# DIGITAL GEOLOGIC MAP OF THE CENTER POINT QUADRANGLE, HOWARD COUNTY, ARKANSAS

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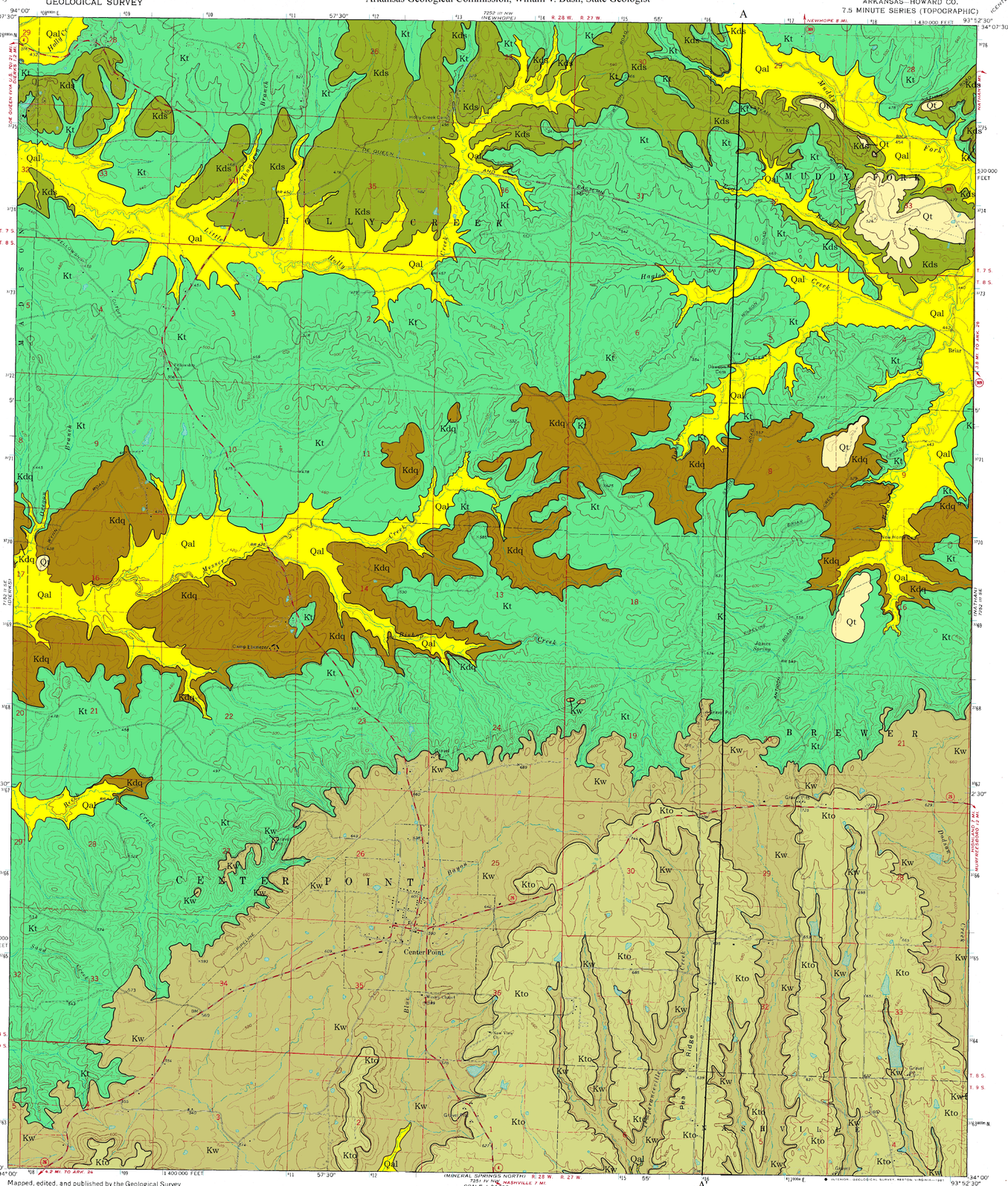
1997
Arkansas Geological Commission, Willam V. Bush, State Geologist

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CENTER POINT QUADRANGLE
ARKANSAS—HOWARD CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)




Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1968. Field checked 1970

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arkansas coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 15, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

To place on the predicted North American Datum 1983 move the projection lines 8 meters south and 18 meters east as shown by dashed corner ticks

UTM GRID AND 1970 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

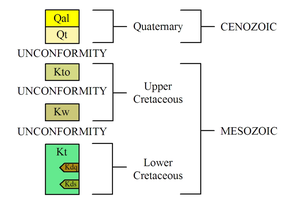
QUADRANGLE LOCATION

Funded by the Arkansas Geological Commission in cooperation with the United States Geological Survey, STATEMAP Project No. 1434-94-A-1223.

