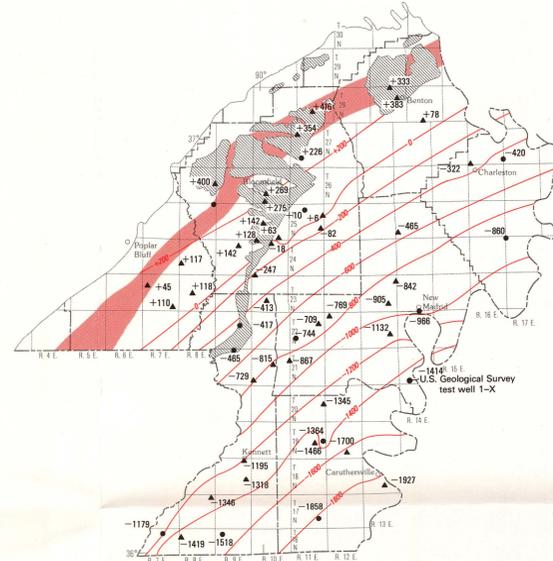


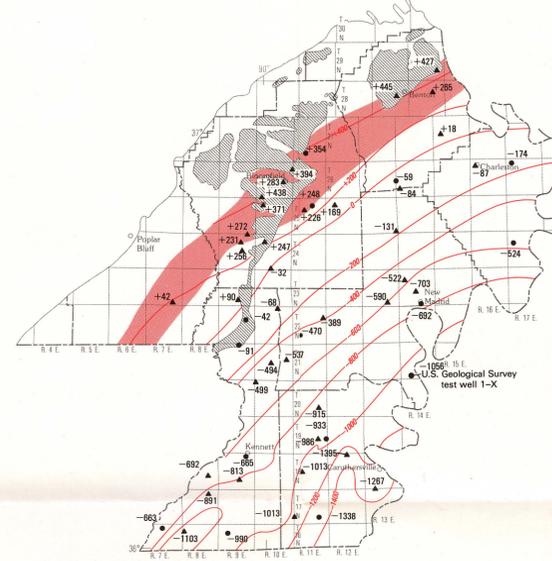
**PALEOZOIC ROCKS UNDIFFERENTIATED**

The bedrock underlying southeast Missouri is at least Ordovician in age. At the U.S. Geological Survey test well 1-X, Cambrian rocks were in contact with the overlying McNairy Formation. The bedrock is distinct on geologic and geophysical logs and consists mainly of dolostone.



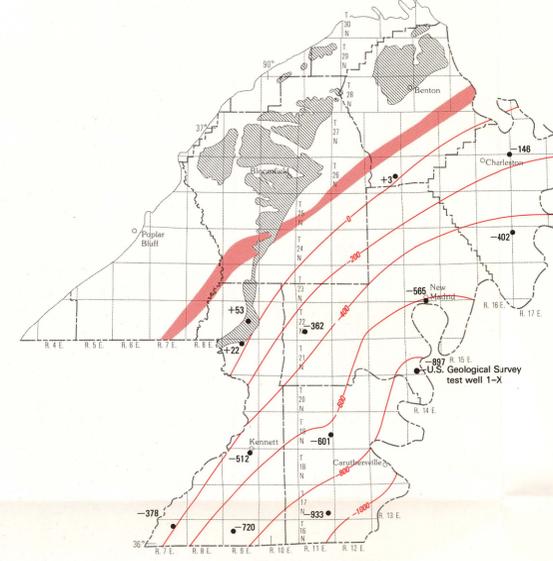
**UPPER CRETACEOUS ROCKS UNDIFFERENTIATED**

The unit overlying the McNairy Sand is the Owl Creek Formation. It generally consists of clay and silt. The McNairy Sand is a distinct sand unit with interbedded clay layers. These clay layers appear to be mappable units. The main material in the McNairy Sand is a white, fine-grained sand.



