



DESCRIPTION OF MAP UNITS

QUATERNARY
HOLOCENE



ALLUVIUM
Qal Sand, flood plain sands, and silts.

CLAIBORNE GROUP



KOSCIUSKO FORMATION
Tk 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 interlamated with silt and clay, light olive gray to brownish gray, locally carbonaceous. Locally unconformable at base. The thickness is estimated to be 300 feet, however, only the lower 80 feet or so are exposed in the southwestern portion of the quadrangle. Constitutes the Sparta Aquifer.



ZILPHA and WINONA FORMATIONS
Twn-Tz Zilpha - Clay, gray to brownish black, carbonaceous to lignitic, weathers light gray to reddish pink to white, massive and homogeneous or interbedded to interlamated 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 concretion, 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 this is as little as 40 or 50 feet due to overlap or incision by the overlying Kosciusko Formation.

TERTIARY
EOCENE



TALLAHATTA FORMATION
Basic City Member
Tbc Clay, silt, claystone, and quartzitic siltstone and sandstone, olive gray to brownish gray, weathers yellowish gray to very light gray or white, carbonaceous with leaf and plant impressions, faunal structures are common, locally exhibits marine fossil prints, near surface exposures may exhibit jointing with limonite infilling; claystones typically weather to light gray, massive to crossbedded, interbedded to interlamated with sand, gray to very light gray, weathers pale yellowish orange to reddish orange, very fine- to medium-grained, unconsolidated, massive to crossbedded, 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. Unconsolidated sands in the upper 20 feet or so are termed the Nesheba Sand Member. The total thickness is approximately 220 feet. Additionally, the unit thins to as little as 130 feet in the southeastern area of the quadrangle due to apparent overlap of marine Winona lithologies.

