DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
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PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF KENTUCKY, UNIVERSITY OF KENTUCKY
KENTUCKY GEOLOGICAL SURVEY
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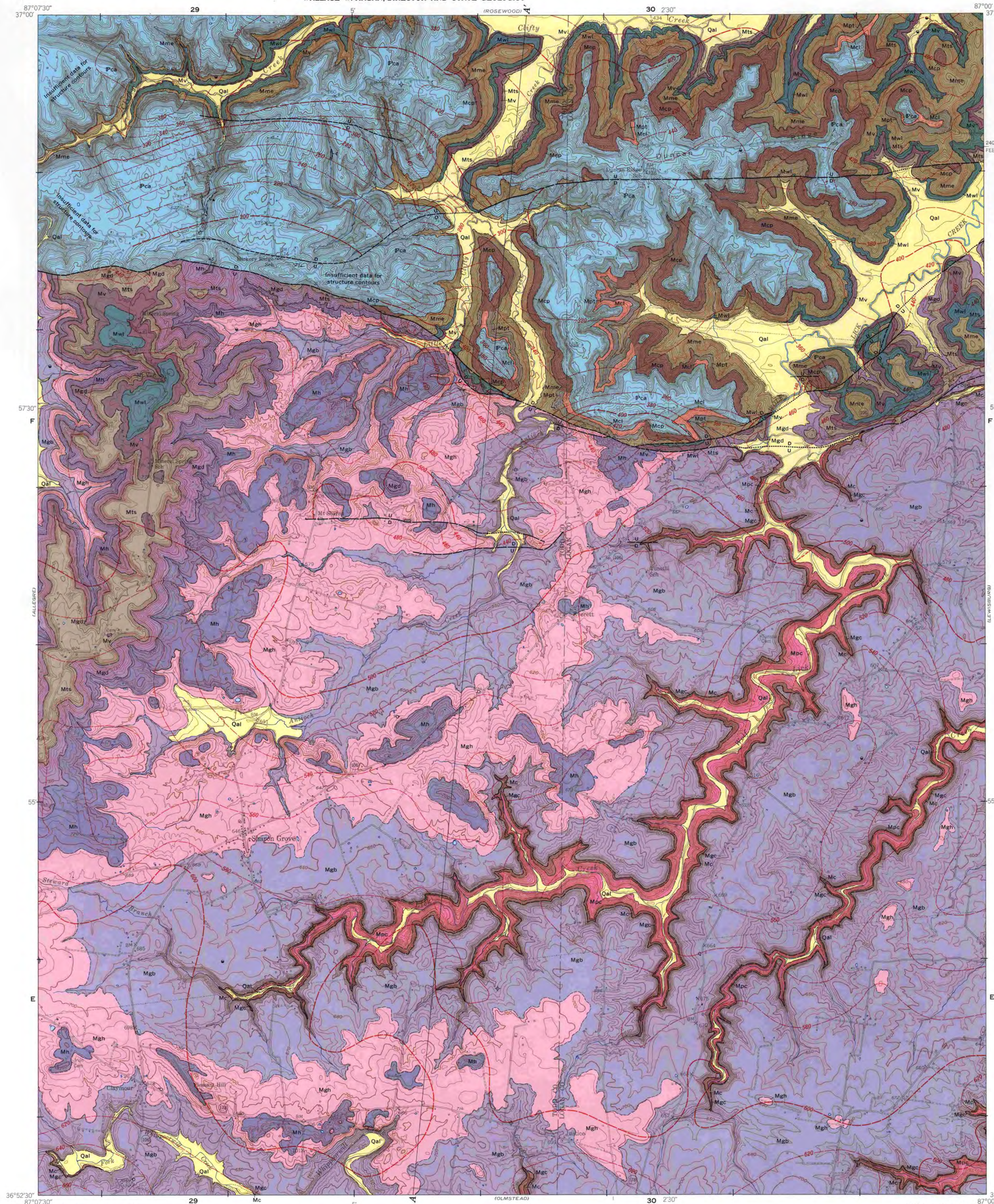
GEOLOGIC QUADRANGLE MAP
SHARON GROVE QUADRANGLE, KENTUCKY
GQ-482

