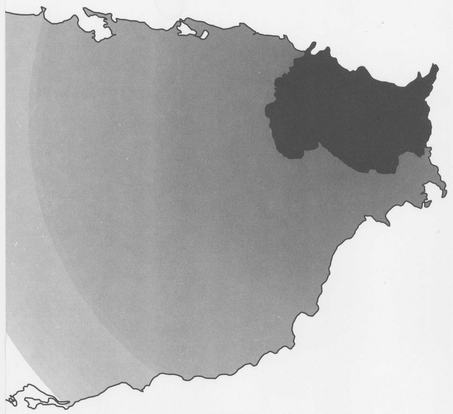

Potentiometric Surface of the Principal Alluvial Aquifers in the Río Espíritu Santo to Río Demajagua Area, Puerto Rico, March 23–24, 1994

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PUERTO RICO AQUEDUCT AND SEWER AUTHORITY

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A survey of ground-water levels in the principal alluvial aquifers in the Rio Espiritu Santo to Rio Demajagua area in northeastern Puerto Rico was conducted during March 23–24, 1994. The survey was carried out as part of a cooperative agreement between the Puerto Rico Aqueduct and Sewer Authority and the U.S. Geological Survey (USGS) to assess the ground-water resources in northeastern Puerto Rico. The geologic formations that occur in northeastern Puerto Rico consist of volcaniclastic and intrusive rock that crop out between discontinuous alluvial deposits in valleys drained by perennial streams or their tributaries (Seiders, 1971; Pease and Briggs, 1972; Briggs and Aguilar-Cortés, 1980). The alluvial deposits are known to be as much as 30 meters (m) thick and consist mostly of fine grained sediments.

The potentiometric surface shown on this map was based on water-level measurements obtained at 41 observation wells constructed by the USGS as part of the ground-water resources study. These observation wells are located throughout the alluvial valleys drained by the main streams in the region. Several observation wells were constructed after the survey to define more accurately the head distribution in the valleys of the Rio Mameyes, the Rio Sabana, the Rio Pitahaya, the Rio Fajardo and the Quebrada Fajardo. Ground-water levels at these wells incorporated into this map are identified by the water-level measurement date. The water levels presented in the map are referenced to mean sea level datum.

Streamflow discharge measurements also were made at 37 sites during March 23-24, 1994, to determine the gaining and losing reaches of streams in the study area. Gaining reaches of streams generally correspond to that part of the stream along which potentiometric contour lines are concave shaped upstream (apex of contour pointing upstream). Losing reaches of streams generally correspond to that part of the stream along which potentiometric contour lines are concave shaped downstream. The direction of ground-water flow in the valleys is indicated on this map by flow lines perpendicular to the approximated potentiometric surface contours. The direction of ground-water flow is generally toward the streams where the potentiometric contours are normal to the stream channel, toward streams where these contours are concave shaped inland and away from the main course of streams where these contours are concave shaped toward the coast. No significant ground-water withdrawals for industrial or public water supply exist in the study area, although some domestic self-supplied minor ground-water withdrawals may be occurring.

References:

Briggs, R.P. and Aguilar-Cortés, E., 1980, Geologic map of the Fajardo and Cayo Icacos quadrangles, Puerto Rico: U.S. Geological Survey Miscellaneous Investigations Series Map I–1153.

Pease, M.H. and Briggs, R.P., 1972, Geologic map of the Rio Grande quadrangle, Puerto Rico: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–733.

Seiders, V.M., 1971, Geologic map of the El Yunque quadrangle, Puerto Rico: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–658.

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EXPLANATION

- ALLUVIAL DEPOSITS
- 5 — PONTENTIOMETRIC CONTOUR—Shows altitude at which water level would have stood in tightly cased well. Dashed where approximately located. Contour intervals variable at 1,2,3,4,5, and 10 meters. Datum is mean sea level
- GROUND-WATER FLOW DIRECTION
- GROUND-WATER DIVIDE—Location is approximate
- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- ⌀ RS-2 — OBSERVATION WELL
- 8.3 (7/28/94) — GROUND-WATER LEVEL AND MEASUREMENT DATE—Dates are for complementary data points as discussed in text. Level is in meters
- △ 0.22 — STREAMFLOW INSTANTANEOUS DISCHARGE MEASUREMENT SITE—Number indicates discharge rate in cubic meters per second