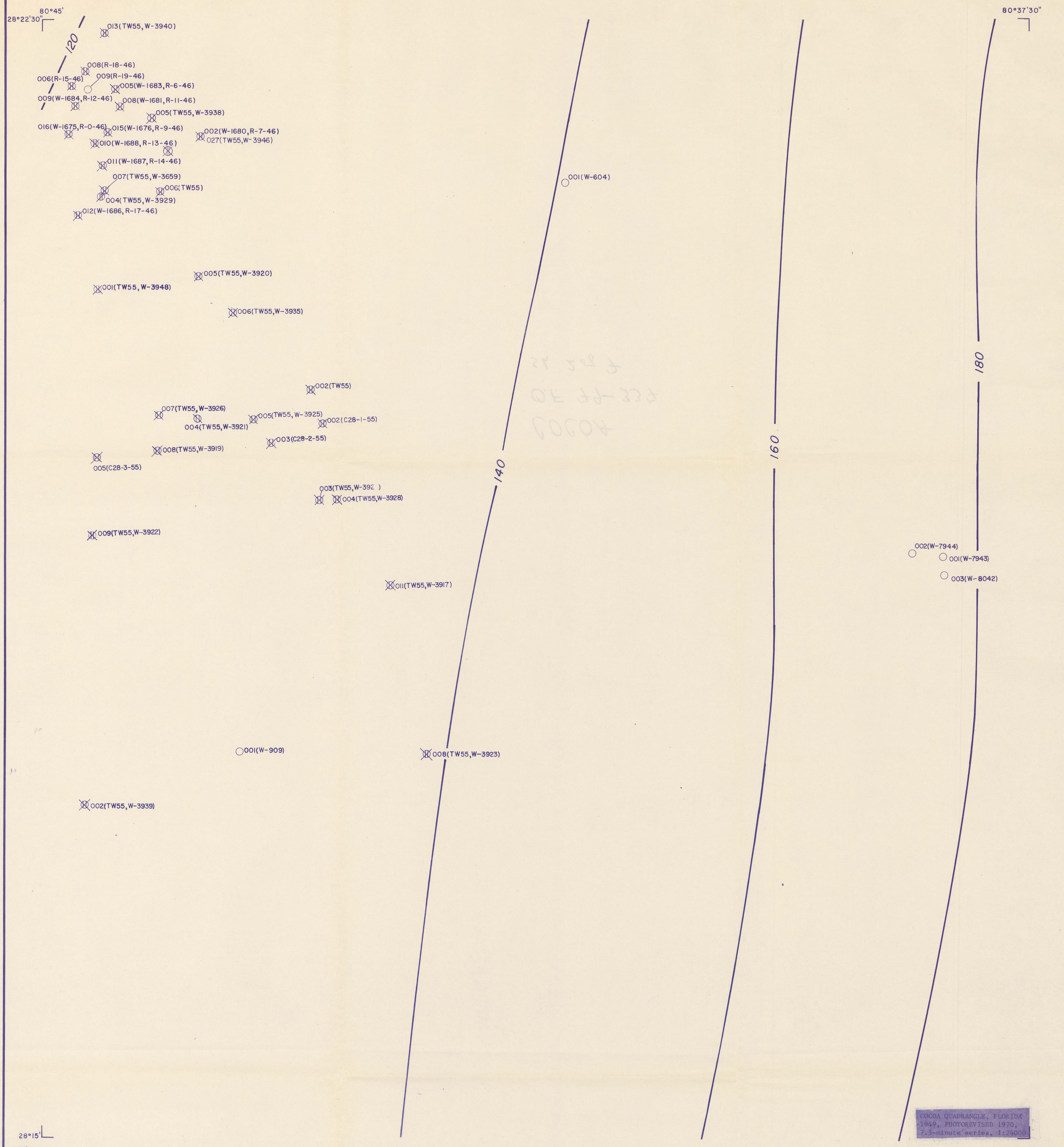
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in cooperation with the
BREVARD COUNTY BOARD OF COUNTY COMMISSIONERS

OPEN-FILE REPORT
79-337
SHEET 2 of 7



COCOA QUADRANGLE, FLORIDA
1949, PHOTOREVISED 1970,
7.5-minute series, 1:24000

EXPLANATION

—— 140 —— Altitude of top of Floridan aquifer, in feet below mean sea level. Contour interval 20 feet.

○ 002 (TW-55) U.S. Geological Survey test well. Number is last three digits of local well number (sheet 1). Letter-number combination in parentheses is field or agency identifier; final two digits denote year drilled.

○ 002 (W-3939) Well with Florida Geological Survey well log. Letter-number combination in parentheses is agency file identifier.

○ 001 (R-14-46) Consultant test hole. Letter-number combination in parentheses is field or agency identifier; final two digits denote year drilled.

○ 002 (C28-1-55) Corps of Engineers test hole. Letter-number combination in parentheses is field or agency identifier; final two digits denote year drilled.

