

CONVERSION FACTORS

Multiply inch-pound unit	By	To obtain metric unit
foot	0.3048	meter
mile	1.609	kilometer
gallon per minute	0.06308	liter per second
gallon	3.785	liter
cubic foot per second	0.02832	cubic meter per second
square mile	2.590	square kilometer

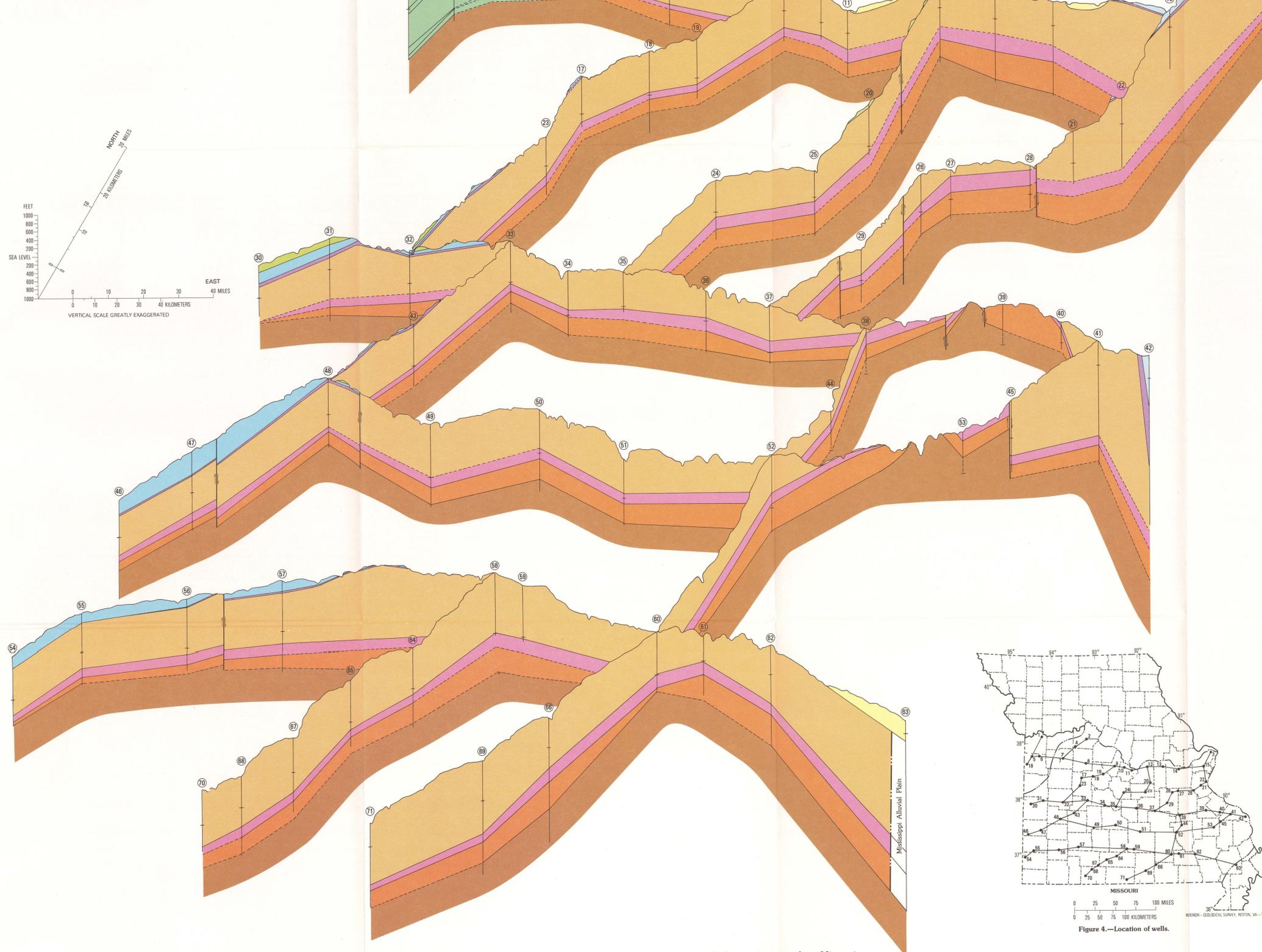


Figure 3.—Relative thickness and stratigraphic position of geohydrologic units in southern Missouri.

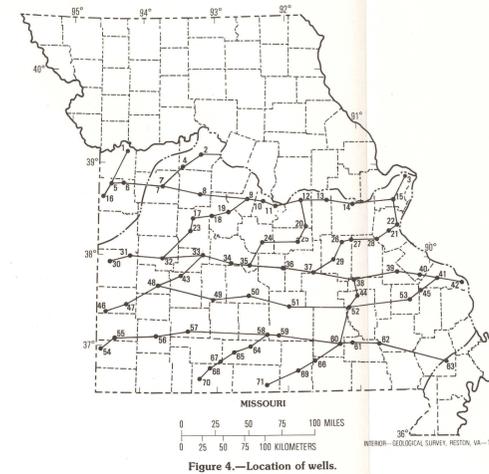


Figure 4.—Location of wells.

