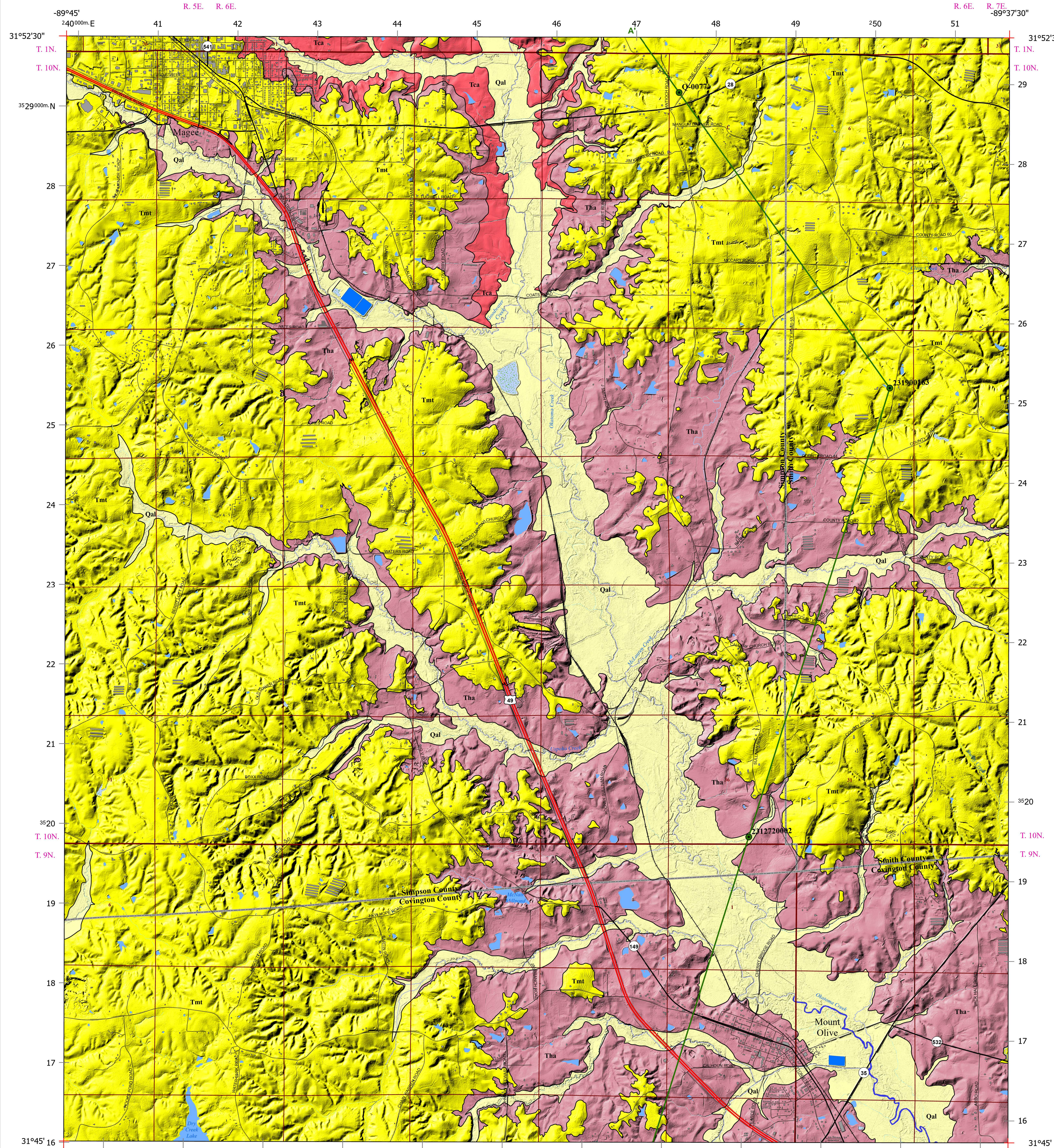
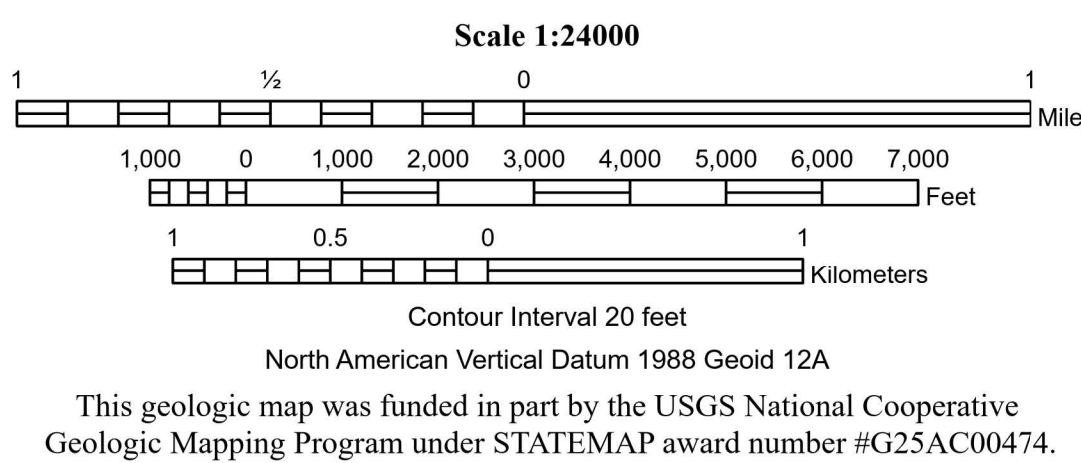