ROAD CLASSIFICATION
Secondary highway, all weather. Light-duty road, all weather, hard surface — improved surface
Unimproved road, fair or dry weather
State Route

CENTER POINT, ARK.
N3400—W9352.5/7.5
1970
AMS 7252 III SW—SERIES V884

## CORRELATION OF MAP UNITS




## DESCRIPTION OF MAP UNITS

**Qal** **Alluvium** *(Quaternary)* - Variably sized gravel overlain by unconsolidated sand, silt, and clay comprises the unit. This unit occurs in the floodplains of streams and rivers. The sediments form a rich loam and are excellent for agriculture. Gravels, primarily novaculite, originated in the Ouachita Mountain region and from local Cretaceous formations. Thickness varies from 0 to 25 feet. Areas of alluvium are presently receiving sediment deposition.

**Qt** **Terrace Deposit** *(Quaternary)*-Terrace deposits generally grade from basal gravel to silt and clay at the top. Gravels, primarily novaculite, originated in the Ouachita Mountain region and from local Cretaceous formations. Thicknesses are generally less than 50 feet. Terraces are topographic features which are former floodplains of nearby streams and/or rivers. The sediments form a rich loamy soil. The basal gravel is sometimes utilized for water-well production and gravel-mining operations.

**Kto** **Tokio Formation** *(Upper Cretaceous)*- The Tokio Formation consists of cross-bedded sand, gravel, gray clay, and volcanic ash. Basal cross-bedded gravels are approximately 30 feet thick. Minor sand and clay lenses occur within the gravel, while sand commonly fills the interstitial spaces around the gravel. Thinner beds (less than 1 foot in thickness) and lenses of gravel occur within the formation's sand intervals. The gravels range from pea-size to 6 inches in diameter and are composed of quartz, novaculite, sandstone, and quartzite. Iron-oxide-cemented conglomerates may be present locally. The cross-bedded sands are medium-to-fine-grained quartz with minor amounts of heavy minerals, glauconite, iron-oxide concretions, and rip-up clasts of gray clay. Sands weather yellow to orange-red in color. Gray clays are lignitic, pyritic, fossiliferous, and may contain leaf imprints. The volcanic ash is light gray to white and has altered to kaolinitic clay. The source area for much of the formation's sediment was the Ouachita Mountain region. The formation outcrop belt extends from near Arkadelphia, southwest to the Arkansas-Oklahoma state line, and dips to the south at approximately 80 feet per mile. The approximate thickness in the quadrangle is 80 feet. The unit was deposited in a nearshore marine environment on an unconformable surface which separates it from the underlying Woodbine Formation (Upper Cretaceous).

**Kw** **Woodbine Formation** *(Upper Cretaceous)* – The Woodbine Formation consists of water-laid, cross-bedded tuffs, tuffaceous sands, gravel, and red and gray clay. Basal cross-bedded gravels are approximately 20 feet thick and form a cuesta in the area. Thinner beds and lenses of gravel occur with the water-laid tuffs at the base of the unit. Gravels are ½ to 6 inches in diameter, well-rounded, and are composed of novaculite, quartz, sandstone, and quartzite. Iron-cemented conglomerates may be present locally. Igneous rock pebbles and cobbles are interbedded within the tuffs. Unweathered tuffs range from green to blue in color while weathered tuffs form a red waxy clay. The source for the volcanic sediments was probably centered in the area between Murfreesboro and Lockesburg, Arkansas. The source area for the formations' remaining sediments was primarily the Ouachita Mountain region. The outcrop belt extends from the Little Missouri River southwest to the Arkansas-Oklahoma state line, and dips to the south at approximately 80 feet per mile. The approximate thickness in the quadrangle is 150 feet. The unit was deposited in a near-shore marine environment and unconformably overlies the Trinity Group (Lower Cretaceous).

