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W. Kelly Summers

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*New Mexico Bureau of Geology & Mineral Resources*  
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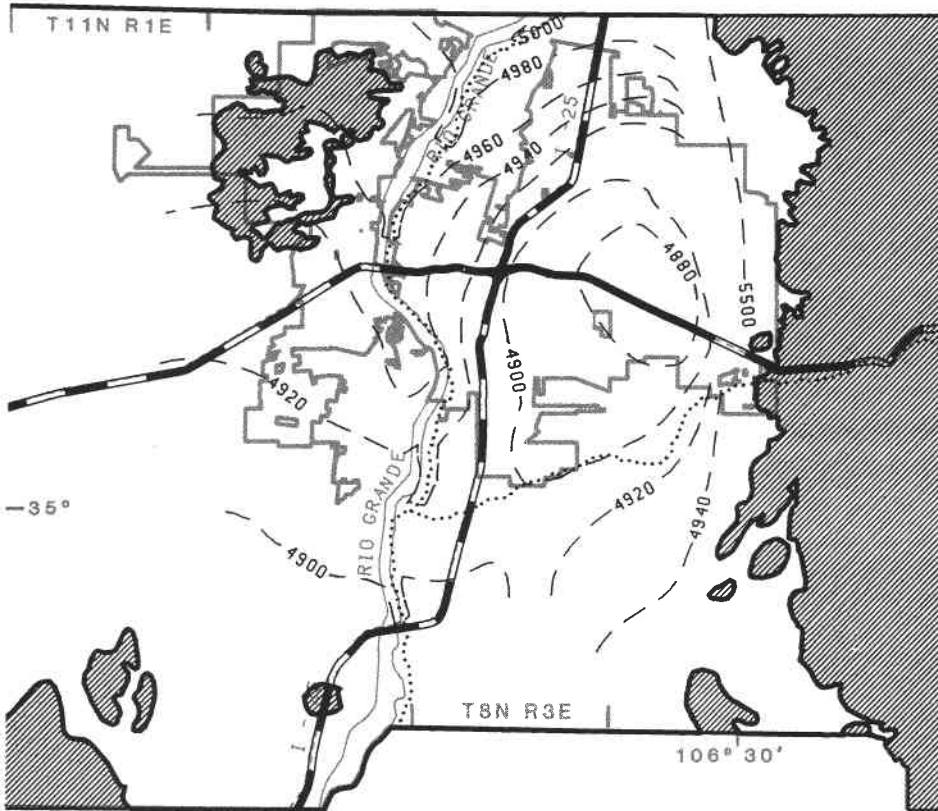
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# Albuquerque's water table—Winter 1988-89

by W. K. Summers, Ground-water Scientist, Water Utility Division, Public Works Department, City of Albuquerque, New Mexico



## EXPLANATION

- APPROXIMATE WATER-TABLE ALTITUDE
- INTERSTATE HIGHWAY
- ..... MAJOR DRAINAGE
- UNCONSOLIDATED DEPOSITS
- CONSOLIDATED ROCKS

Control for the contours of Albuquerque's water table during the winter of 1988-89 came from four sources:

- 1) altitudes of water levels in more than 100 wells installed to monitor ground-water chemistry at the water table;
- 2) altitudes of water levels in the shallowest piezometer in 13 piezometer suites;
- 3) altitudes of the water table picked from the acoustic velocity logs of five test holes drilled for the City of Albuquerque and used to define the 4880' contour; and
- 4) altitudes of water levels in the Rio Grande and the riverside drains taken from topographic maps.

Piezometer data and water movement observed on TV surveys of deep wells indicate downward vertical hydraulic gradients as large as 0.1 ft/ft. So the water levels in deep wells or in wells with more than 40 ft of screen do not define the water table. The altitudes of water levels from these wells supplemented, but did not substitute for, unmistakable water-table altitudes. Where I had to use data from these wells, I drew the water-table contours to show the water-table altitude at or above the water-level altitude in the wells.

## Discussion

On the east side of the Rio Grande the water-table contours close around the city's center of heaviest pumping. The closed contours of the Winter 1988-89 water table lie as much as 130 ft below Kelly's (1982) depiction of the 1936 water table.

The shape of contours along the Rio Grande suggests that through Bernalillo County the river loses water to (re-charges) the ground-water reservoir. For more than two-thirds the length of the river in the county, the water table slopes from the river toward the city's well fields in the eastern half of the city.

The spacing of contours along the mountain front suggests the water table there has an ultra-steep slope.

Pumpage from city wells west of the river probably accounts for the shape of the 4940' contour there. The paucity of substantive water-table data west of the Rio Grande prevented extension of the contours westward more than a mile or two. Over much of this area the depth to the water table exceeds 500 ft and may be as much as 1,000 ft.

The process of bringing together the data from the multiplicity of sources made me realize once again the need both for a

comprehensive ground-water database for the Albuquerque Basin and vicinity and also for water-level-monitoring piezometer suites throughout the basin.

**ACKNOWLEDGMENTS**—This map is an end product of the work of many people and agencies. Data sources included the New Mexico Environmental Improvement Division (now the Environment Department), the U.S. Environmental Protection Agency, the City of Albuquerque Environmental Health Department, the Water Utility Division of the Albuquerque Public Works Department, Sandia Corporation, Kirtland Air Force Base, Public Service Corporation of New Mexico, and my friends among the consulting community. Linda Logan, L & R Enterprises, checked well locations, my arithmetic, and contour placement. CH2M Hill Central Inc., digitized the contours and plotted them on the bedrock base map. D. Earp, J. Shomaker, W. Stone, and M. Wasiolek reviewed the manuscript. My thanks, many times, to each of you.

## Reference

- Kelly, T. E., 1982, History of water use in the greater Albuquerque area: New Mexico Geological Society, Guidebook to 33rd Field Conference, pp. 351-356. □