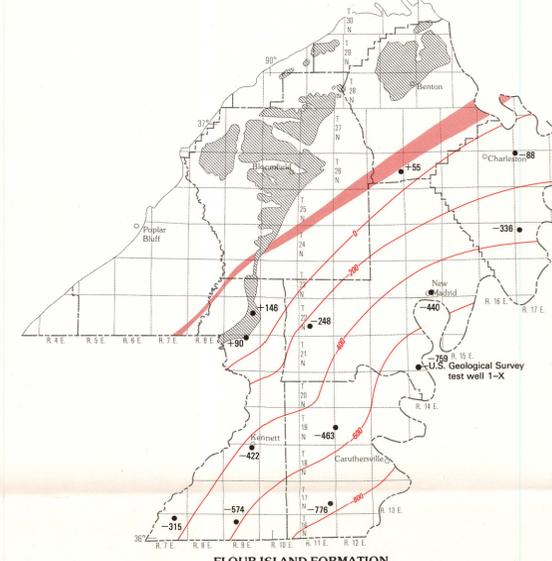
**MIDWAY GROUP**

The Midway Group is comprised in ascending order of the Clayton Formation, the Porters Creek Clay, and possibly the Old Breastworks (?) Formation (Fredericksen and others, 1982), and may be in excess of 650 feet thick in southeast Missouri. The Clayton Formation is the basal unit and is a glauconitic clay and marl. The Porters Creek Clay is a massive clay unit that is a regional confining bed in the Mississippi embayment. The Old Breastworks (?) Formation overlies the Porters Creek Clay and its presence is questioned in southeast Missouri and its assignment to the top of the Midway Group is tentative.



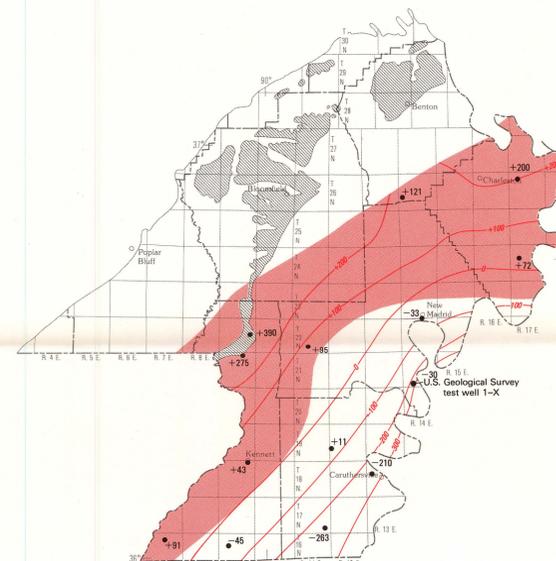
**FORT PILLOW SAND**

The Fort Pillow Sand is a distinct sand body in the entire study area. The unit is easily recognizable as being the first major sand body encountered above the Midway Group.



**FLOUR ISLAND FORMATION**

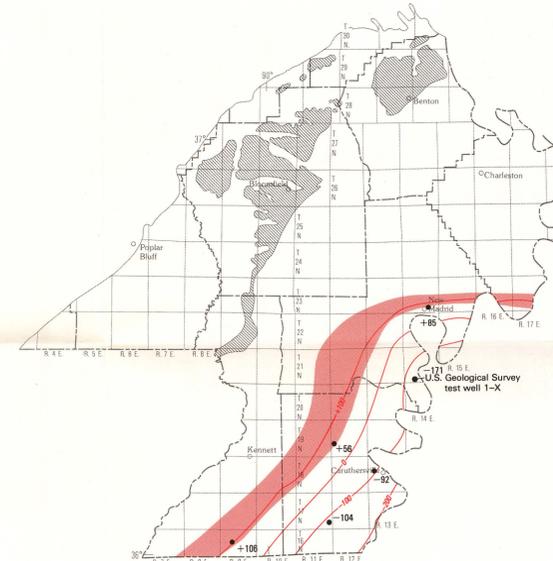
Flour Island Formation is a silt and clay unit that contains some sand. The unit is thin, averaging less than 100 feet in most places. In the northern part of the study area, the unit becomes sandy and appears almost continuous with the overlying Memphis Sand and the underlying Fort Pillow Sand.



**MEMPHIS SAND**

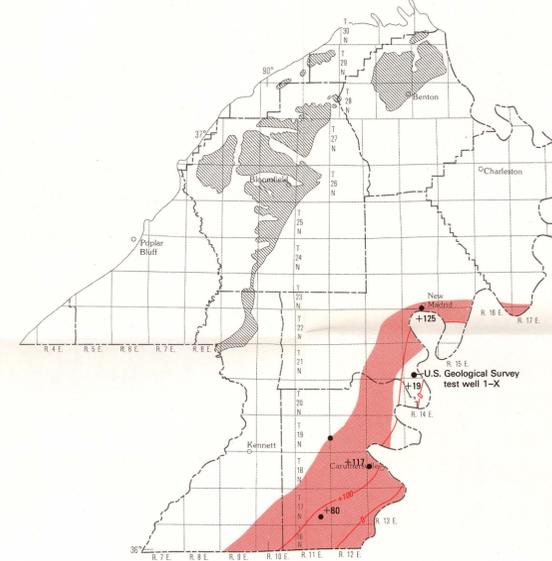
The Memphis Sand underlies the Cook Mountain Formation and subcrops under the alluvium in a wide band ranging from just west of Crowley's Ridge in southern Missouri to north of Charleston, Missouri. The unit may be found on top of the southern part of Crowley's Ridge in Missouri. The unit is a thick sand body which was believed, at one time, to be part of the lower Wilcox Group.