Base map produced by the Mississippi Office of Geology
PCS: NAD 1983 UTM Zone 16N
GCS: GCS North American 1983
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: USGS MS Magee South 2024 Topographic Map
MDEM base map data from MARIS
Borehole data from Mississippi Office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



Mississippi Office of Geology
Open-File Report 358

GEOLOGIC MAP of the MAGEE SOUTH 7.5-MINUTE QUADRANGLE

Simpson, Covington, and Smith Counties, Mississippi

2026

Geology by
Jonathan R. Leard, PhD, RFG, James E. Starnes, RFG,
Timothy J. Palmer, RFG, and Nataliya S. Usachenko, GTT



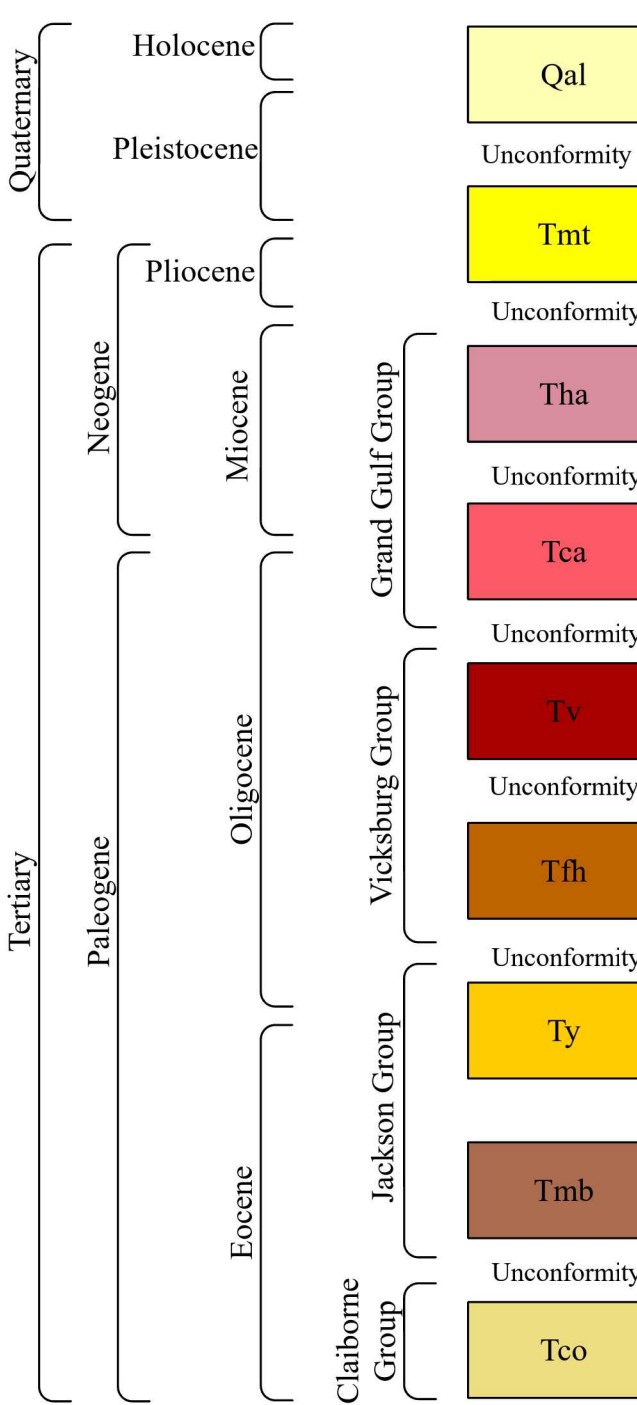
Mississippi Department of Environmental Quality
Mississippi Office of Geology - Surface Mapping Division
Mississippi Geological Survey
700 North State Street
Jackson, Mississippi 39225