SYSTEM	SERIES	FORMATION AND MEMBER	LITHOLOGY	THICKNESS IN FEET	DESCRIPTION
QUATERNARY		Alluvium		0–20	Sand, silt, gravel, and clay: unconsolidated and poorly sorted; averages less than 10 feet thick except in wide flood plains.
PENNSYLVANIAN	Lower Pennsylvanian	Caseyville Formation		0–220+	Sandstone, shale, and coal: Sandstone, brown and light-brown with dark ferruginous banding along crossbedding, fine- to medium-grained; iron oxide and clay cement, locally quartzitic; forms prominent bluffs along Clifty Creek. Shale, sandy, brown; beds 5 to 10 feet thick, poorly exposed between massive sandstone ledges. Plant fossils abundant as casts and molds. Coal, 2 to 3 feet thick, estimated to be about 150 feet above base of formation; occurs in two exposures and is penetrated by several water wells in northwestern part of quadrangle.
				300+	Sandstone, conglomerate, siltstone, and clay: Sandstone, brown, yellowish-brown, and white, massive, cliff-forming; contains iron-oxide-cemented concretions and has honeycombed appearance on weathered faces; silty units less well exposed. Friable white sandstone, very fine grained, about 20 feet thick; occurs in lower 50 to 100 feet; gray and ferruginous thinly crossbedded sandstone above and below. Conglomerate and sandstone, fine- to coarse-grained with well rounded quartz pebbles ½ to 2 inches in diameter, crossbedded; commonly underlain by yellow clay and dark-brown siltstone or thin-bedded ripple-marked sandstone. Base of formation rests on a widespread unconformity marked locally by varieties of uniformly coarse chert conglomerate (some ferruginous and calcareous, or clay rich) and very coarse limestone conglomerate, containing angular and rounded limestone pieces 3 to 10 inches in diameter set in a matrix of chert and limestone granules with calcareous cement. The unconformity truncates older rocks progressively westward and locally forms channels which cut out the higher Mississippian formations within short distances.
MISSISSIPPIAN	Chester	Clore(?) Limestone		0–60	Shale, limestone, and sandstone: Shale, grayish-green to dark-green; interbedded with limestone; poorly exposed. Limestone, light-yellow and yellowish-brown, fine-grained, silty, thin-bedded, dolomitic; locally, gray fine- to medium-grained massive beds several feet thick occur near base. Sandstone, yellow, calcareous, porous where weathered; about 5 feet thick; occurs in upper part of unit. Upper and lower contacts of formation are indistinct due to poor exposures. Formation is mapped with underlying Palestine(?) Sandstone except where basal limestone ledge of Clore(?) Limestone is well exposed.
		Palestine(?) Sandstone		0–105 / 0–50	Sandstone, shale, and limestone: Sandstone, brown, fine-grained, poorly exposed; interbedded with shale, thin limestone, and siltstone. Shale, green and brown, sparsely exposed. Limestone, yellowish-brown, fine-grained, dolomitic; occurs as discontinuous lenses.
		Menard Limestone		0–4	Dolomite, brown to grayish-brown, fine-grained; occurs as distinctive thin ledge where present.
				0–20	Shale, green and dark-gray, calcareous and silty; poorly exposed and locally absent.
				0–30	Limestone, gray to medium-brown; weathers gray, fine to medium grained; upper ledge 3 feet thick, commonly fossiliferous; overlies argillaceous limestone 6 to 10 feet thick. Lower 15 to 20 feet consists of limestone, gray, medium-grained, massive; locally slightly oolitic; contains thin gray shale interlayers.
				20–115 / 5–20	Limestone and shale: Limestone, yellowish-brown, fine-grained, silty, slightly dolomitic; poorly exposed interval about 10 feet thick overlies persistent very thinly bedded limestone unit 2 to 3 feet thick at 35 to 40 feet above base of formation. Shale, light- to medium-gray, above and below limestone.
				15–25	Limestone, dark-gray; weathers chalky gray, fine to medium grained, thick bedded; slightly dolomitic toward base; contains some thin beds of brown and blue chert. Gastropods and silicified crinoid stems are generally present. Forms prominent ledges and weathers out as large blocks.
		Waltersburg Formation		20–40	Shale and sandstone: Shale, gray, green, and dark-brown, silty, poorly exposed. Sandstone, brown to dark-brown, fine-grained; discontinuous beds 1 to 4 inches thick weather out as elongate, wedge-shaped blocks.
