

Mapped, edited, and published by the Geological Survey
in cooperation with the Oklahoma Highway Department,
Oklahoma Water Resources Board, and Oklahoma State Soil
Conservation Board

UTM GRID AND 1983 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:24,000

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

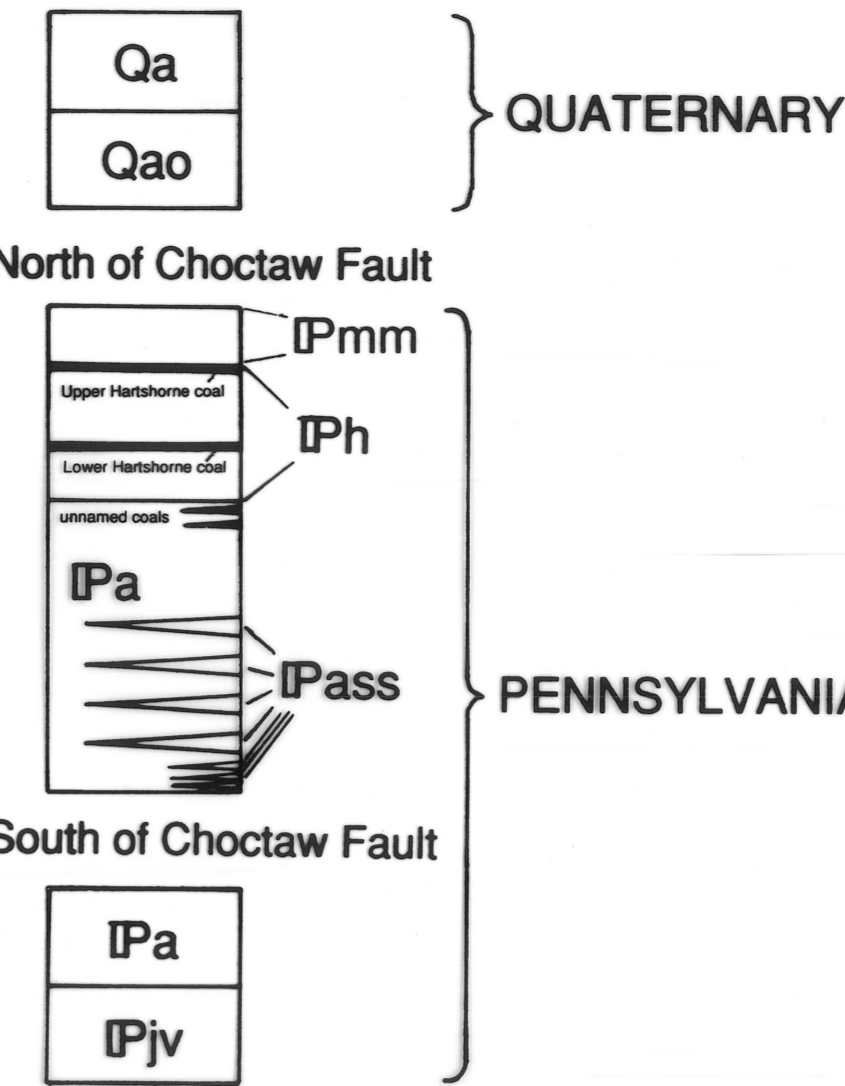
ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Interstate Route
U. S. Route
State Route

Geology by Colin Mazengarb and LeRoy A. Hemish, 1991

This map has been prepared as part of the U.S. Geological Survey Cooperative Geologic Mapping Program (COGEMAP).