RELATIVE THICKNESS AND STRATIGRAPHIC POSITION OF GEOHYDROLOGIC UNITS IN SOUTHERN MISSOURI

Relative thickness and stratigraphic position of geohydrologic units in southern Missouri are shown in figure 3. This figure shows, in three dimensions, the structural and stratigraphic relations between geologic or geohydrologic units. The locations of the 71 wells used to construct the fence diagram are shown in figure 4. A sequential number is used to correlate the position of each well on the well-location map (fig. 4) to the well locations on the fence diagram (fig. 3). The coordinate axes of the diagram are constructed at a 60° angle to separate more northerly (background) data from more southerly (foreground) data. The horizontal axis is scaled to about 12 miles per inch and the rotated vertical axis is scaled to about 6 miles per inch. North is aligned parallel to the rotated vertical axis. Datum for each well (marked by a horizontal bar) is sea level.

Water-bearing rocks of the southern Missouri Ozark Plateaus province are underlain by relatively impermeable Precambrian rocks of undetermined thickness. These rocks constitute the Basement confining unit in the Ozarks. The thickness of the overlying Ozark Plateaus aquifer system ranges from 0 feet in the St. Francois Mountains where the Basement confining unit is exposed at land surface (near wells 39 and 53) to more than 4,000 feet in the Mississippi Alluvial Plain (well 63). Sandstone and dolomite form the basal unit of the Ozark Plateaus aquifer system. This water-bearing unit, the St. Francois aquifer, is about 300 to 500 feet thick in south-central Missouri, but gradually thins to the west.

The St. Francois aquifer yields large quantities of water (100 to 500 gallons per minute). However, because it generally is deeply buried and overlain by the permeable Ozark aquifer, the St. Francois aquifer normally is not used as a source of domestic or municipal water supply, except in the immediate vicinity of the St. Francois Mountains, where the aquifer crops out. The St. Francois confining unit, a near 0 to about 500 feet thick dolomite and shale unit, confines the St. Francois aquifer and separates the St. Francois aquifer from the Ozark aquifer.

The thickest and largest of the five geohydrologic units that comprise the Ozark Plateaus aquifer system is the Ozark aquifer. The water-bearing dolomite and sandstone unit has a nearly uniform thickness of about 1,000 feet throughout much of the region and has a thickness greater than 3,000 feet in Perry, Cape Girardeau, and Scott Counties (near well 42). The unit thins near the St. Francois Mountains. The Ozark aquifer is the primary source of ground water in southern Missouri because it is the shallowest aquifer in most of the about 400 feet thick undifferentiated Pennsylvanian rocks, which are about 150 feet thick and stratigraphically equivalent to the Western Interior Plains confining system, confine a small part of the Ozark aquifer in the north-central part of the Salem Plateau (near wells 12, 13, and 20).

In the western and extreme eastern parts of the province, the Ozark aquifer is confined by the thin Ozark confining unit. In the west, this confining unit separates the Ozark aquifer from the overlying Springfield Plateau aquifer, a permeable, water-bearing limestone that thickens to the west. Maximum thickness of the Springfield Plateau aquifer in southern Missouri is about 400 feet and occurs near well 47. The aquifer yields adequate quantities of water for domestic and stock supply, but municipal-supply wells usually are open only to the deeper Ozark aquifer to utilize the generally larger yield available from the Ozark aquifer.

In the northwestern part of southern Missouri, Pennsylvanian shale, sandstone, and limestone comprise the eastern edge of the Western Interior Plains confining system. The thickness of this confining system is as much as 800 feet (well 5) in southern Missouri and may exceed 20,000 feet in the Interior Plains west of Missouri. The unit confines the underlying Western Interior Plains aquifer system (wells 1, 5, 6, and 16), a saline-water-flow system that extends from the Rocky Mountains to western Missouri (Jorgensen and others, in press). The confining system also covers part of the Springfield Plateau aquifer along a narrow band at the western edge of the Ozark Plateaus aquifer system (wells 2, 4, 7, 30, and 31). The part of the confining system that confines the Springfield Plateau aquifer is no more than about 400 feet thick. Undifferentiated Pennsylvanian rocks, which are about 150 feet thick and stratigraphically equivalent to the Western Interior Plains confining system, confine a small part of the Ozark aquifer in the north-central part of the Salem Plateau (near wells 12, 13, and 20).

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Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geoidetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level of 1929."

AREAL EXTENT, STRATIGRAPHIC RELATION, AND GEOHYDROLOGIC PROPERTIES OF REGIONAL GEOHYDROLOGIC UNITS IN SOUTHERN MISSOURI

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