



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF GEOLOGY

OPEN-FILE REPORT 366

### GEOLOGIC MAP

of the

### SPARTA QUADRANGLE

Chickasaw and Clay Counties, Mississippi



Geology by  
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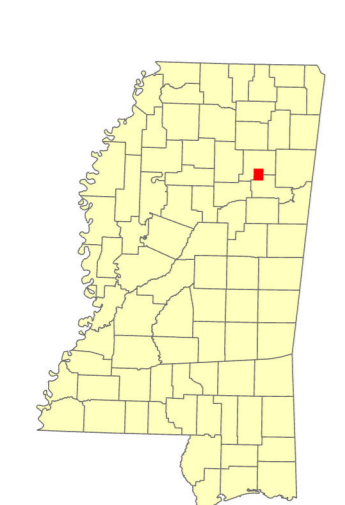
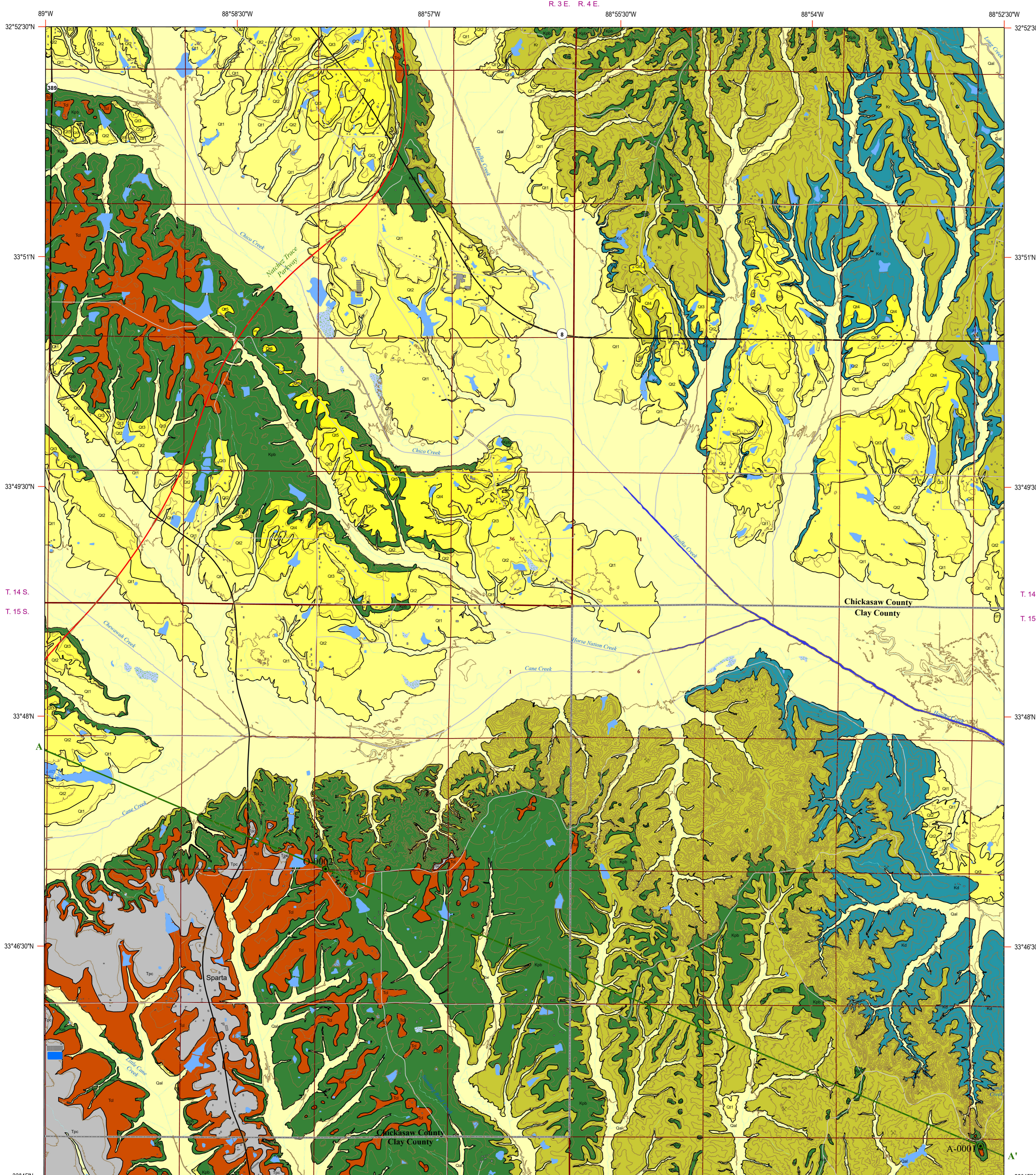


