

- EXPLANATION**
- Outcrop area of Ozark confining unit
  - Outcrop area of rocks comprising geohydrologic units older than Ozark confining unit
  - Area where Ozark confining unit and stratigraphically equivalent units are missing in the subsurface
  - Contact
  - Fault—U, upthrown side, D, downthrown side
  - Approximate boundary of Ozark Plateaus aquifer system
  - Structure contour—Shows altitude of top of Ozark confining unit. Contours in areas of few control points are consistently with contours and underlying geohydrologic units. Contours in outcrop areas are modified from 1:500,000 scale. Missouri, Arkansas, and Oklahoma State base maps. Hachures indicate depression. Contour interval, in feet, is variable. National Geodetic Vertical Datum of 1929
  - Structure contour—Shows altitude of top of the next stratigraphically lower geohydrologic unit where the Ozark confining unit is missing in the subsurface. Hachures indicate depression. Contour interval, in feet, is variable. National Geodetic Vertical Datum of 1929
  - Control data point—Part of Central Midwest Regional Aquifer System Analysis data base. Number is altitude, in feet, of the top of Ozark confining unit. National Geodetic Vertical Datum of 1929
  - Auxiliary control data point<sup>1</sup>
- <sup>1</sup>Contours and control points beyond the approximate boundary of the Ozark Plateaus aquifer system are for units stratigraphically equivalent to those that comprise the Ozark Plateaus aquifer system.

**INTRODUCTION**

An investigation of the geohydrologic system in the Ozark Plateaus province (index map and Forman, 1938) has been made as part of the Central Midwest Regional Aquifer System Analysis (Jorgensen and Sogor, 1961), a major study that encompasses parts of 10 States. The study is one of several by the U.S. Geological Survey that are designed to increase knowledge of the flow regime and geohydrologic properties of regional aquifer systems in the United States. Because a large amount of fresh ground water is available in aquifers underlying the Ozark Plateaus province, a regional project has been established to study the geohydrologic units of this area in more detail than is practical in the regional study. The stratigraphic relationships among the primary geohydrologic units in the Ozark Plateaus province are discussed in Chapter A of this Hydrologic Investigations Atlas series. This chapter focuses on the Ozark confining unit, a geohydrologic unit within the Ozark Plateaus aquifer system underlying the Ozark Plateaus province.

**THE OZARK CONFINING UNIT**

**DEFINITION**

The Ozark confining unit, the uppermost confining unit in the Ozark Plateaus aquifer system, is composed of a sequence of geologic units that range stratigraphically from the Upper Ordovician, Maquoketa Shale to the Lower Mississippian, Chouteau Limestone. All of the geologic units in this confining unit are not present everywhere in the Ozark Plateaus province. Commonly, in the western and southern part of the province, only Upper Devonian shale and Lower Mississippian shale and limestone contribute to the confining unit. In extreme eastern Missouri, Ordovician, Silurian and Devonian formations are included as part of the confining unit. It is probable that some of these formations in eastern Missouri, several of which are thick limestone, constitute the western edge of another geohydrologic unit that may be an important water-yielding unit east of the Ozark Plateaus, but due to the relatively small areal extent of these formations in the Ozark Plateaus province, they have not been delineated as a separate geohydrologic unit. The Ozark confining unit is named for its stratigraphic position relative to the underlying Ozark aquifer (see Chapter E).

**GENERALIZED STRATIGRAPHIC COLUMN SHOWING GEOLOGIC FORMATIONS THAT COMPRISE THE OZARK CONFINING UNIT.**

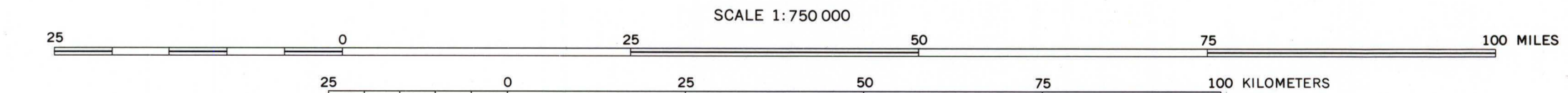
SYSTEM	SOUTHWESTERN MISSOURI	SOUTHEASTERN MISSOURI	SOUTHWESTERN KANSAS	NORTHEASTERN OKLAHOMA	NORTHERN ARKANSAS	LOCATIONS
MISSISSIPPIAN	Fort St. Vrain Limestone	Fort St. Vrain Limestone	Fort St. Vrain Limestone	Fort St. Vrain Limestone	Fort St. Vrain Limestone	Fort St. Vrain
	Chouteau Limestone	Chouteau Limestone	Chouteau Limestone	Chouteau Limestone	Chouteau Limestone	Chouteau
	Maquoketa Shale	Maquoketa Shale	Maquoketa Shale	Maquoketa Shale	Maquoketa Shale	Maquoketa
	St. Louis Limestone	St. Louis Limestone	St. Louis Limestone	St. Louis Limestone	St. Louis Limestone	St. Louis
	St. Francois Limestone	St. Francois Limestone	St. Francois Limestone	St. Francois Limestone	St. Francois Limestone	St. Francois
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PALEOZOIC	Chouteau Limestone	Chouteau Limestone	Chouteau Limestone	Chouteau Limestone	Chouteau Limestone	Chouteau
	St. Louis Limestone	St. Louis Limestone	St. Louis Limestone	St. Louis Limestone	St. Louis Limestone	St. Louis
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ORDOVICIAN	St. Francois Limestone	St. Francois Limestone	St. Francois Limestone	St. Francois Limestone	St. Francois Limestone	St. Francois
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**STRUCTURAL FEATURES**

The Ozark confining unit crops out in a thin strip that surrounds the outcrop area of the underlying Ozark aquifer. It dips gently to the west in Kansas and western Missouri at about 14 feet per mile. The rate of dip increases in northeastern Oklahoma along the western and southern edges of a ridge extending from southern Missouri through Benton County, Arkansas, to Sequoyah County, Oklahoma. The line of maximum increase of dip in northeastern Oklahoma marks a transition zone between fresh water in the underlying Ozark aquifer and saline water in stratigraphically equivalent rocks to the west and south. Because the Ozark aquifer is assumed to terminate at the transition zone, so does the Ozark confining unit. In Arkansas the confining unit dips fairly uniformly to the south at about 160 feet per mile.

The confining unit is missing from the subsurface in small localities in Cherokee County, Kansas and Ottawa County, Oklahoma, and in northern Arkansas. The absence of the confining unit in the westernmost and southernmost areas probably is due to nondeposition of the relatively thin geologic formations that comprise the confining unit in those areas. It also is not present in the subsurface throughout a large area in the northern part of the Ozark Plateaus province (Gasconade County, Missouri and vicinity) and throughout the Mississippi Alluvial Plain. In the latter area, the confining unit was removed by erosion before younger formations were deposited.

Based on U.S. Geological Survey  
State base maps, 1:500,000; Arkansas, 1967;  
Kansas, 1962; Missouri, 1972; Oklahoma, 1972



Altitude of top of Ozark confining unit

**MAJOR GEOHYDROLOGIC UNITS IN AND ADJACENT TO THE OZARK PLATEAUS PROVINCE, MISSOURI, ARKANSAS, KANSAS, AND OKLAHOMA—OZARK CONFINING UNIT**

By  
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