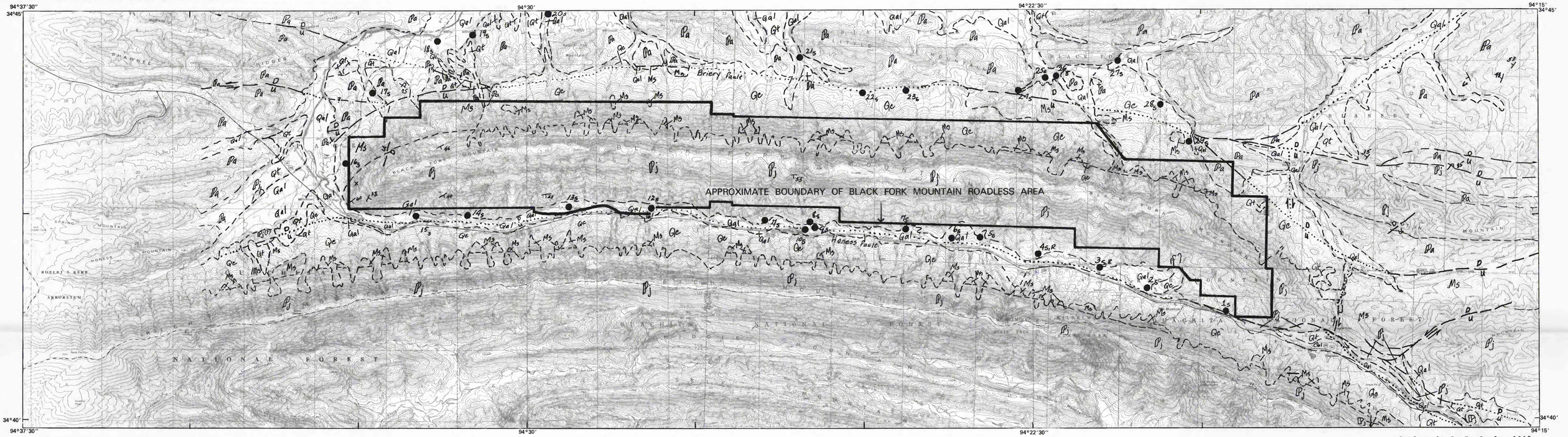
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1599
PAMPHLET ACCOMPANIES MAP



Base from U.S. Geological Survey, 1:24,000
Page, 1981; Mountain Fork, 1958; Rich Mountain, 1979PR

SCALE 1:50 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

Geology by D. R. Seely, 1963; modified by M. H. Miller, 1982

CORRELATION OF MAP UNITS

Qal, Qc, Qt		QUATERNARY
UNCONFORMITY		
Pa	Atokan	PENNSYLVANIAN
Pj	Morrowan	
Ms		MISSISSIPPIAN

DESCRIPTION OF MAP UNITS

- Qal — ALLUVIUM (QUATERNARY)--Gravel, sand, and clay of stream floodplains
- Qc — COLLUVIUM (QUATERNARY)--Sandstone, quartz sand, and clay on slopes
- Qt — TERRACE DEPOSITS (QUATERNARY)--Sand and gravel on terraces above present floodplain
- Pa — ATOKA FORMATON (PENNSYLVANIAN, ATOKAN)--Light-gray, laminated to very thick bedded sandstones, some fossiliferous; interbedded with gray shale. Thickness about 6,000 ft
- Pj — JACKFORK SANDSTONE (PENNSYLVANIAN, MORROWAN)--Gray shale interbedded with sandstone and carbonaceous sandstone layers. Thickness about 5,600 ft
- Ms — STANLEY SHALE (MISSISSIPPIAN)--Gray and olive-gray sandstone and shale. Thickness about 1,400 ft

EXPLANATION

- CONTACT--Dashed where inferred
- FAULT--Dashed where inferred; dotted where concealed; queried where uncertain; D, downthrown side; U, upthrown side
- R,S — SAMPLE LOCALITY--R, rock; S, stream sediment
- STRIKE-SLIP COMPONENT ALONG FAULT

STRIKE AND DIP OF BEDDING

- 56 — Inclined
- 85 — Overturned
- X — INACTIVE IMPSONITE MINE--Approximate location

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Black Fork Mountain Roadless Area (08084) in the Ouachita National Forest, Polk County, Ark., and Le Flore County, Okla. The Black Fork Mountain Roadless Area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

MINERAL RESOURCE POTENTIAL SUMMARY STATEMENT

The Black Fork Mountain Roadless Area has a high potential for building stone, crushed rock, and clay for brick making from the Jackfork Sandstone and the Stanley Shale. Both formations crop out in the roadless area.

