INTRODUCTION

The intermediate aquifer occurs between the surficial (water table) aquifer and the Floridan aquifer. The aquifer includes all water-bearing units and confining material below the confining layer at the base of the surficial aquifer and above the top of the Floridan aquifer. Regionally, the intermediate aquifer varies from one water-bearing unit in the northern part of the study area to three water-bearing units in the southwestern part. The intermediate aquifer occurs in Charlotte, De Soto, Sarasota, Hardee, Manatee, and parts of Hillsborough, Pinellas, Highlands, and Polk Counties (figs. 1 and 2). The intermediate aquifer is widely used as a source of water, although yields of individual wells and total withdrawal of water from the aquifer are generally much less than from wells open to the deeper Floridan aquifer. The intermediate aquifer is an important source of water in Manatee, Sarasota, and Charlotte Counties because in these areas the Floridan aquifer, which is the principal source of ground water in adjacent areas, contains water of high mineral content.

The objectives of this investigation are to show on maps (1) the configuration of the top and (2) the thickness of the intermediate aquifer. The maps were prepared in cooperation with the Southwest Florida Water Management District.

Data from an investigation by Wolansky (1983) of the hydrogeology of Charlotte, Sarasota, and parts of De Soto Counties were used to construct maps of the study area. Additional data from lithological and geophysical logs from the files of the U.S. Geological Survey and from previous reports of the Florida Bureau of Geology and the U.S. Geological Survey were also used.

INTERMEDIATE AQUIFER

The water-bearing units of the intermediate aquifer consist of discontinuous sand, gravel, shell, and limestone and dolomite beds in the Tamiami Formation of late Miocene age and the Hawthorn Formation of middle Miocene age. Within parts of Polk, Manatee, Hardee, De Soto, Sarasota, and Charlotte Counties, sand and clay beds within the Tampa Limestone that are hydraulically connected to the Hawthorn Formation are also included in the intermediate aquifer (Wilson, 1977, p. 102).

The intermediate aquifer includes confining beds that consist of sandy clay, clay, and marl. These confining beds generally retard vertical movement of ground water within the intermediate aquifer and between the overlying surficial aquifer and the underlying Floridan aquifer.

The intermediate aquifer in west-central Florida begins in the central part of Pinellas, northeastern Hillsborough, and northern Polk Counties and extends southward into the southern part of the study area. In this report, the top of the intermediate aquifer is the top of the uppermost water-yielding limestone, dolomite, or semiconsolidated sand, gravel, and shell that are vertically persistent. In most areas, the top of the Hawthorn Formation is the top of the intermediate aquifer; however, in Charlotte and Sarasota Counties and in southwestern De Soto County, the uppermost limestone, marl, or shell beds in the Tamiami Formation are the top of the intermediate aquifer. The top of the intermediate aquifer is about 100 feet above sea level in Polk County and slopes to about 100 feet below sea level in Charlotte County (fig. 2).

The thickness of the intermediate aquifer increases toward the south and ranges from less than 100 to more than 600 feet (fig. 1). The thickness includes the confining bed at the base, but does not include the confining bed between the surficial aquifer and the first permeable zone of the intermediate aquifer. The base generally coincides with the top of the Floridan aquifer as mapped by Wolansky (1983) in Sarasota and parts of De Soto Counties and in the rest of the study area as mapped by Buono and Rutledge (1979). Thus, the thickness includes all strata between the top of the first permeable zone below the surficial aquifer and the top of the Floridan aquifer (fig. 3).

The intermediate aquifer mapped in this report is equivalent to the upper confining bed of the Floridan aquifer as used by Hickey (1981) in Pinellas County; to the secondary artesian aquifer in Polk County (Stewart, 1966), in Manatee County (Peek, 1958), and in Hillsborough County (Peek, 1959); to the upper unit of the Floridan aquifer as used by Wilson (1977) in De Soto and Hardee Counties; to aquifers in the upper part of the Hawthorn Formation as used by Bishop (1956) in Highlands County; to zones 2 and 3 as used by Joyner and Sutcliffe (1976) in parts of Sarasota and Charlotte Counties; to the upper and lower aquifers as used by Sproul and others (1972) in part of Lee County; and three zones (1, 2, and 3) as used by Sutcliffe and Thompson (1983). Within Sarasota, Charlotte, and the southwestern part of De Soto Counties, where clayey materials separate the upper part of the Hawthorn Formation from the lower part, the intermediate aquifer is subdivided into the Tamiami-upper Hawthorn aquifer and the lower Hawthorn-upper Tampa aquifer by Wolansky (1983). In the rest of the study area, the upper and lower parts of the Hawthorn Formation are hydraulically connected.