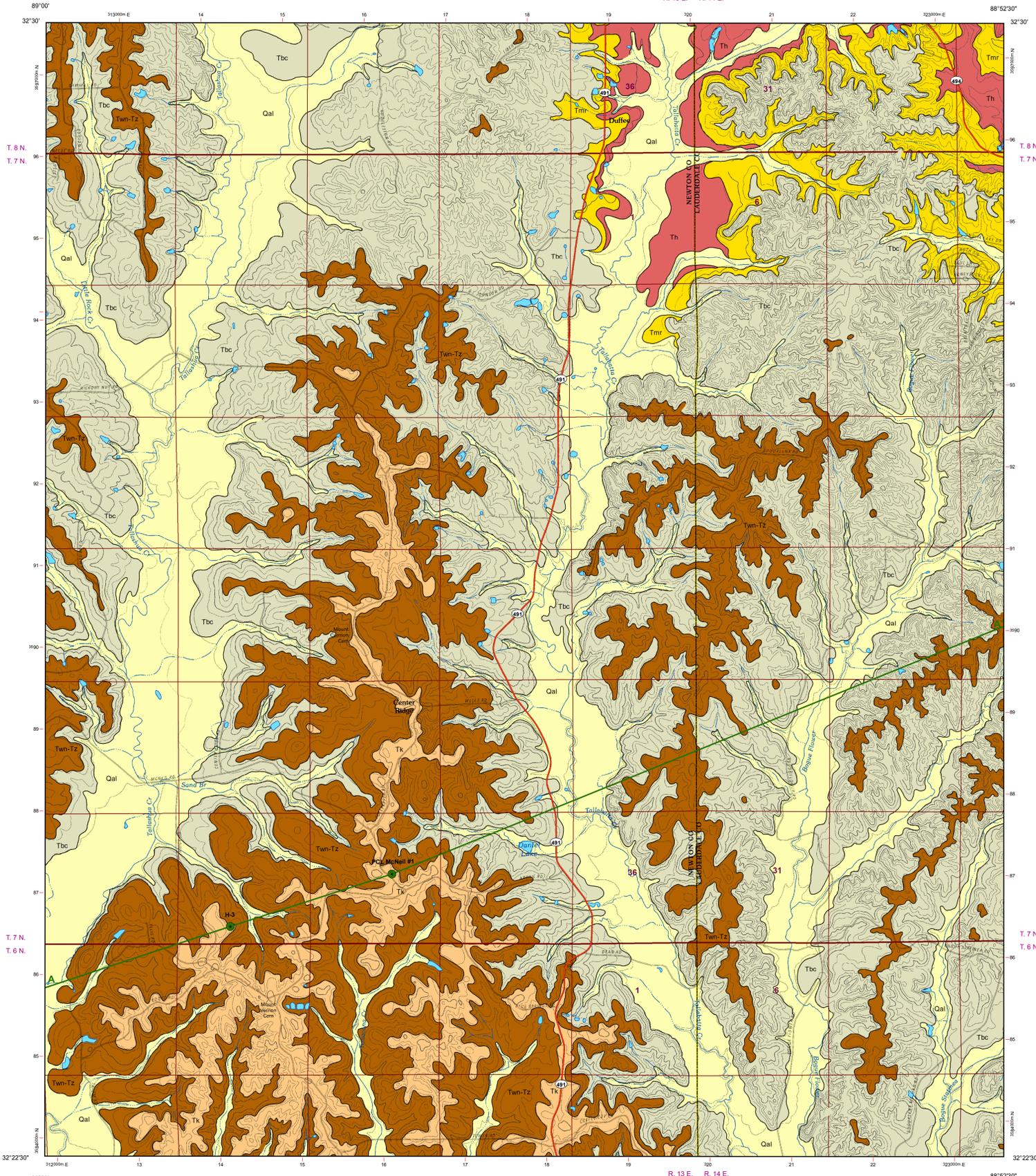
WILCOX GROUP



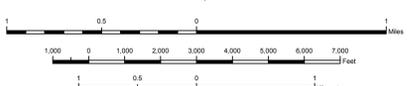
MERIDIAN SAND
Tmr Sand, gray to very light gray, weathers yellowish gray to reddish orange, very fine- to very coarse-grained, typically fining upward, quartzose, micaceous, locally carbonaceous and/or glauconitic, pyritic, interbedded to interlamated with silt, siltstone, and clay, dark gray to white, carbonaceous; the upper beds are typically silty or argillaceous. The maximum thickness is approximately 60 feet. Locally, and especially in down-dip exposures, the Meridian Sand is thin and limited to approximately 20 feet in thickness. Unconformity at base. The Meridian Sand constitutes the basal portion of the Meridian/Upper Wilcox Aquifer.



HATCHETIGBEE FORMATION
Th Sand, gray to light gray, weathers reddish orange to pale yellowish orange, very fine- to very coarse-grained, quartzose, micaceous, pyritic, clay elast conglomeratic, interbedded to interlamated 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 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. 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 thickness of the hatchetigbee Formation is approximately 260 to 340 feet, however only the upper 60 feet or so are exposed in the northeastern portion of the quadrangle. The Hatchetigbee Formation constitutes the basal portion of the Meridian/Upper Wilcox Aquifer.



GEOLOGIC MAP
DUFFEE QUADRANGLE
Newton and Lauderdale Counties,
Mississippi



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Geology field checked in 2012 using the PROVISIONAL EDITION 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 2013, magnetic north declination in quadrangle center is 1°22' west of true north, changing by 0°7' west per year.

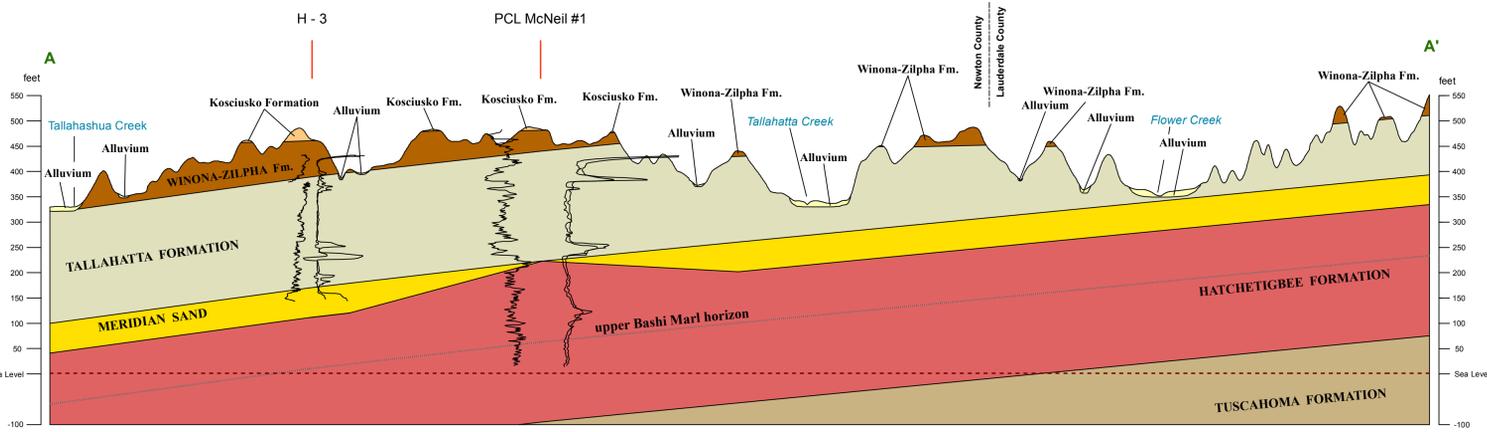
Sources: The base map is derived from the Digital 2012 USTOPO, contour Mylar separate of the USGS 1982 topographic quadrangle; Public Land Survey System from Mississippi Automated Resource Information System (MARIS), 1:24,000 scale. Declination, National Oceanic and Atmospheric Administration (NOAA).

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.

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H - 3 Drill-hole locality and identification number

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



Vertical Exaggeration X 15