The potential for gas and oil cannot be verified at present, but some investigators believe that conditions in the subsurface may be favorable for presence of some gas and oil in this area (C. G. Stone, Arkansas Geological Commission, oral commun., 1983).

INTRODUCTION

The Black Fork Mountain Roadless Area (see index map) is in the northern part of the Ouachita Mountain province in the Ouachita National Forest, Polk County, Ark., and Le Flore County, Okla. The roadless area covers about 8,100 acres about 45 mi south of Fort Smith and about 10 mi northwest of Mena, Ark.

On the south, access is via U.S. Highway 270; on the north, access is by U.S. Forest Service and privately owned roads. Nearly all the roadless area is densely timbered by shortleaf pine and hardwoods. Elevation in the roadless area ranges from about 940 ft near the western boundary to 2,660 ft on the ridgetop near the eastern boundary.

Black Fork Mountain is an east-west trending ridge along the north flank of the Eagle Gap syncline. The Honess fault bounds the roadless area on the south, and the Briery fault bounds it on the north.

According to the U.S. Forest Service, about 8,050 acres in the roadless area are leased for oil and gas.

GEOLOGY

Stratigraphy

Quaternary alluvium, colluvium, and terrace deposits cover floodplains, some slopes, and perched terraces. Formations that crop out in the roadless area are the Pennsylvanian Atoka Formation and Jackfork Sandstone and the Mississippian Stanley Shale (Seely, 1963).

Structure

The Eagle Gap syncline is the major structure in the Black Fork Mountain Roadless Area. The Honess fault, parallel to Big Creek, cuts the Jackfork Sandstone and the Stanley Shale near the southern boundary of the roadless area. Movement along this fault was principally dip slip, but most probably included a strike-slip component. Stratigraphic displacement may range from 5,000 to 7,000 ft (Seely, 1963). Along the north side of the roadless area, the Briery fault parallels Briery Creek for a short distance. The dip of this fault is about 55° south. Along this fault trace, the Atoka Formation is in contact with the Stanley Shale. According to Seely (1963), the maximum stratigraphic displacement along the Briery fault could be as much as 25,000 ft. The Honess and Briery faults are high-angle thrusts (Seely, 1963). Both the Briery and Honess faults are covered with alluvium or colluvium in most places.

GEOCHEMISTRY

Spectrographic analyses of stream-sediment and rock samples from the Black Fork Mountain Roadless Area do not indicate any surface areas of highly anomalous metal content. Zinc content of sample 1 (1,000 ppm) is higher than background values (200 ppm). Although no evidence of contamination was noted, this higher value may be the result of contamination by a manufactured product having a high zinc content. At any rate, the high zinc content of this one sample is not considered significant.

GEOPHYSICS

No detailed magnetic or gravimetric surveys have been made of the roadless area. A Bouguer gravity map of Arkansas (Hendricks and others, 1981) shows a gravity low on Rich Mountain, immediately south of the roadless area. This low probably is associated with the Ouachita Mountain negative gravity anomaly centered in northern Pushmataha County, Okla. Lyons and others (1964) interpreted this anomaly to be the result of a great thickness of sediments. Magnetic and gravimetric maps of Oklahoma were compiled by Lyons and others (1964). A gravity and magnetic high about 10 mi northwest of the Black Fork Mountain Roadless Area, called the Heavener maximum, is interpreted by Lyons and others (1964) as stongly suggesting a batholith at great depth. The magnetic and gravity high is about 10 mi northwest of the Black Fork Mountain Roadless Area.

MININC DISTRICTS AND MINERALIZATION

No mining districts are in or adjacent to the Black Fork Mountain Roadless Area. Impsonite, a nearly infusible asphaltic pyrobitumin having a high fixed-carbon content, was mined from a deposit in the NE ¼ SE ¼ sec. 23, T. 3 N., R. 26 E., about 1 mi east of Page, Okla. This deposit was worked for fuel on a small scale prior to 1911, but most of the impsonite was mined during World War I for its vanadium content. The impsonite is present in fissures and along bedding planes in the Jackfork Sandstone (Ham, 1956). The Page deposit may still contain a small amount of impsonite, but other sources of vanadium make it unlikely that this deposit will be productive again. Solid bitumin is present near Eagle Gap, near the eastern boundary of the roadless area. Devolatilization of crude oil along fractures or faults probably produced the bitumin (Reinemund and Danilchik, 1957).