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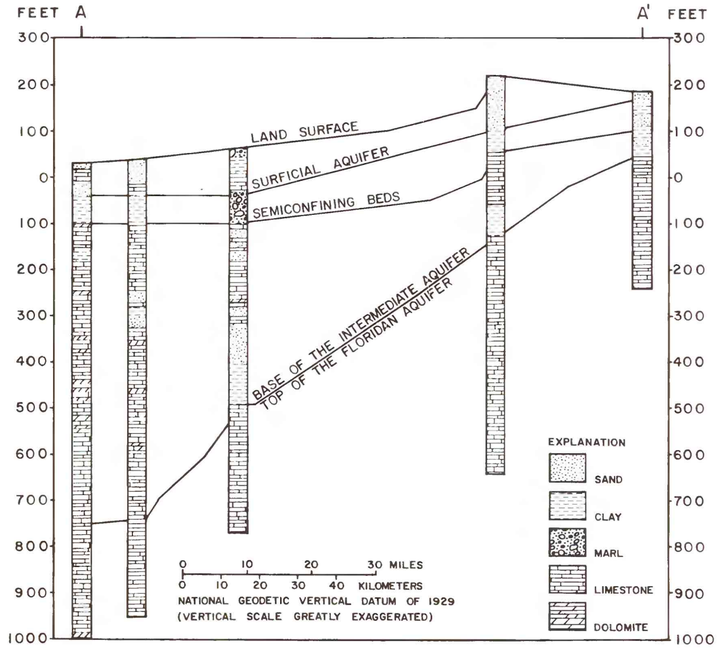
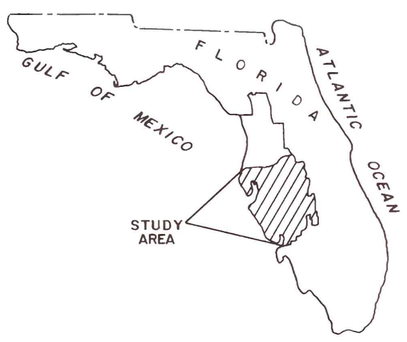


Figure 3.—Geological section A-A' through the study area. (Location of section is shown in figs. 1 and 2.)



ABBREVIATIONS AND CONVERSION FACTORS

Factors for converting inch-pound units to International System of Units (SI) and abbreviation of units

Multiply	*By*	*To obtain*
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level. NGVD of 1929 is referred to as sea level in the text of this report.

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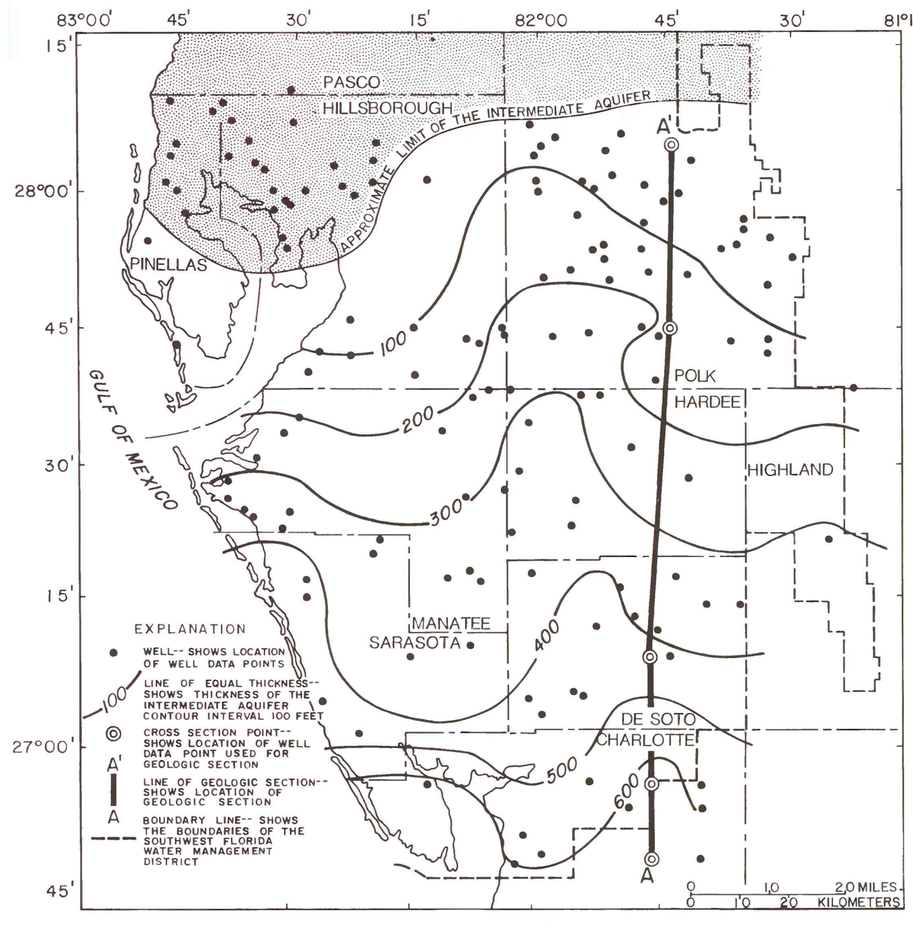