		Vienna Limestone		10–30	Limestone and chert: Limestone, light-yellowish-brown and gray, medium- to coarse-grained, commonly oolitic; mottled yellowish-brown dolomitic bed about 3 feet thick occurs near top. Chert, nodular and bedded; weathers to light-colored rectangular and wedge-shaped blocks, rough-surfaced due to fossil fragments. Forms persistent ledge on slopes.
		Tar Springs Sandstone		10–60	Sandstone, siltstone, and shale: Sandstone, light-brown to gray, fine- to medium-grained, micaceous, medium- to thick-bedded, slightly crossbedded; clay and silica cement; commonly fucoidal on bedding planes. Siltstone and shale, dark-gray, green, and black, poorly exposed. Formation thins eastward as sandstone grades into siltstone and shale.
		Glen Dean Formation		55–100	Limestone, shale, and sandstone: Limestone, light- to medium-gray and brown; weathers gray, medium to coarse grained, thin to thick bedded, fossiliferous; commonly contains detrital quartz. Upper 5 feet generally oolitic. Formation typically has ledge-forming beds of limestone at top and base; intervening shale, limestone, and thin irregular beds of sandstone generally concealed. Limestone in middle unit locally attains a thickness of 25 feet. It is dolomitic in basal part and crossbedded at the top.
		Hardinsburg Sandstone		20–65	Sandstone and shale: Sandstone, yellowish- to greenish-brown; weathers orange brown, fine to coarse grained; cemented by clay and/or) calcite; weakly crossbedded toward base where sandstone becomes calcareous and fossiliferous; contains mica, pyrite, and pyritic nodules. Shale, gray, calcareous; occurs commonly at top and bottom of formation.
		Goloconda Formation: Haney Limestone Member		35–60	Limestone and shale: Limestone, medium- to dark-grayish-brown, medium- to coarse-grained; sandy at top, fossiliferous throughout. Formation characterized by uniform thin to medium bedding of limestone and presence of an oolitic limestone bed 1 to 10 feet thick at or near the base. Shale, gray, calcareous; forms partings between limestone beds. Rectangular-shaped fragments and irregular nodules of yellowish-brown fossiliferous chert form a thin residuum which, in much of the mapped area, is all that remains of the formation. Irregular thinning of the formation on gentle slopes is due to near-surface solution and collapse.
		Big Clifty Sandstone Member		90–155 / 50–115	Sandstone, shale, and siltstone: Sandstone, brown, red and yellowish-gray, fine- to medium-grained. Upper part of member is sandstone and sandy shale interbedded with red shale and siltstone and, locally, thin gray shale beds. Lower part of member is massive honeycombed, commonly crossbedded sandstone interlayered with argillaceous siltstone and shale; it forms the upper valley walls in the southern part of the quadrangle. Ripple marks, brachiopod and bryozoan casts, and calcareous cement increase toward the base. A few plant fossils occur in lower part of member. Greenish-gray shale 5 to 10 feet thick at top of member is poorly exposed. Dark-gray, partly calcareous shale occurs at base and ranges in thickness from less than 1 foot to 15 feet.
		Beech Creek Limestone Member		1–10	Limestone, brown or gray, medium- to coarse-grained; thin fossiliferous sandy limestone bed commonly at top. Brachiopods, probably *Juliella inflata* (McChesney), are abundant at locality 1.5 miles southwest of Spa. Unit is marked by gray shale above and green shale below. Generally less than 5 feet thick.
		Cypress Formation		3–40	Shale, commonly dark-green with locally interbedded red shale; sparsely sandy and calcareous at base. Thickness varies irregularly; where less than 10 feet thick on steep slopes in southeastern part of quadrangle, formation is mapped as pinching out. Because of its lithology in this and adjoining quadrangles, the unit is here called Cypress Formation instead of Cypress Sandstone.
		Paint Creek Limestone		90+	Limestone and shale: Limestone, light- to medium-gray and grayish-brown, fine- to coarse-grained. Upper contact generally marked by massive ledge that is locally very chalky, contains pyrite, and has greenish cast when wet. Blocky oolitic beds about 5 feet thick occur at or near top and at 10- or 15-foot intervals below. Ripple-marked beds and an interval rich in brachiopods and solitary corals are locally present 10 to 25 feet below top. Broadly crossbedded argillaceous limestone about 10 feet thick occurs locally 55 feet below top. Shale, gray, calcareous; occurs as partings between thick limestone beds and in poorly exposed intervals about 5 feet thick. Base of formation not recognized in quadrangle.



