

Base Map produced by the Mississippi Geological Survey
Source: Statewide 1:24,000 Topo Map
Projection: Mercator Auxiliary Sphere; Datum: WGS 1984; UTM Meter
Declination: World Magnetic Model, January 2, 2022, estimated Magnetic North declination in quadrangle center is approximately 0° west per year, or 1°10' west of True North at 0°21'. Annual rate of declination change is approximately 0°6' west per year.
Lidar: Mississippi Department of Environmental Quality (MDEQ), U.S. Army Corps of Engineers (USACE), United States Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), Federal Emergency Management Agency (FEMA), National Oceanic and Atmospheric Administration (NOAA), National Park Service (NPS), and Tennessee Valley Authority (TVA). Project span 2005-2017.
Hydrography: USGS, MDEQ, and NOAA. Project span 2005-2017.
Contours: Lidar derived
Roads: Mississippi Department of Transportation (MDOT) 2018
Building Footprints: Microsoft 2019
Surface Mines: MDEQ Office of Geology - Mining and Reclamation Division
Boreholes: MDEQ Office of Geology - Environmental Geology Division

GEOLOGIC MAP of the RIDGELAND QUADRANGLE Madison and Hinds Counties, Mississippi

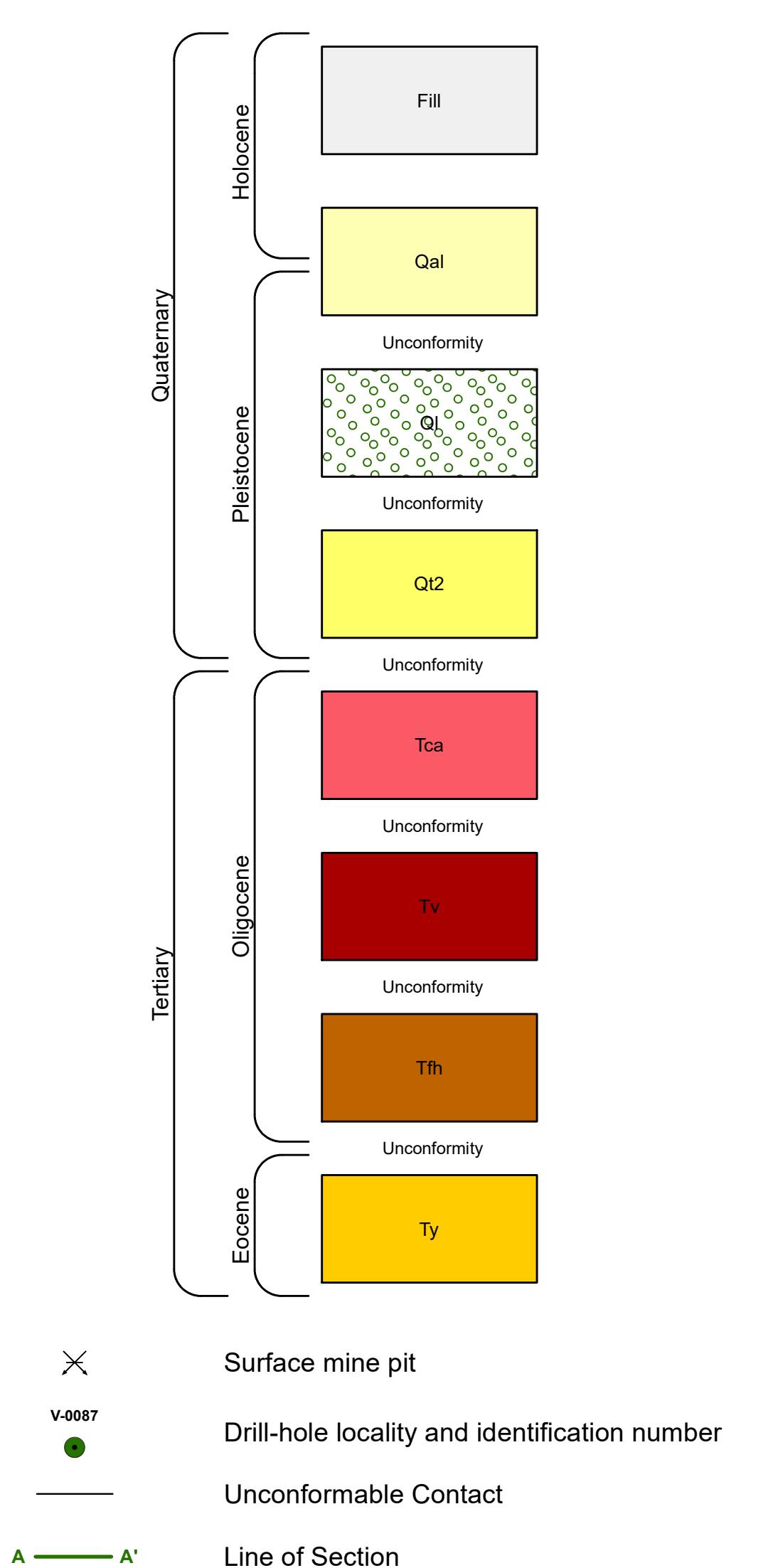


2021
Geology by
Jonathan R. Leard, RPG, James E. Starnes, RPG, and David E. Thompson, RPG
Dedicated to
William H. Moore, State Geologist

This geologic map was funded by the United States National Park Service, Geologic Resources Division. Geology field checked in 2020 and 2021 using DMR, Projection: Mercator Auxiliary Sphere; Datum: WGS 1984, Horizontal Units: Kilometers, Vertical Units: Feet
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MDEQ-GEOLOGY Geographic Information Systems: Daniel W. Morse
MDEQ-GEOLOGY Drillers: Archie McKenzie and Trey Magee
MDEQ-GEOLOGY Geophysical Logging: Andrew Newcomb and Paul Parrish
Geologic maps are only a guide to current understanding and do not eliminate the need for detailed investigations of specific sites for specific purposes. The views and conclusions contained in this report are those of the geologists and should not be interpreted as representing the official policies, either expressed or implied, of the State of Mississippi or of the United States Government.



