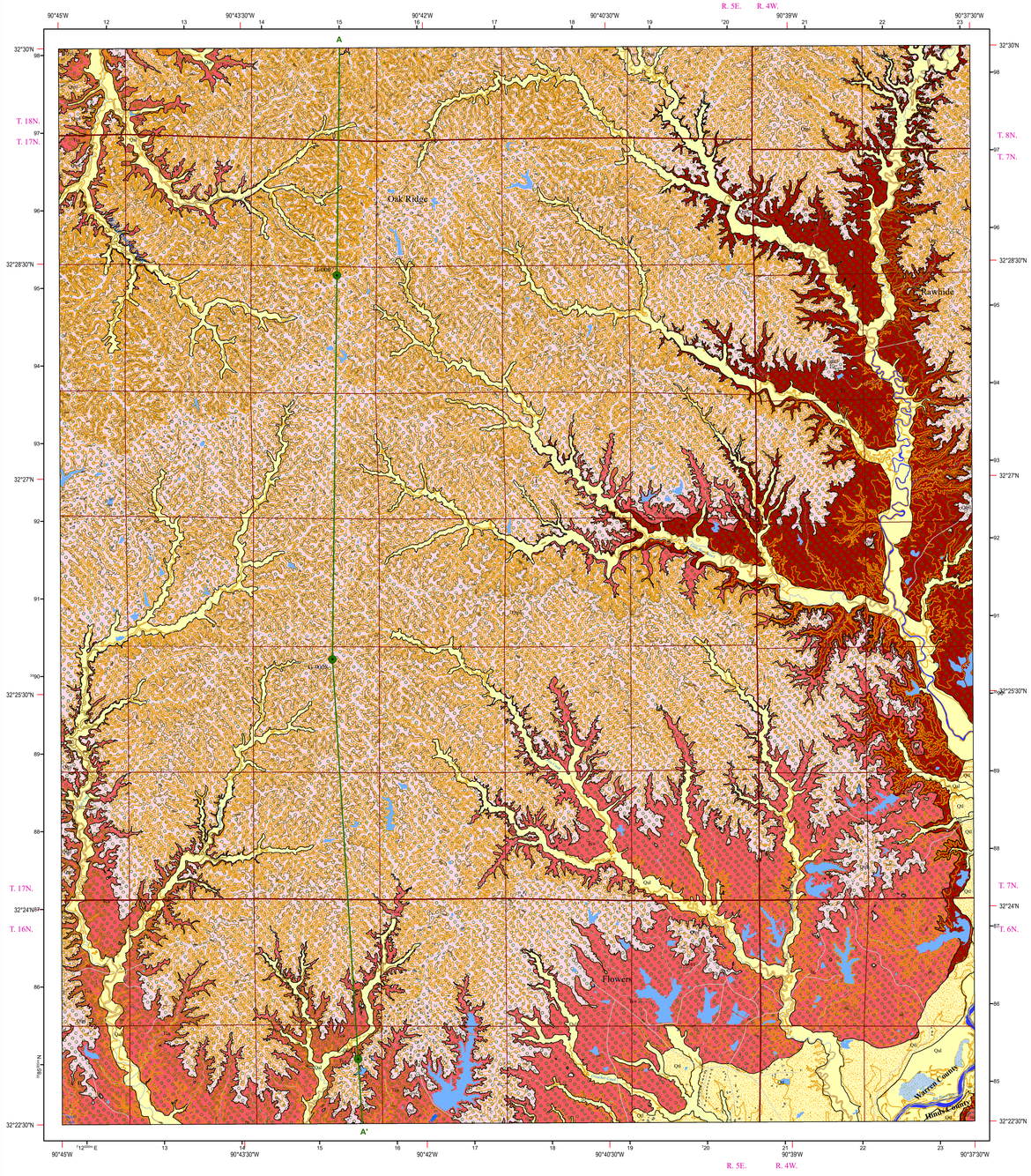
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF GEOLOGY SURFACE MAPPING DIVISION
MISSISSIPPI GEOLOGICAL SURVEY

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

GEOLOGIC MAP OF THE 7.5-MINUTE OAK RIDGE QUADRANGLE OPEN-FILE REPORT 342



Base Map produced by the Mississippi Geological Survey
Coordinate System:NAD 1983 UTM Zone 15N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: World Magnetic Model, December 31, 2019, estimated Magnetic North declination in 7.5-Minute Oak Ridge Quadrangle, (90°41'24.00"W, 32°26'09.60"N), center area is 1.20° west of True North ± 0.36°. Annual rate of declination change is approximately 0.09° west per year.
Basemap Data sourced from https://maris.mississippi.edu/.
Contours are derived from LIDAR data.
Borehole data from Mississippi Office of Geology.

