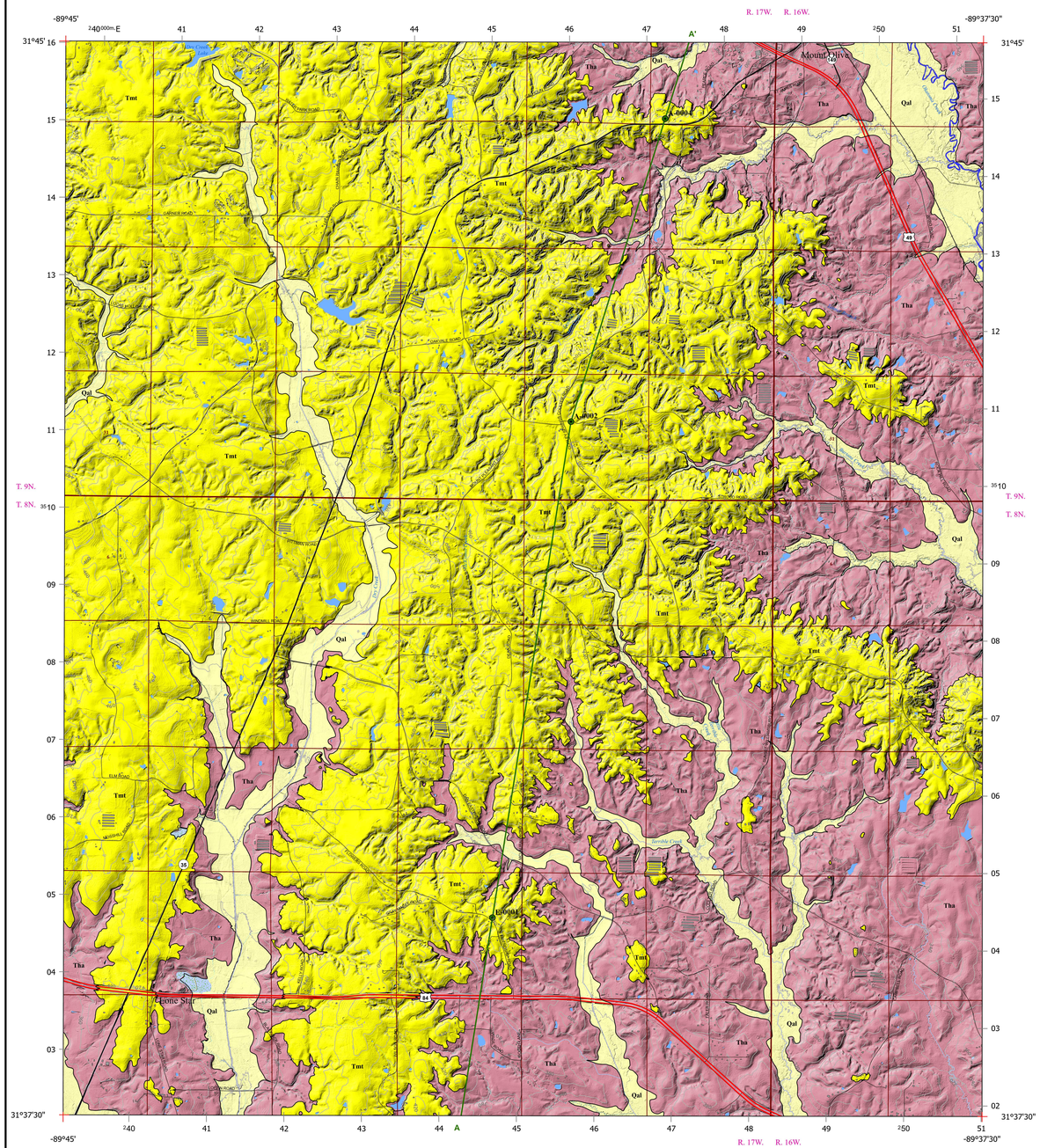
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF GEOLOGY SURFACE MAPPING DIVISION
MISSISSIPPI GEOLOGICAL SURVEY