Base by U.S. Geological Survey, 1952

The Carter Coordinate System letters and numbers used to designate five-minute divisions of latitude and longitude are shown along the margins; tick marks indicate one-minute divisions

Geology mapped in 1963–64

SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

KENTUCKY
QUADRANGLE LOCATION

APPROXIMATE MEAN DECLINATION, 1966

EXPLANATION

- Qal — Alluvium (QUATERNARY)
- Pca — Caseyville Formation; c, unnamed coal bed (Lower Pennsylvanian; PENNSYLVANIAN)

UNCONFORMITY

- Mcp / Mcl / Mpt — Clore(?) Limestone and Palestine(?) Sandstone, undivided; Mcl, Clore(?) Limestone; Mpt, Palestine(?) Sandstone
- Mme — Menard Limestone
- Mwl — Waltersburg Formation
- Mv — Vienna Limestone
- Mts — Tar Springs Sandstone
- Mgd — Glen Dean Formation
- Mh — Hardinsburg Sandstone
- Mgh — Haney Limestone Member
- Mgb / Mgc — Big Clifty Sandstone and Beech Creek Limestone Members; Mgb, Big Clifty Sandstone Member; Mgc, Beech Creek Limestone Member
- Mc — Cypress Formation
- Mpc — Paint Creek Limestone

(Goloconda Formation; Chester; MISSISSIPPIAN; CARBONIFEROUS)

240 FEET

Contact
Dashed where approximately located; short dashed where inferred, indefinite, or gradational; dotted where concealed

Coal bed
Dashed where inferred

Fault
Dashed where approximately located; short dashed where inferred; dotted where concealed. U, upthrown side; D, downthrown side

Strike and dip of beds
Generalized where no numerical value given

Structure contours
Drawn on base of Big Clifty Sandstone Member of Goloconda Formation south of large fault block; drawn on top of Glen Dean Formation in and north of fault block. Long dashed where control less accurate. Short dashed where datum is above land surface. Arrow indicates direction of dip. Hachures indicate closed basin. Contour interval 20 feet

DRILL HOLES FROM WHICH SUBSURFACE STRUCTURAL DATA WERE OBTAINED

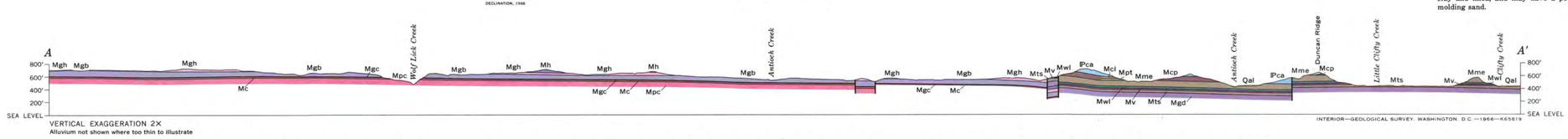
- Dry hole
- Show of oil
- Show of gas
- Water well
- Caved adit
- Fossil locality

ECONOMIC GEOLOGY

Development of mineral resources within the quadrangle has been limited to production of a small amount of coal from a bed 2 to 3 feet thick, which is exposed at two known localities in the northwestern part of the quadrangle. The coal was mined prior to 1939 in Copper Spring Branch where underground workings, now caved, reportedly extended 75 to 100 yards in from the outcrop.

The search for oil since 1943 has resulted in 22 known drill holes, 10 of which penetrated the Chattanooga Shale of Late Devonian age. Most of the shallow holes bottomed in rocks of the Chester Series and were not drilled with regard to structural highs based on surface mapping. Deeper drilling tested a few of the small structural highs and the areas on either side of the down-dropped block in the northern part of the quadrangle. Shows of oil and gas have been reported in the Big Clifty Sandstone Member (Jackson sand) of the Goloconda Formation and in the Paint Creek Limestone which are exposed in the quadrangle; in the Ste. Genevieve, St. Louis, and Warsaw Limestones of Late Mississippian age, which are not exposed in the quadrangle; and in thin sandstone and shale breaks below the Chattanooga Shale.

Quartz sandstone, white and very fine grained, occurs in an even-bedded layer about 20 feet thick, 50 to 100 feet above the base of the Caseyville Formation in and west of the Duncan Ridge area. It is friable and contains minor amounts of white clay and mica, and may have a potential value as glass or molding sand.



VERTICAL EXAGGERATION 2×
Alluvium not shown where too thin to illustrate

GEOLOGIC MAP OF THE SHARON GROVE QUADRANGLE, TODD AND LOGAN COUNTIES, KENTUCKY

By
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1966

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