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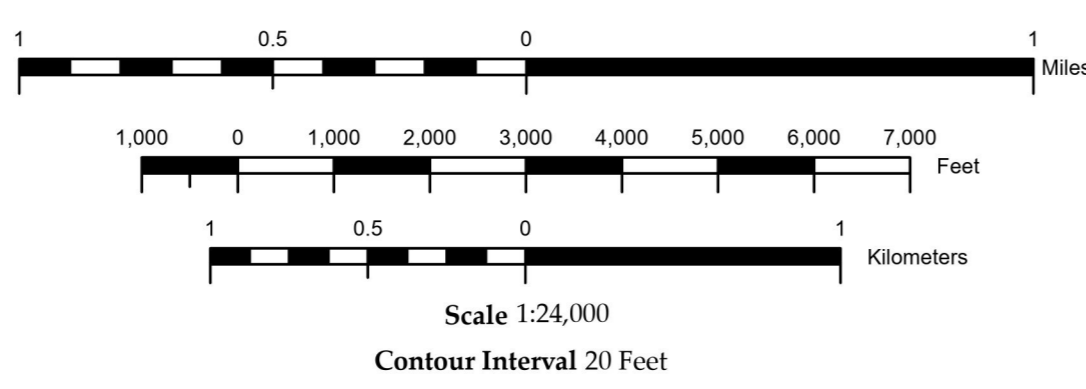
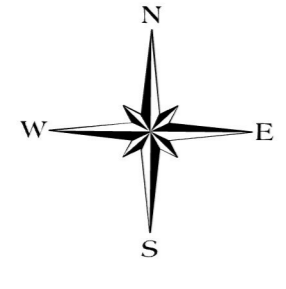
#### DESCRIPTION OF MAP UNITS

