MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF GEOLOGY

OPEN-FILE REPORT 264

GEOLOGIC MAP

of the

MERIDIAN SOUTH QUADRANGLE

Lauderdale County, Mississippi

Geology by David E. Thompson, RPG

2014

DESCRIPTION OF MAP UNITS

QUATERNARY HOLOCENE

Qal — ALLUVIUM

Sand, flood plain sands, and silts.

CLAIBORNE GROUP

TERTIARY EOCENE

Tk — KOSCIUSKO FORMATION

Sand, gray to light olive gray, weathers reddish orange to pale yellowish brown, massive to crossbedded, very fine- to very coarse-grained, quartzose, micaceous, locally exhibits scattered weak ledges of limonitic sandstone; interbedded to interlaminated with silt and clay, light olive gray to brownish gray, locally carbonaceous. Locally unconformable at base. The total thickness is estimated to be 170 feet; however, only the lower 25 feet or so are exposed in the southern portion of the quadrangle. Constitutes the Sparta Aquifer.

Twn-Tz — ZILPHA and WINONA FORMATIONS

Zilpha - Clay, gray to brownish black, carbonaceous to lignitic, weathers light gray to reddish pink to white, massive and homogeneous or interbedded to interlaminated with silt and sand, gray to light olive gray, quartzose, micaceous, carbonaceous, locally glauconitic; concretionary siderite and limonite; near surface exposures may exhibit jointing with selenite or limonite infilling. The thickness is variable from a few feet to 60 feet.

Winona - Sand, gray to green, weathers very light gray to reddish orange or dark red, fine- to coarse-grained, quartzose, micaceous, typically glauconitic to very glauconitic, carbonaceous, silty, locally fossiliferous with thin marine shell beds and prints. Surface exposures commonly weather to distinctive contorted, concretionary, limonitic sandstone and sandy ironstone; concretionary siderite, especially near top. Approximately 60 feet thick.

The maximum thickness of the Zilpha/Winona interval is approximately 120 feet, but thins to as little as 50 feet due to overlap or incision by the overlying Kosciusko Formation.

Tt — TALLAHATTA FORMATION

Basic City Member

Clay, silt, claystone, and quartzitic siltstone and sandstone, olive gray to brownish gray, weathersyellowish gray to very light gray or white, carbonaceous with leaf and plant impressions, fucoidal structures are common, locally exhibits marine fossil prints, near surface exposures may exhibit jointing with limonite infilling; claystones typically weather to lightweight and brittle rock with a subconchoidal fracture; interbedded to interlaminated with sand, gray to very light gray, weathers pale yellowish orange to reddish orange, very fine- to medium-grained, unconsolidated, massive to cross-bedded, quartzose, micaceous, carbonaceous, pyritic; also greenish yellow to buff, fine-grained, semi-consolidated, siliceous, glauconitic, and silty. The base is marked by a sandy interval, approximately 20 feet thick, which in outcrop exposures may exhibit quartzitic sandstone characteristics. The total thickness is approximately 120 to 200 feet. Additionally, the unit thins to as little as 120 feet in areas of the quadrangle due to apparent overlap of marine Winona lithologies.