Correlation of Map Units



Descriptions of Map Units

Fill
Recent fill related to anthropomorphic extensive land development activity. Exclusively mapped are the operations encompassed by the Little Dixie Environmental Landfill in Section 31 Township 7N, Range 1E.

Alluvium
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, silty, clayey; humus lenses common; deposits are heavily loess-derived. Silicified wood common. Streams on clays will have shallow, wide alluvial plains while streams on sands will incise creating steep, narrow alluvial plains. Can contain Pleistocene vertebrate fossils.

Loess
Silt, buff to tan, pale yellow, gray-green in anoxic conditions, weathers brown to red; quartzose to feldspathic. Loess is an eolian deposit derived from glacial outwash. Loess is typically calcareous with dolomite and calcite; the upper portion of the loess is deeply weathered, leached/noncalcareous, clayey, and is commonly referred to as "brown loam." Loess deposits unconformably blanket topography with substantial local variation in thickness. The loess weathering profile when in contact with the underlying calcium-rich montmorillonitic Yazoo Clay can produce quality, naturally-tempered kaolinized clay mixture ideal for use in brick manufacturing. In places, weathered loess contains secondary deposits of calcareous and dolomitic material, including dolomite, calcite, and calcite-filled root casts. Loess can be locally to sparingly fossiliferous, typically containing tests and steinkerns of pulmonate gastropods and less commonly containing fossils of Pleistocene vertebrates.

High Terrace (Q2)
Terrace Deposit underlying Loess but not apparently attributable to the ancestral Mississippi River. Sand, orange to tan colored, fine- to coarse-grained, predominately quartzose. Clay, loess or rip-up derived, kaolinized, pink to white, generally discontinuous lenses. Gravelous, pebble-size, almost exclusively quartzite.