CORRELATION OF MAP UNITS



SYMBOLS

- CONTACT--Dashed where approximately located; ticks show terrace slopes
- COAL BOUNDARY--Approximate outcrop boundary of coal bed (named on map); triangle indicates exposure of coal; queried where questionable
- MARKER BED
- THRUST FAULT--Sawtooth on upper plate; dashed where approximately located; dotted where concealed; queried where questionable
- NORMAL FAULT--Hachures on apparently downthrown side
- FAULT--Inferred, sense of offset unknown
- FAULT--Arrows show relative horizontal movement; dashed where approximately located; dotted where concealed; queried where questionable
- ANTICLINE--Showing crestline, arrow shows direction of plunge if determined; dashed where approximately located; dotted where concealed; queried where questionable
- SYNCLINE--Showing troughline, arrow shows direction of plunge if determined; dashed where approximately located; dotted where concealed; queried where questionable
- OVERTURNED ANTICLINE--Showing crestline; limbs diverge in direction of arrows; dashed where approximately located; dotted where concealed
- OVERTURNED SYNCLINE--Showing troughline; arrows show direction of convergence of limbs; dashed where approximately located; dotted where concealed; queried where inferred
- MINOR ANTICLINE--Showing direction and amount of plunge if determined
- MINOR SYNCLINE--Showing direction and amount of plunge, if determined
- CONTORTED BEDS--Arrow shows direction of plunge where known
- MINED-OUT AREA
- OUTCROP DATA
 - Leader to location of measurement
 - Strike and dip of beds, facing direction unknown
 - Strike of beds, dip value unknown
 - Strike of beds, dip direction unknown
 - Vertical beds, facing direction unknown
 - Strike and dip of beds, upright
 - Vertical beds, ball indicates top of beds
 - Strike and dip of beds, overturned
 - Outcrop observed
 - Limestone or dolomite cobble or boulder in Johns Valley Formation
 - Siliceous shale bed in Atoka Formation
 - Facing (younging) direction, away from ball
 - Bedrock orientation projected onto section lines (cross-sections only)
- OIL AND GAS WELLS (Cross section Q-Q' only)
 - Dry hole, abandoned
 - Gas well