EPOCH	FORMATION	Symbol	DESCRIPTION	
QUATERNARY	HOLOCENE	Qal	<b>ALLUVIUM</b> Floodplain deposits of clay, silt, and quartz sand. Generally gray, yellowish-orange, orange, and tan, commonly contains organic matter. Approximately 25 feet thick along larger streams, thinning up tributaries.	
		PLEISTOCENE	Q1	<b>TERRACE ALLUVIUM</b> Abandoned floodplain deposits of clay, silt, and quartz sand. Generally yellowish-orange, orange, and tan, may contain organic matter. Approximately 20 feet thick adjacent to larger stream Alluvium or younger terrace deposits, thinning or non-existent up tributaries. Q1 - youngest and lowest in elevation of Terrace alluvium deposits. Q2 - second youngest in age and elevation of Terrace alluvium deposits. Q3 - third youngest in age and elevation of Terrace alluvium deposits. Q4 - fourth youngest in age and elevation of Terrace alluvium deposits that is more eroded and discontinuous. Q5 - fifth youngest in age and elevation of Terrace alluvium deposits that is more eroded and discontinuous. The older in age and higher in elevation Terrace alluvium deposits become increasingly eroded and discontinuous.
			Q2	
			Q3	
			Q4	
PALEOGENE	PALEOCENE	Tpc	<b>PORTERS CREEK FORMATION</b> Clay, gray, weathers tan to brown. Conformable with the underlying Clayton Formation. Clay marl at the base in places. Total thickness ranges up to approximately 25 feet.	
		Tcl	<b>CLAYTON FORMATION</b> Sands massive to cross-bedded, red and dark red to reddish-brown, medium to coarse grained quartz, somewhat silty and clayey. Unconformable with, and in places incised into underlying Prairie Bluff Formation. Limestone near or at the base. Thickness ranges up to approximately 30 feet.	
		Kpb	<b>PRAIRIE BLUFF FORMATION</b> Clay marl with some beds of chalk, blue to gray, weathers white, massive, silty; very fossiliferous, phosphatic molds at the base, interlamated thinly bedded calcareous glauconitic sands in the south. Sand, sandstones and sandy marl are present near the top in places. Total thickness ranges up to approximately 80 feet. Unconformably overlies the Ripley Formation.	
CRETACEOUS	UPPER CRETACEOUS	Kr	<b>RIPLEY FORMATION</b> Clay in lower portion conformably transitioning from underlying Demopolis Chalk. Sand, chalk and limestone above the transitional clay. Transitional clay is laminated to thin bedded; dark greenish gray, medium gray and reddish tan where highly weathered; locally sandy; and fossiliferous. Sand, chalk and limestone are interbedded. Lenses of sand, chalky sand, silty chalk or chalky limestone occur in some places. Sands are tan to red where weathered; fine grained; micaceous; calcareous; and fossiliferous. Chalks are gray to tan; often silty and sandy; and fossiliferous. Limestones are light gray to nearly white where weathered; often sandy; and fossiliferous. A coarse grain, tan to brown fossiliferous sand, indurated at places. Total thickness ranges up to approximately 110 feet.	
		Kd	<b>DEMOPOLIS CHALK</b> Massive-bedded chalk and marly chalk. Medium to light gray and bluish-gray, weathers to tan. Contains subordinate amounts of pyrite, glauconite, and mica. Fossiliferous in many locations. Thickness ranges up to approximately 450 feet.	

- A-0001 Drill Hole Locality and Identifier
- Surface Mine



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SPARTA  
QUADRANGLE  
Chickasaw and  
Clay Counties,  
Mississippi



Geology field checked in 2017, 2024 and 2025 using the 1987 U.S. Geological Survey 7.5-minute topographic quadrangle, Universal Transverse Mercator projection, 1927 North American datum, 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. 1995, magnetic north declination in revised quadrangle center is 2.14° W ± 0.34' changing by 0.07° W per year.