Significant effort was spent delineating terrace deposits using past investigations by the Mississippi Geological Survey and field investigations for this project. Terraces attributed as Q2 contain gravels less than an inch in diameter. Many terraces mapped in the past have since been utilized or have eroded. If the terrace was not verified during field work, it was not recycled from previous literature. A Second level terrace is discontinuously mapped in Sections 31 and 32 Township 8N, Range 1E, Section 36 Township 8N, Range 1W, Section 1 Township 7N, Range 1W, and Sections 5, 6, and 7 Township 7N, Range 1E. The base unconformably overlies the Yazoo Fm. from 270 to 300 ft ms!.

Catahoula Formation
Deltaic: Sand, red to khaki, fine-to coarse grained, predominately quartzose with polished black chert grains; Gravel, pea sized, predominately quartz with small amounts of chert. Clay, Purple, pink, white, Kaolinitic. Ironstone common where sands overlie clays. Sands indurate where exposed elsewhere; However, induration was not encountered on this map except as ironstone. Represented as a channel incised through the Vicksburg Group and slightly the Forest Hill Formation in Sections 10, 11, 14, and 15 Township 7N, Range 2E.

Vicksburg Group
Includes the undifferentiated Glendon Formation and underlying Mint Springs Formation. Vicksburg Group is notably absent in Sections 10, 11, 14, and 15 Township 7N, Range 2E, and replaced with a massive sand deposit with basal pea gravel and ironstone at the contact with Forest Hill Clays attributed to the Catahoula Formation due to its stratigraphic position. Glendon Formation- Semi-Crystalline Limestone interbedded with softer clayey marls reaching a maximum thickness of about 30 feet. Represents the highstand of the Oligocene Vicksburg Seas. Glendon Limestone is outcrop where Vicksburg Group is mapped. Mint Springs Formation - Sandy marl to a limy sand, very fossiliferous in the subsurface, tan to so white, thin bedded, and occurs in a thick lens in Section 9 Township 7N, Range 1E, underneath a thick cover of Glendon Limestone ledges. Thickness is less than 5 feet. Upper most Glendon ledges are typically karstic with voids are filled with soil. Fossiliferous: Bryozoa, foraminifera, bivalves, *Ostrea vicksburgensis*, and *Pecten pouloensis*.

Forest Hill Formation
Sand, fine-grained, silty, quartzose. Clay, carbonaceous, laminated, lignite and silicified wood common. Lignite plant fossils common along fissile partings in clays. The unconformable contact between the Forest Hill Formation and the underlying Yazoo Clay is a classic contact with a distinct 2-foot-thick lignite seam. Forest Hill Formation Section 28 Township 6N, Range 1E, at Society Ridge Church and demonstrated as 1-foot carbonaceous clay layer above the contact Section 20 Township 7N, Range 1E, at Rocky Hill Church. In Sections 10, 11, 14, and 15 Township 7N, Range 2E, the Forest Hill Fm. has incised into the Yazoo Clay. The Forest Hill Formation is the lowermost unit of the Vicksburg Group and is differentiated because it is a terrestrial deltaic deposit.

Yazoo Formation (Yazoo Clay)
Olive-brownish, monotonous, and blue-green color unweathered, marine shell hash common along partings, locally containing bentonite seams; weathers tan to yellowish-brown with calcite common. Locally fossiliferous: containing beds of the oyster *Zyprona trigonalis* and *Basilosaurus cetoides*. Selenite locally along joints where clay is frambooidly pyritiferous. Limestone ledges. The Yazoo Clay reaches a thickness of approximately 430 feet. Weathering at outcrop, the Yazoo Clay can pose a high-risk for slope stability, engineering, and construction projects due to its high shrink-swell potential.

