

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY  
 OFFICE OF GEOLOGY  
 OPEN-FILE REPORT 233  
**GEOLOGIC MAP**  
 of the  
**AVALON QUADRANGLE**  
 Grenada, Carroll, and Leflore  
 Counties, Mississippi  
 Geology by David E. Thompson, RPG



2010

**DESCRIPTION OF MAP UNITS**

- |              |   |  |  |
|--------------|---|--|--|
| QUATERNARY   | HOLOCENE                                | <b>ALLUVIUM</b><br>Qal   | Sand, flood plain sands, silts, and gravels. Also includes unmapped Pleistocene, Late Wisconsin Stage, Valley Train Deposits (Saucier, 1994), along the eastern flank of the Mississippi River Valley.   |
|              | WISCONSINAN                             | <b>ALLUVIAL FANS</b><br>Qaf  | Silts, sands, and gravels. Fan-shaped deposits of water-transported material, derived largely from bluff sediments (Loess and Pre-Loess Terrace Deposits). Typically develop at the base of topographic features where there is a prominent break in slope. Coarser-grained sediments tend to predominate closer to the bluff-line mouth, while finer-grained silts tend to be more prevalent along fan edges. Maximum fan thickness is near the bluff-line mouth, along the crest, and is estimated at 30 to 50 feet in some instances. Thickness typically decreases away from the bluff-line mouth, toward the outer edges.   |
|              |   | <b>LOESS</b><br>Ls   | Silt, buff to tan, pale yellow, red, or gray, sandy to clayey, quartzose, feldspathic. Unweathered loess is typically calcareous with dolomite and calcite, and is present in thicker accumulations near the bluff-line. Thinner accumulations of loess, eastward of the bluff-line tend to be highly weathered, leached, noncalcareous, very clayey, and have been referred to as a brown or yellow loam. Loess is an eolian deposit derived from glacial outwash. Loess deposits blanket the pre-loess topography of the quadrangle area, with greater quantities developed along ridge crests than in valleys, creating local variation in thickness. The thickness in the quadrangle is estimated at 10 to 60 feet. In places, weathered loess contains secondary deposits of small calcareous concretions (caliche, loess dells). |
|              | PLEISTOCENE                             | <b>PRAIRIE TERRACE DEPOSITS</b><br>Op  | Fluvial sediments deposited during the Sangamon interglacial period via east-west trending tributaries of the ancestral Mississippi River system, when sea level stood higher than at present. Constructional alluviation preserved stratified lithofacies of mixed composition, including sand (predominantly quartz), silt, clay, and gravel. Elevation generally 10 to 30 feet above modern stream level.   |
| PRE-SANGAMON | <b>PRE-LOESS TERRACE DEPOSITS</b><br>Qt | Sand, dark red, reddish orange, pink, bright yellowish brown, brown, and occasionally white, fine- to very coarse-grained, predominantly quartzose, locally micaceous, poorly sorted and massive to well sorted and cross-bedded; typically graveliferous with quartz and chert pebbles, especially at base. Commonly exhibits clay silt conglomerate with purplish red to white, kaolinitic, rip-up clasts. Locally interbedded with clay, light gray to purplish red to white, kaolinitic, plastic. Locally contains irregular layers of hematitic to limonitic sandstone. Unconformity at base, with an irregular, undulating surface. Roughly corresponds to the Laceyite Formation, Brown (1907); the Citronelle Formations, Priddy (1942); the Bentley Terrace, Fisk et al. (1949); and the Upland Complex, Saucier (1994). The thickness in the quadrangle is estimated at a few feet up to 100 feet. |  |
|              | <b>KOSCIUSKO FORMATION</b><br>Tk        | Sand, gray to light olive gray, weathers reddish orange to pale yellowish brown, very fine- to very coarse-grained, quartzose, micaceous; interbedded to interlamated with silt and clay, light olive gray to brownish gray, carbonaceous to lignitic; especially argillaceous in upper third of the formation. Locally, the basal Kosciusko contains layers of quartzitic, siliceous siltstone and sandstone as thick as 5 feet, often occurring as large boulders along hill tops and slopes. Unconformity at base. The thickness is estimated to be 300 feet; however, only about 100 ft. of the lower half are exposed in the quadrangle. Constitutes the Sparta Aquifer.  |  |

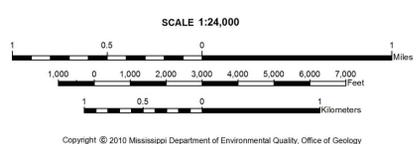
B-7  
 ● Drill-hole locality and identification number

**REFERENCES CITED**

Brown, C. S., 1907, Lignite of Mississippi: Mississippi Geological Survey, Bulletin 3, 72 p.  
 Fisk, H. N., et al., 1949, Geological investigation of gravel deposits in the lower Mississippi Valley and adjacent uplands: Mississippi River Commission, Corps of Engineers, U. S. Waterways Experiment Station Technical Mem. 5-273, 28 p.  
 Priddy, R. R., 1942, Geology, p. 11-106, in Priddy, R. R. and E. E. McCutcheon, Tallahatchie County mineral resources: Mississippi Geological Survey, Bulletin 50, 157 p., 2 pl.  
 Saucier, R. T., 1994, Geomorphology and Quaternary geologic history of the lower Mississippi Valley: U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi, v. 1, 364 p., Appendix A, 23 p., Appendix B, 11 p., v. 2, 28 pl.



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Geology field checked in 2010 using the 1962, U.S. Geological Survey 7.5-minute topographic quadrangle, 1963 North American datum; contour interval 5 and 20 feet, 1000-meter Universal Transverse Mercator grid ticks, zone 15, 1983 datum shown in red.  
 Sources: The base map is derived from a Digital Raster Graphic of the USGS topographic quadrangle map. 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 #059AC00173.

**Structural Cross-Section of the Avalon 7.5-Minute Geologic Quadrangle**