The unit consists mainly of sand with some clay units near the top, which may be confused with the clay of the Cook Mountain Formation. As the Memphis Sand thins near Crowley's Ridge, the clay content increases.



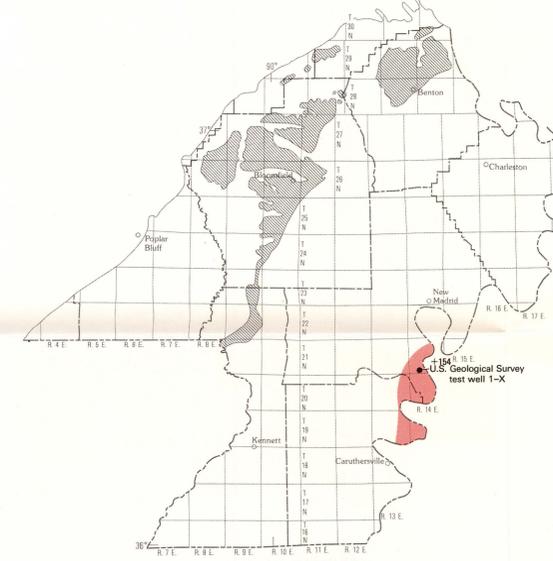
**COOK MOUNTAIN FORMATION**

The Cook Mountain Formation underlies the Cockfield Formation and subcrops under the alluvium in a band from east of Cardwell, Missouri, to north of New Madrid, Missouri. The unit appears to be mainly silt and clay, but does contain sand and lignite. In the northern part of the study area, the unit is very sandy with lesser quantities of silt and clay.



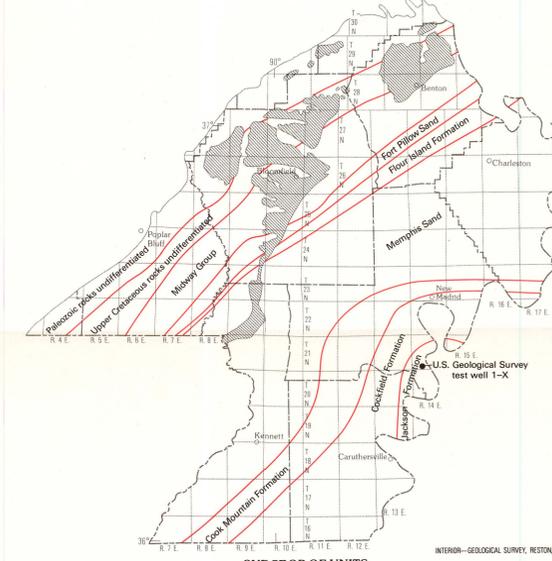
**COCKFIELD FORMATION**

The Cockfield Formation underlies the Jackson Formation and subcrops under the alluvium in a narrow band approximately parallel to the Mississippi River. The unit contains sand and clay with abundant lignite. The lower part of the unit may have lignite in discrete beds. The top of the unit may be eroded in places.



**JACKSON FORMATION**

The Jackson Formation, where it is present, directly underlies the alluvium. The unit has been identified in the U.S. Geological Survey test well 1-X in New Madrid County, Missouri, on the basis of sporomorphs and lithologic evidence. The unit is sand with interbedded silt and clay. The contact between the overlying alluvium and the Jackson Formation usually is identifiable by the presence of coarse sand and large gravel.



**SUBCROP OF UNITS**

- Crowley's Ridge—Outcrop of Paleozoic, Cretaceous, Tertiary, and Quaternary units (modified from Anderson, 1979)
- Subcrop of Unit—Area where top of unit directly underlies alluvium
- Structure contour—Shows altitude of top of indicated unit. Contour interval, in feet, is variable. National Geodetic Vertical Datum of 1929
- Control point, geophysical data—Number is top of unit, in feet, above or below National Geodetic Vertical Datum of 1929
- Control point, geologic data—Number is top of unit, in feet, above or below National Geodetic Vertical Datum of 1929



**Structural configuration of stratigraphic units**  
**SUBSURFACE GEOLOGY OF PALEOZOIC, MESOZOIC, AND CENOZOIC UNITS IN SOUTHEAST MISSOURI**

By  
**T.O. Mesko**  
1988