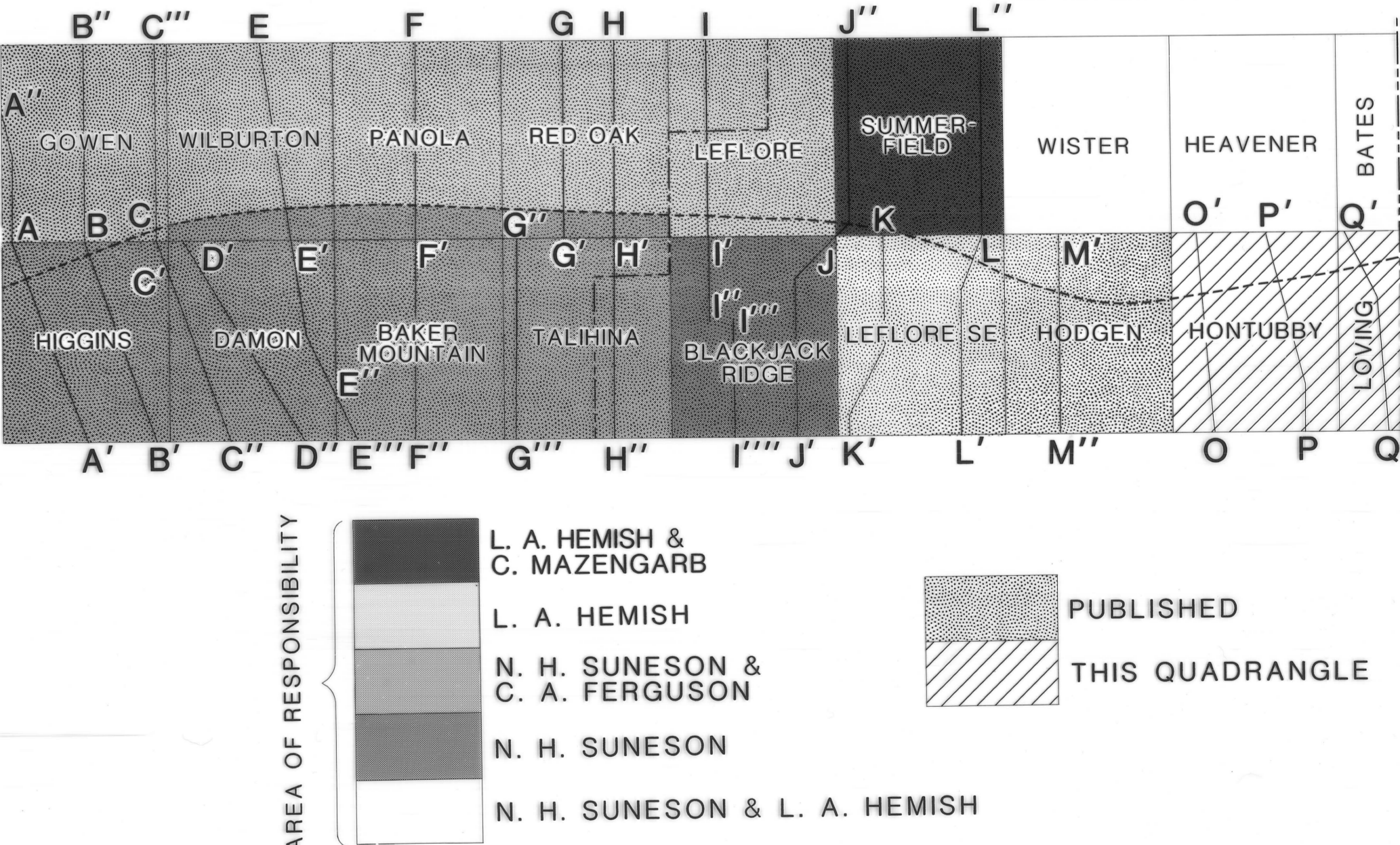
DESCRIPTION OF MAP UNITS

- Qa ALLUVIUM (QUATERNARY)--Gravel, sand, silt, and clay on flood plains of present-day streams
- Qao OLDER ALLUVIUM (QUATERNARY)--Subangular to subrounded cobbles, gravel, sand, and silt, forming a veneer, generally less than 6 ft (2 m) thick, on the surfaces of terraces up to 180 ft (55 m) above the beds of present-day streams
- Pmm McALESTER FORMATION, McCURTAIN SHALE MEMBER (PENNSYLVANIAN)--Predominantly dark-gray to black, blocky shales containing abundant ironstone concretions. Minimum thickness 400 ft (120 m)
- Pph HARTSHORNE FORMATION (PENNSYLVANIAN)--Grayish-orange (10YR7/4) to moderate-reddish-orange (10YR6/6) to very light gray (N8) very fine to fine-grained, ripple-marked, cross-bedded, thin-bedded to massive, bioturbated sandstone, containing abundant upright Calamites; interstratified with silty, medium-gray (N5) to grayish-black (N2) shale containing siditic nodules. Includes the Lower and Upper Hartshorne coal beds. Surface-mined areas in Lower Hartshorne coal in northwest part of Hontubby quadrangle designated PhmM. Thickness: 250 - 325 ft (76 - 100 m)
- Pa ATOKA FORMATION (PENNSYLVANIAN)--Predominantly poorly exposed, olive-gray (5Y3/2) to grayish-olive (10Y4/2), slightly silty, noncalcareous shale (Pa) containing siditic nodules. Includes numerous, continuous to discontinuous, ridge-forming moderate-yellowish-brown (10YR5/4) to dark-yellowish-orange (10YR6/6), very fine grained, silty, micaceous sandstones (Pass) containing plant fragments, sole markings, and trace fossils. Includes grayish-black (N2), fissile shale beds, and two unnamed coal beds in upper part. Sandstone units variable in thickness, generally thinly parallel-bedded with interstratified siltstones and shales; commonly ripple-marked; contacts usually gradational. Approximately 7,500 ft (2300 m) exposed north of Choctaw fault