Prepared in cooperation with
UNITED STATES GEOLOGICAL SURVEY
NATIONAL COOPERATIVE GEOLOGIC MAPPING PROGRAM

# GEOLOGIC MAP OF THE 7.5-MINUTE LONE STAR QUADRANGLE OPEN-FILE REPORT 357




Base map produced by the Mississippi Office of Geology
PCS: NAD 1983 UTM Zone 16N
GCS: GCS North American 1983
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: USGS MS Lone Star 2024 Topographic Map
MDEM base map data from MARIS
Borehole data from Mississippi Office of Geology.

Adjoining 7.5' Quadrangles



Scale 1:24000

1 ½ 0 1 Mile
1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet
1 0.5 0 1 Kilometers

Contour Interval 20 feet
North American Vertical Datum 1988 Geoid 12A

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program under STATEMAP award number #G25AS00030.

**Mississippi Office of Geology**
**Open-File Report 357**

## GEOLOGIC MAP of the LONE STAR 7.5-MINUTE QUADRANGLE

**Covington County, Mississippi**

**2026**

Geology by
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Mississippi Office of Geology - Surface Mapping Division
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Surface Mine

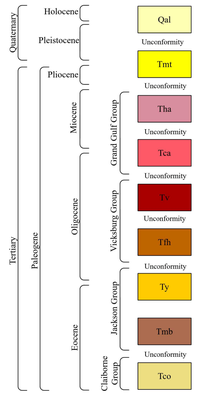
E-0001 Drill Hole Locality and Identification Number

Formational Contact

A — A' Line of Section




## Correlation of Map Units




## Descriptions of Map Units

**Alluvium (Pleistocene to Holocene)**
Qal
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, silty, clayey; humus lenses common. Streams on clay subcrop will exhibit shallow, wide alluvial plains while streams on sand subcrop tend to incise creating steep valleys with narrow alluvial plains, silicified wood common. Thickness approximately 15 feet along larger streams, thinning up tributaries.

**Magee Terrace (Pliocene to Pleistocene)**
Tmt
Generally fining-upward sequence of fluvial siliciclastic deposits attributed to courses of the Plio–Pleistocene ancestral Tennessee–Ohio River system. Sand is yellow, orange, purple, red, and pink; fine to coarse grained; predominantly quartzose; cross bedded to massive. Graveliferous, containing pea to cobble size clasts typically not exceeding 3 in. in length; clasts composed chiefly of chert with lesser amounts of quartz. Chert gravel is deeply weathered and typically incompetent above the water table and can be leached to tripolitic clay. Clay is kaolinitic, pink to white and occurs as discontinuous lenses and as basal rip up clasts. Floodplain silts and clays are preserved above approximately 550 ft MSL. The base of the unit is unconformable at roughly 400 ft MSL. Conglomeritic ironstone is commonly developed at the contact with the underlying Hattiesburg Formations.

**Grand Gulf Group**

**Hattiesburg Formation (Miocene)**
Tha
Deltaic sands, silts, and clays; Clay, green, gray, brown, weathers white to brown, silty to sandy, locally lignitic; Sand, gray, pale yellow to white, fine- to coarse-grained, cross-bedded to massive with thinly-bedded pea gravels; Pea gravel, black chert and milky quartz, highly polished, sub-angular to well rounded; often indurated to sandstones and siltstones at surface, predominantly quartzose with lesser amounts of chert, metaquartzite, mica, and heavy minerals, slightly glauconitic in places, silicified and coalified wood common. The base of the Hattiesburg Formation is designated at the base of a sand unit of regional extent that occurs above the last occurrence the benthic foraminifera *Heterostegina texana* at the approximate horizon of the base of the Fleming Formation in Louisiana and the Amos Sand in Alabama. Total thickness not represented in the mapping area.