◍ Test hole

⊠ Destroyed

Note: The overlay shows altitude of top of Floridan aquifer and is based on the shallowest known occurrence of limestones of Eocene age. The contours were originally defined in 1953 (Neill, 1955), and refined in 1955-57 (Brown and others, 1962a) and 1974-76 (references, sheets 2 and 3).

GEOHYDROLOGY

The Cocoa quadrangle area consists of citrus groves and pine-palmetto flatwoods on the generally higher areas, with some sand pine and scrub oak communities along the higher sand ridges; scrub lowlands with many marsh areas; and urban and suburban areas with varying infiltration characteristics. Surface drainage is through the swamps and constructed drainage outlets which ultimately drain the higher sand ridges to the St. Johns, Indian or Banana Rivers.

Ground water occurs under nonartesian and artesian conditions. Nonartesian conditions occur where the upper surface of the zone of saturation (water table) is free to rise and fall in direct response to local rainfall (recharge) and to discharge. Artesian conditions occur where the water in an aquifer is confined by a bed of less permeable material and will rise in a tightly cased well above the base of the confining bed. The level to which the water will rise defines the altitude of the aquifer's potentiometric surface at that location. If the potentiometric surface is above land surface, the well will flow (sheet 3). Water-level measurements in many artesian wells are used to define the configuration of the potentiometric surface over broad areas (sheet 3).

Unconsolidated sediments of Holocene, Pleistocene, and late Miocene age constitute the nonartesian (shallow) aquifer. These sediments lie above the consolidated limestone formations of Eocene age known as the Floridan aquifer. The altitude of the top of the Floridan aquifer is shown on sheet 2. The middle Miocene deposits (Hawthorn Formation) overlie and tend to confine the Floridan aquifer. Where the confining beds are discontinuous and limestones of Miocene age are present, there is usually a hydraulic connection between the middle Miocene and the Eocene deposits.

The Atlantic Coastal ridge, above 30 feet altitude (sheet 1) delineates that part of the shallow aquifer that, in general, has better potential for recharge and that contains water with lower chloride concentrations (sheet 6). Soils with good to excellent permeability, conductive to recharge, lie on the top and flanks of the ridge (sheet 7). However, the Floridan aquifer contains water with chloride concentrations in excess of 600 mg/L throughout the quadrangle (sheet 4) and most of the quadrangle area is a discharge area (sheet 3). These factors combine to largely restrict occurrence of higher quality water in the shallow aquifer to limited areas in the northwest corner of the quadrangle (sheet 6).

All public supplies and other large uses of potable water are imported from the city of Cocoa well field, which is in eastern Orange County. However, there are significant withdrawals of borderline to brackish quality water from both aquifers for use in lawn irrigation and domestic cooling systems. These withdrawals apparently account for the depression in potentiometric change contours in the east-central part of the quadrangle (sheet 3).

SELECTED REFERENCES

This report is 1 of 29 similar map reports prepared on the 7½-minute topographic quadrangle base to cover all of Brevard County (see index, sheet 1). A complete list of references used in preparation of the 29 reports is given below. Individual abbreviated references are noted on the various sheets, as applicable; the user may refer to the following list to obtain the formal reference.

Anderson, K. E., ed., 1973, Water well handbook: Missouri Water Well and Pump Contractors Association., 80 p.

Bostwick, Inc., 1950, Analysis and recommendations for the improvement of the water supply, City of Titusville, Florida: Bostwick, Inc., Daytona Beach, Florida, 52 p.

Brown, D. W., Kenner., W. E. and Brown, Eugene, 1957, Interim report on the water resources of Brevard County, Florida: Florida Geological Survey Information Circular 11, 111 p.

Brown, D. W., Kenner, W. E., Crooks, J. W., and Foster, J. B., 1962a, Water resources of Brevard County, Florida: Florida Geological Survey Report of Investigation 28, 104 p.

_____ 1962b, Water resources records for Brevard County, Florida: Florida Geological Survey Information Circular 32, 180 p.

Crain, L. J., Hughes, G. H., and Snell., L. J., 1975, Water resources of Indian River County, Florida: Florida Bureau of Geology Report of Investigation 80, 75 p.

Florida Department of Natural Resources, 1970, Florida water and related land resources, St. Johns River basin: Florida Department of Natural Resources, 205 p.

Healy, H. G., 1971, Water levels in artesian and nonartesian aquifers of Florida, 1967-68: Florida Bureau of Geology Information Circular 68, 61 p.

Knochenmus, D. D., and Beard, M. E., 1971, Evaluation of the quantity and quality of the water resources of Volusia County, Florida: Florida Bureau of Geology Report of Investigation 57, 59 p.

(Selected References continued to sheet 3.)

OVERLAY MAP OF THE COCOA QUADRANGLE, FLORIDA; ALTITUDE OF TOP OF FLORIDAN AQUIFER AND LOCATIONS OF WELLS FOR WHICH GEOLOGIC DATA ARE AVAILABLE

By
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