. The "Packer Shell" is porous locally and is reported to produce gas from some wells in Ohio. The production appears to be related to the occurrence of small structural noses, possibly associated with fracturing above the "Clinton" sandstone reservoir.

O'ROURKE, JOHN E., and PAMELA H. REY, Woodward-Clyde Consultants, San Francisco, CA

Effect of Discontinuities on a Room-and-Pillar Coal Mine Plan

The highest safe extraction ratio is the goal of coal mine planning. This may be affected substantially by the interaction of regional in-situ stress with coal-measure discontinuities such as faults, interbedded weak and strong strata, rolls, and sandstone channels. The effect of discontinuities is to interrupt or concentrate the mechanics of stress transfer and cave development during coal extraction, often resulting in a costly change in mining plan. Heavy ground conditions were encountered when extracting pillars during retreat in a room-and-pillar panel at a mine in central Utah, resulting in the decision to bypass about 25% of the coal within the panel.

Conditions which led to abandonment of the central portion of the