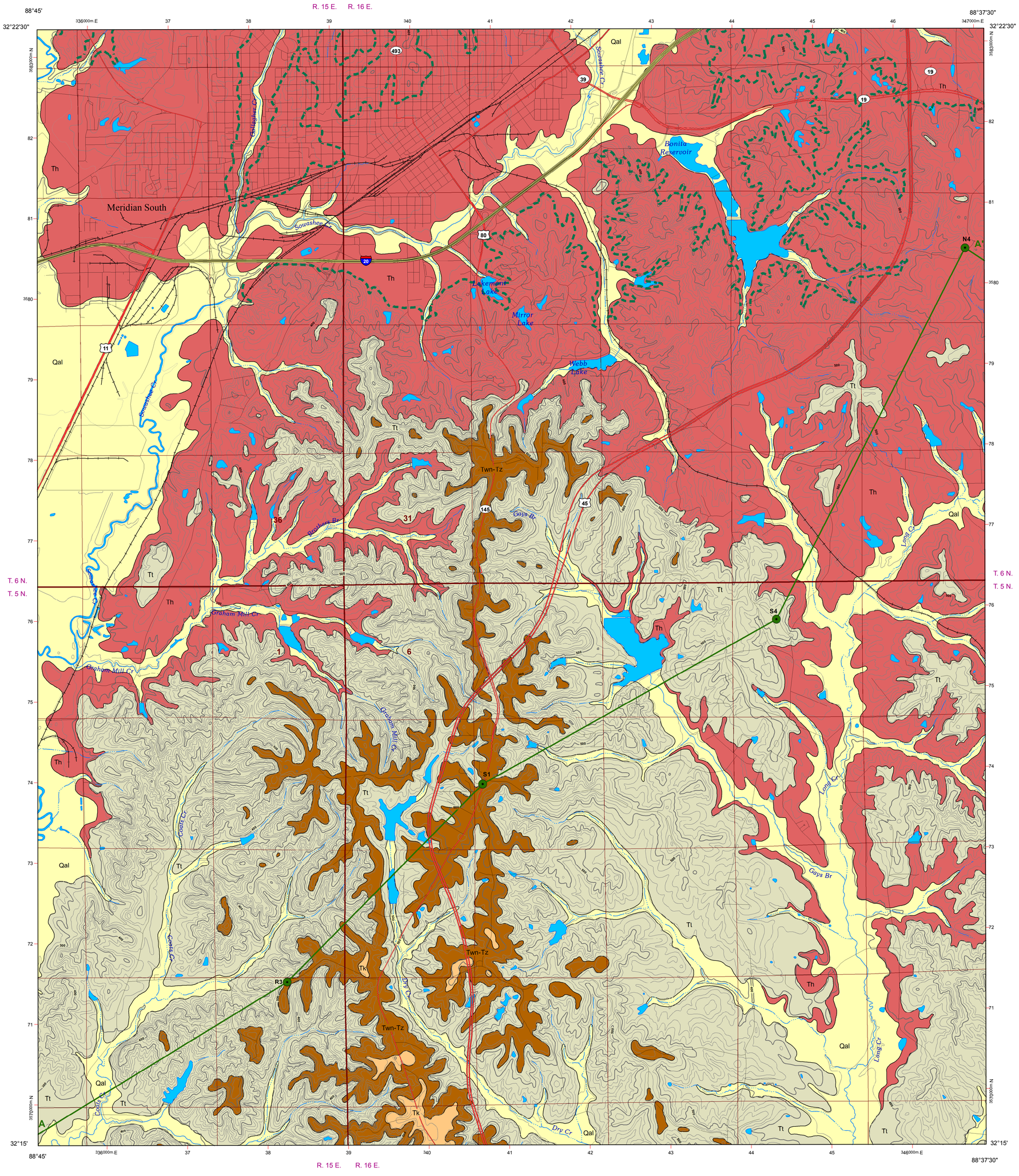
MERIDIAN SAND

Basal portion of the Tallahatta Formation, not differentiated. Sand, gray to very light gray, weathers yellowish gray to reddish orange, very fine- to very coarse-grained, quartzose, micaceous, locally carbonaceous and/or glauconitic, pyritic. The thickness of the Meridian Sand is variable, from 20 to 100 feet. The Meridian Sand constitutes the upper portion of the Meridian/Upper Wilcox Aquifer.

WILCOX GROUP

Th — HATCHETIGBEE FORMATION

Sand, gray to light gray, weathers reddish orange to pale yellowish orange, very fine- to very coarse-grained, quartzose, micaceous, pyritic, clay clast conglomerate; interbedded to interlaminated with clay, gray to brownish gray, weathers very light gray to white, silty, carbonaceous to lignitic, especially argillaceous in the upper beds of the formation; lignite. The basal 150 feet or so are equivalent to the Bashi Formation of east-central Mississippi. The Bashi interval contains at least three distinct greensand marl intervals, with the most notable being the uppermost; a fossiliferous, boulder-bearing horizon at Meridian (designated by a green dashed-line on the geologic map). Sand, gray to light gray, weathers reddish orange to pale yellowish orange, very fine- to very coarse-grained, quartzose, glauconitic, micaceous, carbonaceous, slightly pyritic, locally exhibits fossil prints and/or calcareous fossil remains, commonly weathers to large, limonitic, concretionary masses. The uppermost, fossiliferous, boulder-bearing interval is thought to mark the Paleocene/Eocene unconformity. The greensand marls are typically bounded by silt, clay, or lignite lithologies. The total thickness of the Hatchetigbee interval is approximately 320 feet. The upper 100 feet of the formation may be very sandy locally, and constitutes the basal portion of the Meridian/Upper Wilcox Aquifer.



GEOLOGIC MAP

MERIDIAN SOUTH QUADRANGLE

Lauderdale County, Mississippi

1:24,000

1 0.5 0 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

Geology field checked in 2014 using the 1971, PHOTOREVISED 1982, U.S. Geological Survey 7.5-minute topographic quadrangle, Universal Transverse Mercator projection, 1927 North American datum, Contour Interval 20 feet and supplemental contour interval 10 feet. Universal Transverse Mercator projection, 1983 North American datum. GRS80 spheroid. 1000-meter Universal Transverse Mercator 1983 datum grid ticks, zone 16, shown in red. January 2014, magnetic north declination in quadrangle center is 1°38'28" west of true north, changing by 0°6.9' west per year.

Sources: The base map is derived from the Digital 2012 USTOPO, USGS 1982 contour mylar separate of the USGS topographic quadrangle map, railroad feature, Federal Railroad Administration (FRA), edition 2002, 1:100,000 scale, Public Land Survey System, Mississippi Automated Resource Information System (MARIS), 1:24,000 scale. Declination, National Oceanic and Atmospheric Administration (NOAA).

Geographic Information System by Daniel W. Morse. MDEQ does not warrant the accuracy or completeness of the source data. Geologic maps are only a guide to current understanding and do not eliminate the need for detailed investigations of specific sites for specific purposes.

This map was produced by the Mississippi Office of Geology in cooperation with the United States Geological Survey, National Geologic Mapping Program, under STATEMAP grant #G13AC00234.

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