DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

WATER-RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 80-433

INTRODUCTION

This map shows the approximate configuration of the top of the highly permeable dolomite zone of the Floridan aquifer in the Southwest Florida Water Management District. The top of the highly permeable zone generally corresponds to the top of a thick bed of massive, hard, dark-brown dolomite occurring in the Avon Park Limestone of middle Eocene age. The top of the zone varies from about 100 feet below the National Geodetic Vertical Datum of 1929 (NGVD of 1929) in the northern part of the District to more than 1,000 feet below the datum in the southern part.

The hard, dark-brown dolomite bed commonly contains large solution channels that have developed from fractures. Hydrologic testing indicates that the bed is highly permeable in most areas. In most of southwest Florida, the bed is locally referred to as the "lost brown zone," or "water-bearing zone." Generally, a well that penetrates 100 feet or more into the zone will yield large quantities of water.

Detailed hydrologic tests in the Tampa Bay area has shown that a permeable dolomite zone as much as 300 feet thick occurs above the dark-brown dolomite (J. J. Hickey, oral commun., 1979). This dolomitized zone is mapped as part of the the highly permeable zone in the Tampa Bay area only (see map). General experience has been that a highly permeable zone commonly occurs tens of feet below the surface of the dark-brown dolomite, but it is recognized that (1) the hard, dark-brown dolomite may not be a single persistent dolomite unit, and (2) a dolomitized section containing a highly permeable zone may occur above this surface.

This map was prepared from geologists', geophysical, and drillers' logs. Logs include those in the files of the Florida Bureau of Geology, U.S. Geological Survey, Southwest Florida Water Management District, and those in published reports.

SELECTED REFERENCES

Bishop, E. W., 1966, Geology and ground-water resources of Highlands County, Florida: Florida Geological Survey Report of Investigation 15, 118 p.

Chen, C. S., 1965, The regional lithostratigraphic analysis of Paleocene and Eocene rocks of Florida: Florida Geological Survey Bulletin 45, 105 p.

Duncan and Moore, 1975, Consumptive-use application supporting report, Hardee County Phosphate project, Hardee County, Florida: Consultants' report to C F Industries, Inc., in files of Southwest Florida Water Management District, v 1 and 2.

Faulkner, G. L., 1973, Geohydrology of the Cross-Florida Barge Canal area with special reference to the Ocala National Forest: U.S. Geological Survey Water-Resources Investigations 1-73, 117 p.

Fountain, R. C., and Associates, 1975, An analysis of hydrologic conditions of surface and ground water system in the area of the Baker Property, Hernando and Manatee County, Florida: Consultants' report to Prince Phosphate Corp. in files of Southwest Florida Water Management District, 64 p.

Geraghty and Miller, Inc., 1976, Hydrologic effects of developing 15 MGD of water from the Floridan aquifer in the Pine Level area, Desoto and Manatee Counties, Florida: Consultants' report to Phillips Petroleum Company in files of Southwest Florida Water Management District, 72 p.

Guyton, W. F., and Associates, 1978, Swift Agricultural Chemicals Corp., Manatee Mine Site, four volumes: Well inventory, irrigation wellfogging, and well construction, 10 p.; Test hole geophysics and borehole flow, 20 p.; Consultants' report in files of Southwest Florida Water Management District.

Hickey, J. J., 1977, Hydrogeologic data for the McKay Creek subsurface waste-injection site, Pinellas County Florida: U.S. Geological Survey Open-File Report 77-802, 117 p.

_____ 1978, Hydrogeologic data for the South Cross Bayou subsurface waste-injection test site, Pinellas County, Florida: U.S. Geological Survey Open-File Report 79-802, 104 p.

Klein, Howard, Schroeder, M. C., and Lichtler, W. F., 1964, Geology and ground-water resources of Glades and Hendry Counties, Florida: Florida Geological Survey Report of Investigation 37, 101 p.

LaMoreaux, P. E., and Associates, 1975a, Water resources evaluation for Prince Phosphate Corporation's Hookers Prairie tract, Polk County, Florida: Consultants' report in files of Southwest Florida Water Management District.

_____ 1975b, Four Corners Mine, Hillsborough and Manatee Counties, Florida, application for development approval: Consultants' report in files of Southwest Florida Water Management District.

_____ 1976, Borden Big Polar Mine, development of regional impact application: Consultants' report in files of Southwest Florida Water Management District.

_____ 1978, Water resources evaluation, Mississippi Chemical Corporation proposed phosphate mine, Hardee County, Florida: Consultants' report in files of Southwest Florida Water Management District, 655 p.

Parker, G. G., Ferguson, G. E., and Love, S. K., 1955, Water resources of southeastern Florida, with special reference to the geology and ground water of the Miami area: U.S. Geological Survey Water-Supply Paper 1255, 965 p.

Pride, R. W., Meyer, F. W., and Cherry, R. N., 1966, Hydrology of the Green Swamp area of Florida: Florida Geological Survey Report of Investigation 43, 137 p.

Stewart, H. G., 1966, Ground-water resources of Polk County, Florida: Florida Geological Survey Report of Investigation 44, 170 p.

Stringfield, V. T., 1966, Artesian water in Tertiary limestone in the southeastern states: U.S. Geological Survey Professional Paper 517.

Vernon, R. O., 1951, Geology of Citrus and Levy Counties, Florida: Florida Geological Survey Bulletin 33, 256 p.

_____ 1970, The beneficial uses of zones of high transmissivities in the Floridan aquifer for water storage and waste disposal: Florida Bureau of Geology Information Circular 70, 39 p.

Water and Air Research, Inc., 1975, Pump test evaluation of the Floridan aquifer at Port Leonrose, Hillsborough County, Florida: Consultants' report to Brewster Phosphates, Inc., in files of Southwest Florida Water Management District, 39 p.

Wesselhoft, W. D., 1964, Geohydrologic reconnaissance of Pasco and southern Hernando Counties, Florida: Florida Geological Survey Report of Investigation 34, 39 p.

_____ 1965, Reconnaissance of springs and sinks in west-central Florida: Florida Geological Survey Report of Investigation 39, 42 p.

Wilson, W. E., 1977, Ground-water resources of DeSoto and Hardee Counties, Florida: Florida Bureau of Geology Report of Investigation 82, 101 p.

EXPLANATION

WELL—Shows location of well with log information available

STRUCTURE CONTOUR—Shows the altitude of the top of the highly permeable dolomite zone of the Floridan aquifer. Interval 100 feet. National Geodetic Vertical Datum of 1929

BOUNDARY LINE—Indicates the boundary of the Southwest Florida Water Management District

CONFIGURATION OF THE TOP OF THE HIGHLY PERMEABLE DOLOMITE ZONE OF THE FLORIDAN AQUIFER, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

R. M. WOLANSKY, G. L. BARR, AND R. M. SPECHLER

1980

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1977—G3055