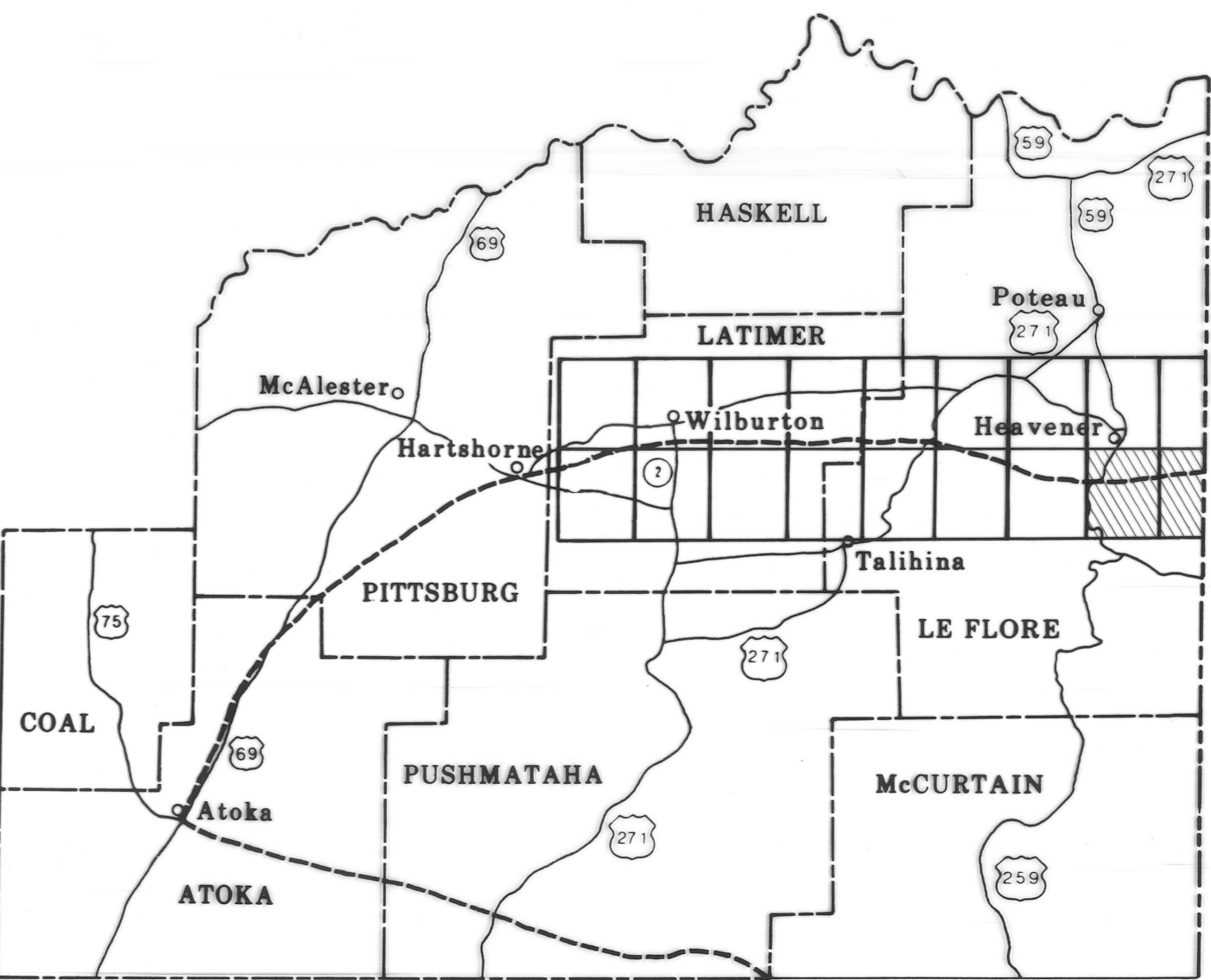
UNITS PRESENT NORTH OF CHOCTAW FAULT

- Ppa ATOKA FORMATION (PENNSYLVANIAN)--Predominantly alternating sandstone and shale (mudstone) sequence dominated by shale. Shale is olive-gray (5Y3/2) to grayish-olive (10Y4/2), slightly silty, noncalcareous, and poorly laminated. Single siliceous shale bed, 1.2 in. (3 cm) thick (marked on map). Sandstone is light-olive-gray (5Y5/2) and yellowish-gray (5Y7/2) where fresh, and grayish-orange (10YR7/4) where weathered. Mostly fine-grained, rarely medium grained, poorly to moderately sorted, noncalcareous, and composed predominantly of quartz, with minor feldspar, lithic fragments, and conspicuous white mica. Sandstone beds vary from several inches to several ft thick and average about 2 ft (60 cm). Amalgamated beds are common, forming resistant ridges and dip slopes, some of which are depicted (as marker beds) on the map. Sandstones, which are interpreted as turbidites, contain well developed sedimentary structures, including impressive sole structures (flute, groove and load casts, trace fossils), parallel and ripple cross lamination, and water expulsion (convolutions, dish and pillar) features. The formation is absent of macrofossils except for local concentrations of plant fragments on bedding planes. Thickness of the formation is uncertain, but a minimum 10,600 ft (3200 m) is estimated. Maximum exposed thickness south of Choctaw fault approximately 11,000 ft (3400m); top not exposed
- Ppiv JOHNS VALLEY FORMATION (PENNSYLVANIAN)--Predominantly poorly exposed, olive-gray (5Y3/2), noncalcareous, slightly silty shale and mudstone. Some shale beds in upper part of formation are dark-gray (N3) to grayish-black (N2), fissile and flaky. Other beds contorted, appear pervasively sheared. Contains thin beds of noncalcareous siltstone and a well-developed, 6 - 8 ft (2 - 3 m)-thick sandstone bed at top of formation. Sandstone is pale-yellowish-brown (10 YR6/2) to grayish-orange (10 YR7/4) to moderate-orange-pink (5YR8/4) to grayish-orange-pink (5YR7/2), very fine to fine- to medium-grained, noncalcareous, medium- to thick-bedded; in places includes a 1 ft (0.3 m)-thick calcareous, grayish-red (10R4/2), cross-bedded, coarse-grained conglomeratic sandstone bed at base. Flute casts and load casts common on soles.

Exposed only in southwest part of Hontubby quadrangle. Minimum thickness of formation is 650 ft (200 m)



INDEX TO QUADRANGLES, CROSS SECTIONS, AND AREA OF RESPONSIBILITY



LOCATION OF QUADRANGLE

GEOLOGIC MAP OF THE HONTUBBY AND LOVING QUADRANGLES, LE FLORE COUNTY, OKLAHOMA

By
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1993