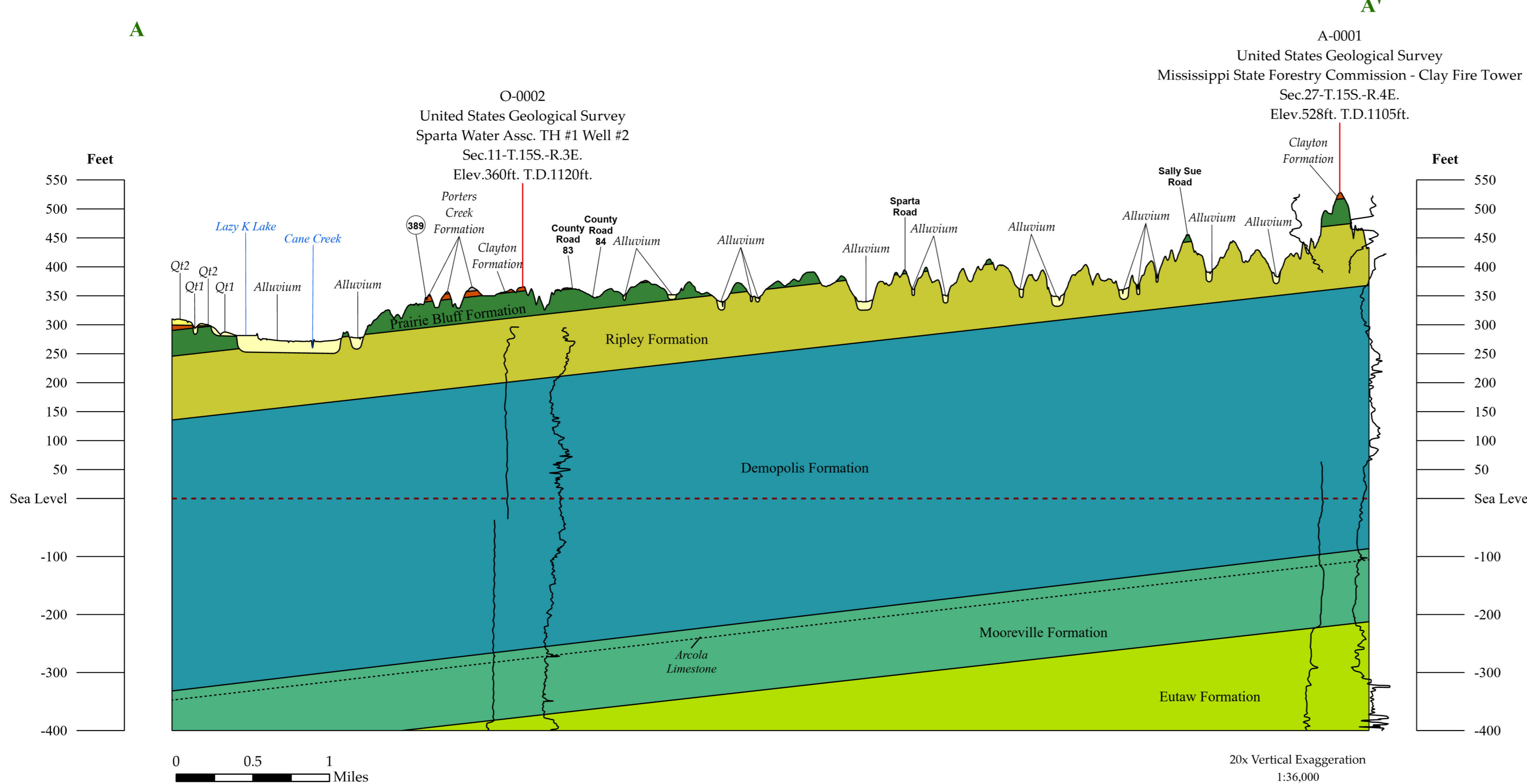
Sources: Contours obtained from Mississippi Automated Resource Information System (MARIS), Public Land Survey System, 1:24,000 scale, railroad features, highway features, and hydrologic information from MARIS. We thank the National Park Service and Mississippi State University for their cooperation and for facilitating the data collection and fieldwork necessary for this mapping project. Public Land Survey System from MARIS, 1:24,000 scale. Lidar from Brad Segrest & Barbara Yassin of The Mississippi Department of Environmental Quality (MDEQ), Natural Resources Conservation Service, National Oceanic and Atmospheric Administration, United States Army Corps of Engineers, and MARIS. Building Footprint data is licensed by Microsoft under the Open Data Commons Open Database License (ODbL). Surface mine locations from MDEQ Office of Geology - Mining and Reclamation Division and USGS.

Geographic Information System by Darrel Schmitz, RPG, PhD, and Rayford Parnell, Mississippi State University, and Jonathan R. Leard, RPG, PhD, MDEQ Office of Geology-Surface Mapping Division. 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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## Structural Cross-Section of the Sparta 7.5-Minute Geologic Quadrangle



2009-2018 Mississippi Statewide LIDAR-Generated DEM and Hill Shade