*Cross Section Units Not Exposed at the Surface*

**Catahoula Formation (Oligocene to Miocene)**
Tca
Deltaic to marine gravels, sands, silts, clays, sandstone, ironstone, and limestone. Sand is gray, pale yellow to white; fine to coarse grained; cross bedded to massive. Contains rare thinly bedded pea gravel layers. Gravels consist of highly polished black chert and milky quartz, ranging from subangular to well rounded. Sand is commonly indurated near the surface to sandstone. Predominantly quartzose with lesser amounts of chert, metaquartzite, mica, and heavy minerals; slightly glauconitic in places. Silicified wood and fossil palm fragments are common. Clay is green, gray, and brown; weathers white to brown in color; silty to sandy. Lignite is common in basal clay intervals. Unit is fossiliferous in part. Limestone (Tatum Limestone Member) is characterized by the benthic foraminifera *Heterostegina texana*. Occurs in the subsurface within the Catahoula Formation. The Catahoula Formation unconformably overlies and locally incises into the underlying Bucatunna Formation. Estimated thickness is approximately 540 ft.

**Vicksburg Group**

**Vicksburg Limestone Undifferentiated (Oligocene)**
Tv
Includes the undifferentiated associated marine units, listed in descending stratigraphic order: Bucatunna Formation, Byram Formation, Glendon Formation, Marianna Formation; and Mint Springs Formation. The Bucatunna Formation consists of carbonaceous clays dark brown to gray in color, silty to fine sandy, averaging about 45 ft in thickness but reaching up to 60 ft within the mapping area. The Byram Formation is composed of sandy to clayey marl, glauconitic and fossiliferous, with a thickness of up to approximately 12 ft. The Glendon Formation consists of semi crystalline limestone interbedded with softer clayey marls and represents the marine highstand of the early Oligocene Vicksburg sequence. The underlying Marianna consists of soft clay marls. Collectively the Glendon-Marianna section reaches a maximum thickness of about 30 ft in the mapping area; The Mint Springs Formation consists of gray to green colored glauconitic and fossiliferous quartz sand. The Vicksburg Group is biostratigraphically characterized by the presence of *Pecten byramensis* and the larger benthic foraminifera *Lepidocyclina* sp. The Vicksburg Group unconformably overlies the Forest Hill Formation.

**Forest Hill Formation (Oligocene)**
Tfh
Deltaic sands, silts, and clays. Sand is fine-grained, silty, and quartzose; clay is carbonaceous and laminated, with lignite and silicified wood common. Carbonized plant fossils occur along fissile partings in clay intervals. The Forest Hill Formation unconformably overlies and commonly incises into the Yazoo Formation and represents the lowermost unit of the Vicksburg Group, distinguished from overlying units by its terrestrial to deltaic depositional setting. Approximate thickness is 80 ft in the mapping area.

**Jackson Group**

**Yazoo Formation (Eocene to Oligocene)**
Ty
Outer neritic to bathyal marine clay. Clay is calcareous and montmorillonitic, blue green when in color unweathered, sparingly fossiliferous marine mollusk shell hash common along partings and bentonite seams present. Limestone ledges occur in places. The Yazoo Clay reaches a thickness of approximately 515 ft. The Yazoo Formation is marked by the planktonic foraminifera *Hantkenina alabamensis*. The Yazoo Formation conformably overlies the Moodys Branch Formation.

**Moodys Branch Formation (Eocene)**
Tmb
The Moodys Branch Formation represents the basal member of a marine transgression towards the close of the Eocene epoch, situated unconformably above the deltaic to estuarine Cockfield Formation and conformably below the outer neritic to bathyal clays of the Yazoo Formation. It consists of sandy, fossiliferous marl containing abundant marine mollusk shells of the genera *Glycymeris* and *Venericardia*. The unit unconformably overlies the Cockfield Formation, reflecting the delta destructional phase and subsequent marine transgression, and it conformably grades upward into the Yazoo Formation. Total thickness is approximately 15 ft.