Glendon Formation (Glendon Clay)

Grey, monotonous, and blue-green color unweathered,

marine shell hash common along partings, locally containing bentonite

seams; weathers tan to yellowish-brown with calcite common.

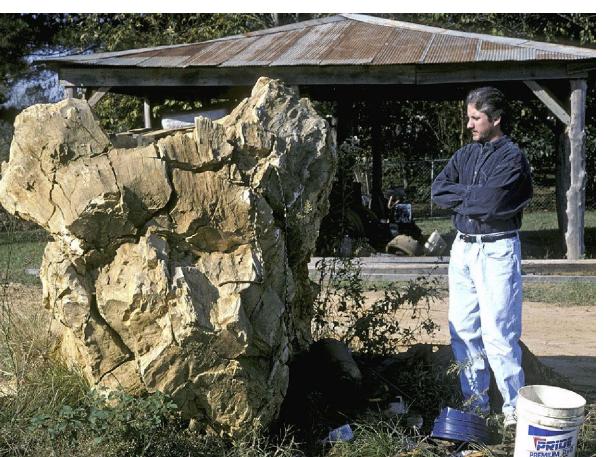
Locally fossiliferous: containing beds of the oyster *Zyprona trigonalis* and *Basilosaurus cetoides*. Selenite locally along joints where clay is frambooidly pyritiferous. Limestone ledges. The Yazoo Clay reaches a thickness of approximately 430 feet. Weathering at outcrop, the Yazoo Clay can pose a high-risk for slope stability, engineering, and construction projects due to its high shrink-swell potential.

Weathered ledges of Glendon Limestone from the Vicksburg Group exposed during home construction in Section 9 Township 7N, Range 1E. Photographed August 5, 2020.

Unweathered ledges of Glendon Limestone from the Vicksburg Group exposed during home construction in Section 9 Township 7N, Range 1E. Photographed August 5, 2020.



James Starnes standing in front of a vertical Loess bank in Section 27 Township 7N, Range 1E. Photographed August 6, 2020.



David Thompson beside a petrified stump excavated from a terrace sand and gravel pit in Mt. Centre Church sand pit in the NE4, SE4, Section 36, T. 8 N., R. 1 W. Photographed on 11/13/1996.



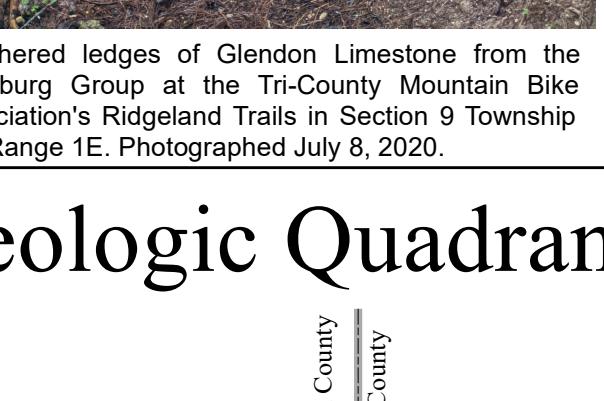
Petrified wood in terrace sand matrix around petrified wood at 300 ft ms at Mt. Centre Church sand pit in the NE4, SE4, Section 36, T. 8 N., R. 1 W. Photographed on 11/13/1996.



Jonathan Leard pointing to typical Forest Hill Sands on the side of N. Livingston Road in Section 10 Township 7N, Range 1E. Photographed August 5, 2020.



A large petrified log from basal Forest Hill Clays extracted during private road construction in Section 29 Township 7N, Range 1E. Photographed July 8, 2020.



Weathered ledges of Glendon Limestone from the Vicksburg Group exposed during home construction in Section 9 Township 7N, Range 1E. Photographed August 5, 2020.

Unweathered ledges of Glendon Limestone from the Vicksburg Group exposed during home construction in Section 9 Township 7N, Range 1E. Photographed August 5, 2020.

Structural Cross-Section of the Ridgeland 7.5-Minute Geologic Quadrangle