Scale 1:24000

1 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

Surface Mine
G-0008 Drill-hole locality and identification number
Unconformable Contact
A — A' Line of Section

LIDAR derived Bare Earth Hillshade

1 ½ 0 1 Miles

Adjoining 7.5' Quadrangles

FLOWEREE	ELDORADO	PHOENIX
REDWOOD	OAK RIDGE	QUEENS HILL LAKE
VICKSBURG EAST	BOVINA	EDWARDS

Mississippi Office of Geology
Open-File Report 342

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GEOLOGIC MAP of the OAK RIDGE 7.5-MINUTE QUADRANGLE
Warren and Hinds Counties, Mississippi
2024

Geology by

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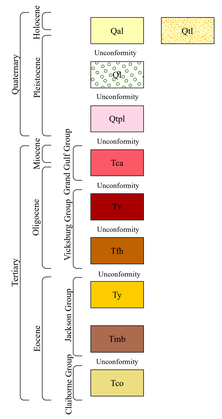
Geologic maps are only a guide to current understanding and do not eliminate the need for detailed investigations of specific sites for specific purposes. The views and conclusions contained in this Open-File Report are those of the geologists and should not be interpreted as representing the official policies, either expressed or implied, of the State of Mississippi or of the United States Government.

Correlation of Map Units



Descriptions of Map Units

Qal

Alluvium (Holocene to Pleistocene)
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, locally graveliferous containing aggregate derived from the Pre-loess Terrace deposits, silty to clayey; humus lenses common; floodplain deposits are heavily loess-derived. Silicified wood common. Tributaries have narrow alluvial valleys and are deeply incised through the loess terrain.

Qtl

Stream Terrace (Holocene to Pleistocene)
Stream terrace deposits dominantly associated with the Big Black River; Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, locally graveliferous containing aggregate derived from the Pre-loess Terrace deposits, silty to clayey; humus lenses common; floodplain deposits are heavily loess-derived. Silicified wood common. These terraces are known to contain important pre-historic archeological deposits.

Ql

Loess (Pleistocene)
Silt, buff to tan, pale yellow, red, grey to grey-green where in anoxic conditions, quartzose to feldspathic. Loess is considered an eolian deposit derived from glacial outwash. Loess is typically calcareous with dolomite and calcite; however, the upper portion of the loess can be deeply weathered, leached / noncalcareous, and has been commonly referred to as "brown loam." Loess deposits unconformably blanket the pre-loess topography with substantial local variations in thickness but generally thickening towards the west. In places, weathered loess contains secondary deposits of small calcareous concretions (caliche, loess dolls). Loess can be locally and sparingly fossiliferous, commonly containing tests or steinkerns of pulmonate gastropods and less commonly containing fossils of Pleistocene vertebrates.

Qtpl

Pre-loess Terrace Deposits (Pleistocene)
Pleistocene ancestral Mississippi River terraces deposited prior to Pleistocene loessification. Sand, yellow, orange, purple, red, pink, fine- to coarse-grained, predominantly quartzose, cross-bedded to massive; graveliferous, pea to large cobble size clasts, boulder size ice-rafted clasts of sandstone and chert. Economically significant gravels are predominantly chert with lesser amounts of vein quartz, metaquartzite, agate, sandstone, and rare rhyolite clasts; clay, pink to white, generally occurring as discontinuous lenses and as rip-up clasts up to boulder-size. Conglomeratic ironstone ledges are common in the graveliferous sands at the base of the deposits precipitate from unconfined groundwater. The base of this terrace occurs at approximately 220 ft MSL.

Grand Gulf Group

Tca

Catahoula Formation (Oligocene)
Deltaic sands, silts, and clays; Sand, grey, pale yellow to white, fine- to coarse-grained, cross-bedded to massive, predominantly quartzose with lesser amounts of chert, metaquartzite, mica, and heavy minerals, slightly glauconitic in places with rare thinly-bedded pea gravels, Gravels, black chert and milky quartz, highly polished, immature, subangular to well rounded; Clay, green, grey, brown, kaolinitic, weathers white to brown exhibiting a "popcorn" appearance, silty to sandy, lignite common in basal clays. Typically indurates to opaline-cemented sandstones and rarer orthoquartzites where exposed, silicified wood and fossil *Palmoxylon* common. Ironstone common where sands overlie clays. The Catahoula Formation unconformably overlies the Bucatunna Formation. Total thickness is not represented on this map.

Vicksburg Group

Tv

Vicksburg Limestone Undifferentiated (Oligocene)
Includes in descending order: the Bucatunna Formation, Byram Formation, Glendon Limestone, Marianna Limestone, and Mint Spring Formation. The Bucatunna is predominantly dark brown carbonaceous clay with thinly interbedded fine sands. It contains sparse estuarine mollusks towards its base and carbonized palaeobotanical fossil remains are common throughout. The Bucatunna differentiated in cross-section only to demonstrate the uncomfortable relationship with the overlying Catahoula Formation. The Glendon Limestone is white to grey, commonly indurated to semi-crystalline bioclastic limestone, either massive or with alternating ledges separated by thinly-bedded glauconitic marl. The Glendon Limestone commonly contains solution cavities at or near outcrop. Larger cavities usually form at the contact with the underlying Marianna Limestone. The Marianna Limestone is white to pale-yellow, soft to indurated, glauconitic marl, containing an admixture of fine-grained sands and clays in places. There is an abundance of the large Foraminifera *Lepidocyclina mantelli* in the Marianna Limestone and *Lepidocyclina supera* in the Glendon Limestone and the echinoid *Clypeaster rogersi*. Mint Springs Formation is a fossiliferous, fine-grained quartz marly sand containing the cassidulid echinoid *Rhyncholampus gouldii*. The Vicksburg Limestone unconformably overlies the Forest Hill Formation. Thickness is approximately 135 feet.