Figure 1.—Thickness of the intermediate aquifer.

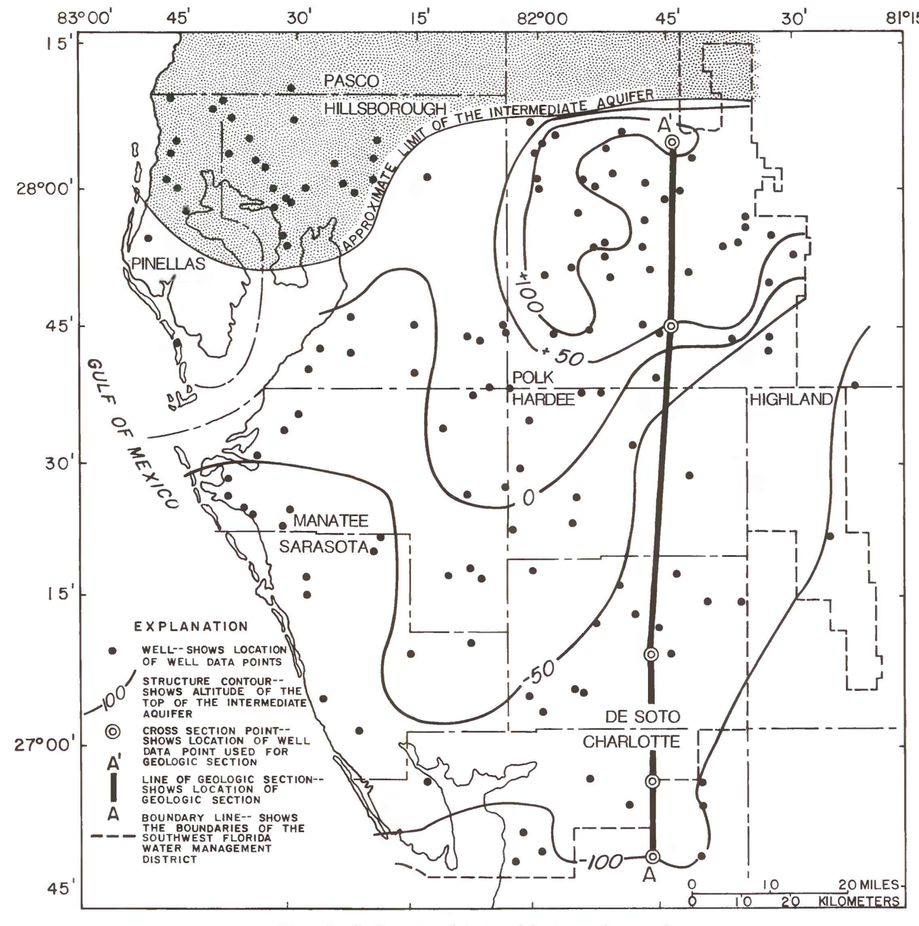

Figure 2.—Configuration of the top of the intermediate aquifer.

GENERALIZED THICKNESS AND CONFIGURATION OF THE TOP OF THE INTERMEDIATE AQUIFER, WEST-CENTRAL FLORIDA

By
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1984