**Kt** **Trinity Group** *(Lower Cretaceous)* – The Trinity Group consists of gravel, sand, clay, gypsum, Celestine, and barite. The group is exposed in a east-west trending belt and dips to southward approximately 100 feet per mile. Sediments comprising this unit originated to the north in the Ouachita Mountain region and were deposited following a major unconformity an upturned and eroded Paleozoic surface in a near-shore marine environment. Members of the Trinity Group are the Paluxy Sand, DeQueen Limestone Member, Holly Creek Member, Dierks Limestone Lentil, and Delight Sand Member.

The **Paluxy Sand Member** is composed of cross-bedded medium- to fine-grained quartz sand, minor gravel, and bedded gray, light-gray, and brown clay. Sands weather from yellow to orange-red in color. The thickness of the unit on the quadrangle is approximately 250 fee. Near the base of the Paluxy Sand Member, sandstones with barite cement form topographic highs.

**Kdq** The **DeQueen Limestone Member** is composed of interbedded gray fossiliferous limestone, gray and green calcareous clay, very fine quartz sand, and silt. The thickness of the limestone beds vary, but rarely exceed 36 inches. Ripple marks, mud cracks, and worm trails are common on the upper surface of the limestone slabs. Clays weather yellow-brown and are sticky. The thickness of the member is approximately 100 feet in the mapped area. Fossils present are primarily brackish-water molluscan fauna, the most common being the *Ostrea franklini*. This member corresponds in part to the Ferry Lake anhydrite in the subsurface of southern Arkansas.

The **Holly Creek Member** is composed of cross-bedded gray, fine- to very fine-grained quartz sand, gravel and clay. Sands commonly weather yellow to red in color. Clays are typically gray to brown in color. The Ultima Thule gravel lens is a part of this member. The Ultima Thule consists of bedded pea-size gravel composed of novaculite, sandstone, and quartz. Minor sand and clay lenses occur within the gravel unit. The thickness of the Ultima Thule in the mapped area is 10 to 20 feet. The thickness for the entire member on the quadrangle is approximately 220 feet.

**Kds** The **Dierks Limestone Lentil** is composed of interbedded limestone and dark-gray to black clay. The thickness of this lentil is 60 fee. The abundance of *Ostrea franklini* indicates a brackish-water environment.

The **Delight Sand Member** is composed of crossbedded, fine sand interbedded with gray clays. Sands weather yellowish-orange, and are locally impregnated with asphalt.

## SYMBOLS

Contacts

Gravel Pit

## REFERENCES

Bush, W. V., and Clardy, B. F., 1971, Geologic Map of the Ashdown East Quadrangle, Little River and Hempstead Counties, Arkansas: Arkansas Geological Commission Open-File Report, scale 1:24,000.

Dane, C. H., 1929, Upper Cretaceous formation of southwestern Arkansas: Arkansas Goel. Survey Bull. 1, 215p.

Miser, H. D., and Purdue, A. H., 1929 Geology of the DeQueen and Caddo Gap Qudrangles, Arkansas: U.S. Geological Survey, Bulletin 808, scale 1:125,000.

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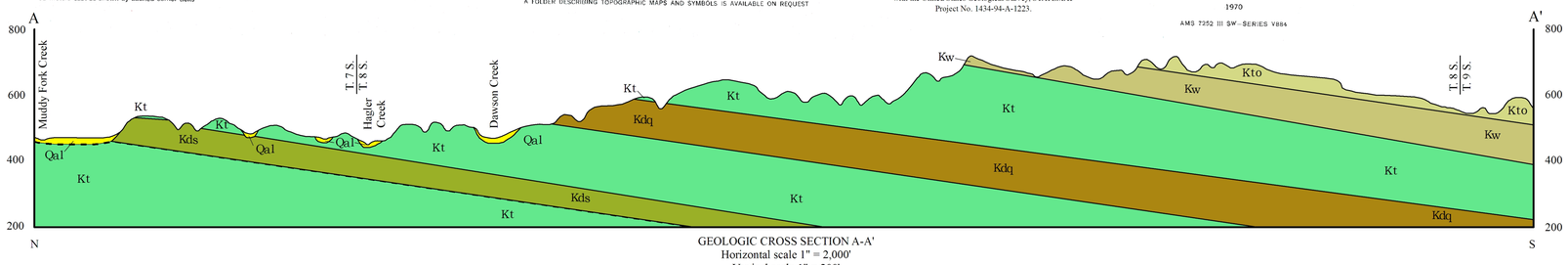


GEOLOGIC CROSS SECTION A-A'
Horizontal scale 1" = 2,000'
Vertical scale 1" = 200'

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Revised by: Jerry W. Clark and William D. Hanson