Cross Section Units Not Exposed at the Surface

Tfh

Forest Hill Formation (Oligocene)
Deltaic sands, silts, and clays. Sand, fine-grained, silty, quartzose; Clay, carbonaceous, laminated, lignite and silicified wood common, including *Palmoxylon*. Lignitic with paleobotanical fossil remains common along fissile partings in clays. The Forest Hill Formation unconformably overlies the Yazoo Formation. Total thickness is approximately 110 feet.

Jackson Group

Ty

Yazoo Formation (Eocene)
Locally referred to as the Yazoo Clay. Clay, bluish-green to bluish grey, weathers yellowish brown to tan, montmorillonitic, calcareous, silty, locally fossiliferous, locally contains framboidal pyrite. The fossil oyster *Pycnodonte trigonalis* are common throughout along with fossil vertebrate remains of Archaeocete whales, sharks and fish. The Yazoo Formation conformably overlies the Moodys Branch Formation. Total thickness is approximately 550 feet.

Tmb

Moodys Branch Formation (Eocene)
Sandy fossiliferous marl containing an abundance of marine invertebrates, particularly shells of *Glycymeris idonea* and *Venericardia apodensata*. Conformably grades into the overlying Yazoo Formation. Total thickness is approximately 15 feet.

Claiborne Group

Tco

Cockfield Formation (Eocene)
Clay, brown, reddish-brown to grey in color; silty to fine sandy; strongly carbonaceous to lignitic, slightly micaceous, pyritic. Carbonized and silicified palaeobotanical fossil remains common. Dominated by deltaic sands towards the base. Underlies the Moodys Branch Formation unconformably.

Field Photographs

Pleistocene to Holocene loess silt-derived alluvium containing lenses of sand and gravel derived from Pre-loess Terrace Deposits exposed along the active channel of Clear Creek photographed on February 5, 2024 in Section 6, Township 16 North, Range 5 East.

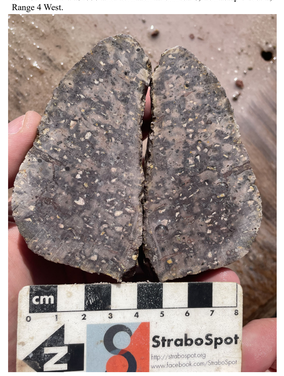
An outcrop of eolian Pleistocene loess unconformably overlying fluvial sand and gravels of an eroded Pleistocene Pre-loess Terrace Deposit photographed on March 16, 2023, in the Hammett Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.

Glacially faceted and polished chert gravel clasts exhibiting striae collected from Pleistocene gravels of a Pre-loess Terrace Deposit from the Hammett Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.

Glacially faceted and polished silicified wood clast exhibiting striae collected from Pleistocene gravels of a Pre-loess Terrace Deposit photographed on April 6, 2021, from the Hammett Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.

Gravel clast of Proterozoic banded Sioux Quartzite collected from Pleistocene gravels of a Pre-loess Terrace Deposit photographed on December 16, 2019, from the Hammett Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.

A halved gravel clast of rhyolitic welded tuff derived from the St. Francois Mountains collected from the Hammett Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.



A halved gravel clast of trachyte derived from the St. Francois Mountains collected from a Pre-loess Terrace Deposit at the Hammett Gravel Company, Inc. Gravel Pit P13-006 near Rawhide in Section 8, Township 7 North, Range 4 West.

A glacially ice-rafted, angular, Paleozoic chert boulder clast collected from a Pre-loess Terrace Deposit photographed on December 16, 2019, in Hammett Gravel Company, Inc. Rawhide Gravel Pit P13-006 in Section 8, Township 7 North, Range 4 West.

"Cauliflower chert" quartz-lined geode derived from the Mississippian period limestones of the Warsaw and Ft. Payne formations collected from Pre-loess Terrace derived stream alluvium of Clear Creek photographed on May 21, 2024, in Section 32, Township 9 North, Range 4 West.

Oxidation along jointing of clay in the Upper Oligocene Catahoula Formation exposed along the active channel of Clear Creek photographed on February 5, 2024, in Section 29, Township 18 North, Range 5 East.

An outcrop of Upper Oligocene Glendon Limestone exposed along the active channel of Little Bear Creek photographed on August 8, 2014, in Section 20, Township 7 North, Range 4 West.

Invertebrate fossils of *Pecten hyramensis* and *Clypeaster rogersi* preserved in Upper Oligocene Glendon Limestone exposed along the active channel of Little Bear Creek photographed on August 8, 2014, in Section 20, Township 7 North, Range 4 West.

Structural Cross-Section of the Oak Ridge 7.5-Minute Geologic Quadrangle