**Claiborne Group**

**Cockfield Formation (Eocene)**
Tco
Deltaic deposits dominated by clays in the upper portions of the formation and sands in the lower portion. Clays are gray to brown in color, silty to fine sandy, plastic, strongly carbonaceous with thin beds of lignite common, slightly micaceous, and locally pyritic. Sands are quartzose and are cross bedded to massive, locally lignitic, and can be silty to clayey.

## Field Photographs

Looking north across Dry Creek Lake from the vantage point of the dam in Section 17, Township 9 North, Range 17 West.

Alluvial sands in the stream bed of Lenard's Mill Creek in Section 24, Township 9 North, Range 17 West.

Sandy alluvium exposed along the channel of an intermittent portion of Dry Creek in Section 9, Township 8 North, Range 17 West.

Natural levee sands freshly deposited on the floodplain of Lenard's Mill Creek in Section 24, Township 9 North, Range 17 West.

Limonite stained graveliferous sands of the Magee Terrace exposed along the valley of Dry Creek in a road cut in Section 28, Township 9 North, Range 17 West.

Conglomeritic ironstone of the Magee Terrace exposed in a gravel pit near the dam of Dry Creek Lake in Section 17, Township 9 North, Range 17 West.

Limonite stained graveliferous sands of the Magee Terrace exposed along the highwall of a gravel pit near the dam of Dry Creek Lake in Section 17, Township 9 North, Range 17 West.

Manganese oxide stained kaolinitic clay lens of the Magee Terrace exposed along the bank of Dry Creek Lake in Section 17, Township 9 North, Range 17 West.

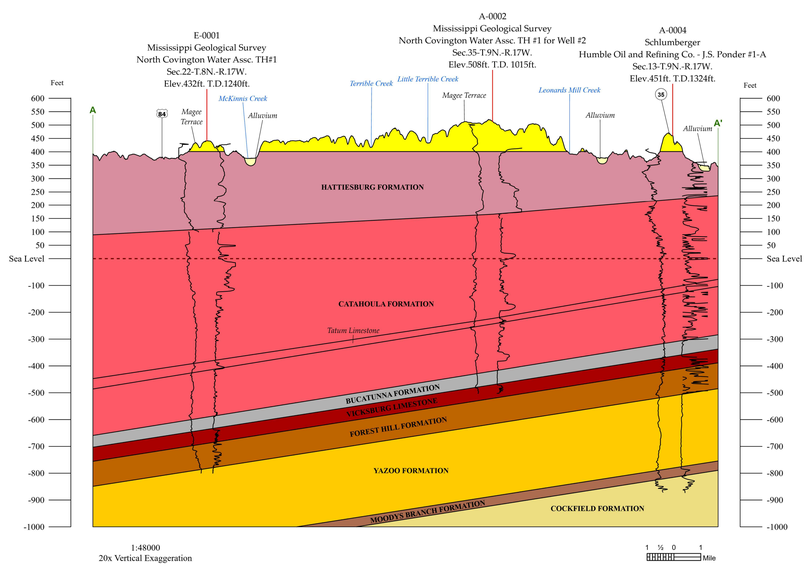
Fluvial cross bedding in limonite stained sands and gravels of the Magee Terrace exposed along a road cut in Section 7, Township 8 North, Range 16 West.

The Magee Terrace exposed in a road cut in Section 7, Township 8 North, Range 16 West.

Clay outcrop of the Hattiesburg Formation exposed along the channel of Lenard's Mill Creek in Section 24, Township 8 North, Range 16 West.

Weathered clay outcrop of the Hattiesburg Formation exposed along the channel of Terrible Creek in Section 24, Township 8 North, Range 17 West.

## Structural Cross-Section of the Lone Star 7.5-Minute Geologic Quadrangle




1:48000
20x Vertical Exaggeration

1 ½ 0 1 Mile