Copyright © 2026 Mississippi Department of Environmental Quality, Office of Geology



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

Alluvium (Pleistocene to Holocene)

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)

Generally fining-upward sequence of fluvial siliclastic 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; predominately 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 Catahoula and Hattiesburg Formations.

Grand Gulf Group

Hattiesburg Formation (Miocene)

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 of 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.

Catahoula Formation (Oligocene to Miocene)

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.

Cross Section Units Not Exposed in the Surface

Vicksburg Group

Vicksburg Limestone Undifferentiated (Oligocene)

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 *Lepidocyclus* sp. The Vicksburg Group unconformably overlies the Forest Hill Formation.

Forest Hill Formation (Oligocene)

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)

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 *Haukequina alabamensis*. The Yazoo Formation conformably overlies the Moodys Branch Formation.

Moodys Branch Formation (Eocene)

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)

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 lignitic 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 west across Dry Creek Lake from Dry Creek Campground in Section 17, Township 9 North, Range 17 West.



Quartz sand in the active channel of the alluvium of Goodwater Creek in Section 6, Township 10 North, Range 6 East.



Carbonaceous, clayey quartz sand alluvium exposed along the channel of Goodwater Creek in Section 6, Township 10 North, Range 6 East.



Entrance sign for McNair Springs public park in Section 8, Township 10 North, Range 6 East.



Developed springhead emanating from the contact of the Magee Terrace and the underlying Hattiesburg Formation at McNair Springs public park in Section 8, Township 10 North, Range 6 East.



Spring boils in the sand of the active channel of Goodwater Creek emanating from the contact of the Magee Terrace and the underlying Hattiesburg Formation just beneath the stream's alluvium in Section 6, Township 10 North, Range 6 East.



Limonite stained sand and gravel of the Magee Terrace exposed along the highwall of a surface mine near Dry Creek Lake in Section 17, Township 9 North, Range 17 West.



Limonite stained sand and gravel of the Magee Terrace exposed along the highwall of a surface mine near Dry Creek Lake in Section 6, Township 7 North, Range 6 East.



Limonite stained colluvial sands bioturbated with tree roots resting on cross-bedded sand and gravel of the Magee Terrace exposed along the highwall of a surface mine in Section 6, Township 7 North, Range 6 East. Chert gravel (white) is severely weathered and leached.



Close-up of cross bedding in limonite stained sand and gravel of the Magee Terrace exposed along the highwall of a surface mine in Section 6, Township 7 North, Range 6 East.



Ironstone ledges developed along bedding from the leaching of limonite in sands of the Magee Terrace exposed along an eroded highwall of a surface mine in Section 16, Township 10 North, Range 6 East.



Sand, gravels, and manganese oxide stained (purple) kaolinitic clay exposed along an eroded highwall of a surface mine in Section 16, Township 10 North, Range 6 East.

Structural Cross-Section of the Magee South 7.5-Minute Geologic Quadrangle