Coal crops out in two places in and near the roadless area; however, the seams are thin (2-4 in.) and of small areal extent (Stroud and others, 1969). It appears unlikely that coal could be mined from either occurrence.

Sand and gravel and sandstone within the roadless area probably are suitable for aggregate and road ballast. Shale in the roadless area may be suitable for brick making. Sandstone and shale in the Jackfork Sandstone and Stanley Shale have a high potential for such uses.

Nearly all land in the Black Fork Mountain Roadless Area is under lease for oil and gas. Although potential for gas and oil in the Black Fork Mountain Roadless Area cannot be verified at present, some investigators believe there may be some probability for the occurrence of gas and oil resources in this region in rocks of Arbuckle age (Cambrian and Ordovician) or younger (Stone, C. G., oral commun., 1983).

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Although impsonite in the roadless area has been mined for its vanadium content, there appears to be little or no likelihood of further production of vanadium from the Page deposit.

Coal is present in the roadless area, but the extent is very small. There is no likelihood of coal production from the Black Fork Mountain Roadless Area.

Shale, sandstone, and clay in the roadless area are suitable for construction materials. The Jackfork Sandstone and the Stanley Shale contain rock that meets specifications for construction purposes. There is a high potential for resources of stone and crushed rock in the Black Fork Mountain Roadless Area.

Some investigators believe that the Black Fork Mountain region may have moderate potential for the occurrence of gas and oil resources (C. G. Stone, oral commun., 1983). Deep exploratory drilling would be necessary to determine possible gas and oil potential in the roadless area.

REFERENCES CITED

Ham, W. E., 1956, Asphaltite in the Ouachita Mountains: Oklahoma Geological Survey Mineral Report 30, 12 p.

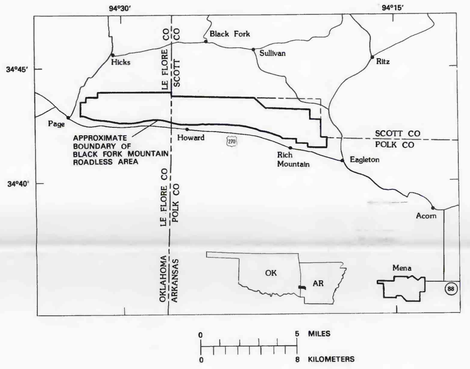
Hendricks, J. D., Keller, G. R., and Hildenbrand, T. G., 1981, Bouguer gravity map of Arkansas: U.S. Geological Survey Geophysical Investigations Map GP-944, scale 1:500,000.

Lyons, P. L., Jones, V. L., and Jacobsen, Peter, Jr., 1964, Vertical-intensity magnetic map and Bouguer gravity-anomaly map of Oklahoma (Text to accompany Map GM-6 and Map GM-7): Oklahoma Geological Survey, 15 p. [in envelope with text are Map GM-6 by V. L. Jones and P. L. Lyons and Map GM-7 by P. L. Lyons].

Reinemund, J. A., and Danilchik, Walter, 1957, Preliminary geologic map of the Waldron quadrangle and adjacent areas, Scott County, Arkansas: U.S. Geological Survey Oil and Gas Investigations Map OM-192, scale 1:48,000.

Seely, D. R., 1963, Structure and stratigraphy of the Rich Mountain area, Oklahoma and Arkansas: Oklahoma Geological Survey Bulletin 101, 173 p.

Stroud, R. B., Arndt, R. H., Fulkerson, F. B., and Diamond, W. G., 1969, Mineral resources and industries of Arkansas: U.S. Bureau of Mines Bulletin 645, 418 p.



INDEX MAP SHOWING LOCATION OF THE BLACK FORK MOUNTAIN ROADLESS AREA (08084)

MINERAL RESOURCE POTENTIAL AND GEOLOGIC MAP OF THE BLACK FORK MOUNTAIN ROADLESS AREA, POLK COUNTY, ARKANSAS, AND LE FLORE COUNTY, OKLAHOMA

By

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1983

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