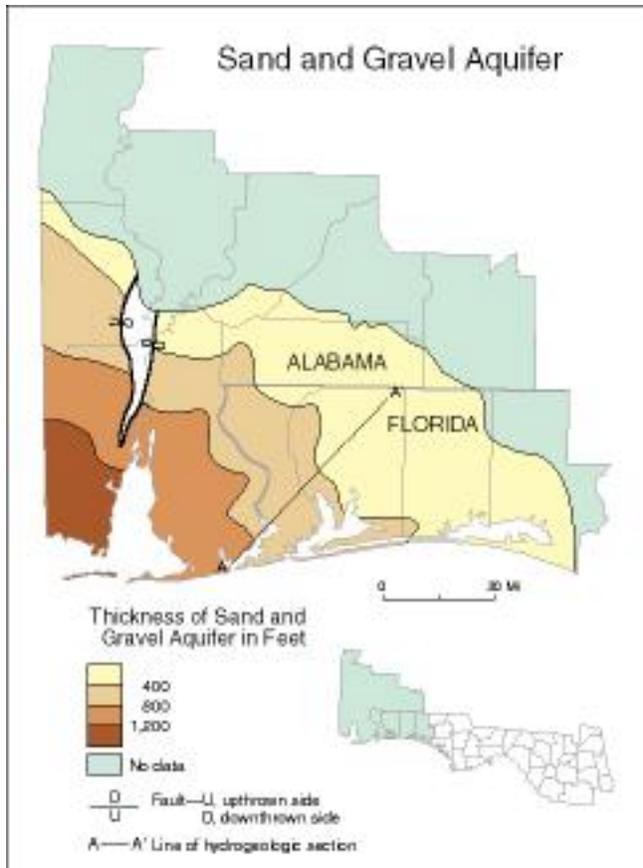


## **SAND AND GRAVEL AQUIFER**

The sand and gravel aquifer underlies more than 6,000 square miles of land surface in southwestern Alabama and the western Florida panhandle. It is the major source of groundwater in Escambia and Santa Rosa counties and is a secondary source in Okaloosa and Walton counties. As its name implies, it consists largely of interbedded layers of quartz-rich sand and gravel. Clay beds and lenses are common throughout the aquifer and form local confining beds. The aquifer is wedge-shaped. It is thinnest at its northern and eastern limit and thickest (1,400 feet) in southwestern Alabama. The sand and gravel aquifer has been subdivided into three different hydrologic zones: the upper water-table zone, the intermediate zone, and the lower main producing zone. The upper zone consists mostly of unconsolidated sand of the Citronelle Formation, the intermediate zone consists of less permeable sand and clay deposits, and the main producing zone consists of Miocene age coarse sand and gravel beds. The main producing zone is recharged by downward leakage from the upper zone. The intermediate confining unit underlies the main producing zone inhibiting downward movement of groundwater. Wells in the main producing zone commonly yield more than 1,000 gallons per minute, and the transmissivity is as high as 20,000 feet squared per day.

Water in the aquifer is unconfined where overlying clay deposits are thin or absent and is under artesian conditions where clay deposits are thick and confine water movement. Water enters the sand and gravel aquifer as recharge from precipitation and moves generally downward and downgradient, either discharging to streams or moving toward the coast. The regional flow pattern is affected substantially by pumping. In some locations where heavy pumping from several well fields has occurred, water levels were reported to have dropped 20 to 25 feet from 1940 to 1973 (Trapp 1975).

As is typical of other unconfined surficial aquifers, the sand and gravel aquifer is easily contaminated.



### References

Trapp, H. 1975. Preliminary report November 1973, Hydrology of the Sand-and-Gravel Aquifer in Central and Southern Escambia County, Florida. U.S. Geological Survey Open-File Report FL-74027. Tallahassee, Florida.

### Study Questions

1. What is an artesian well?
2. What is a confined aquifer?
3. What is the relationship between an artesian well and a confined aquifer?
4. Why is an unconfined surficial aquifer easily contaminated?