U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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COLORADO SPRINGS UTILITIES,
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Radell, M.J., Lewis, M.E., and Watts, K.R., 1995, Hydrogeologic characteristics of the alluvial aquifer and adjacent deposits of the Fountain Creek Valley, El Paso County, Colorado

WATER TABLE

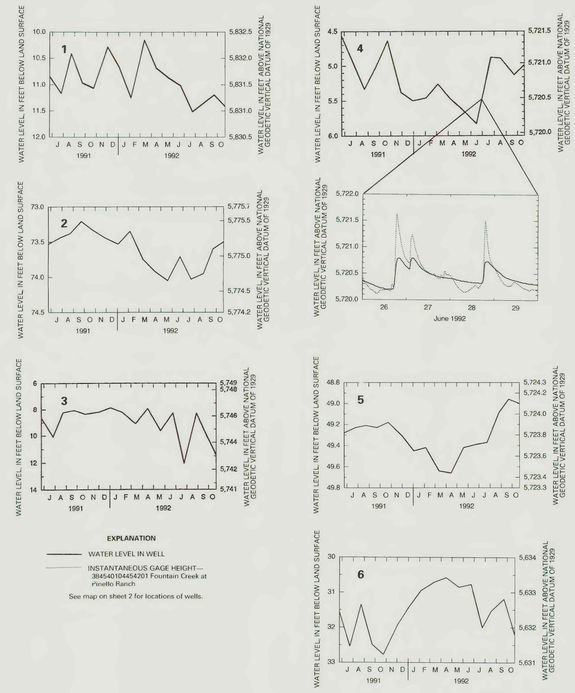
Water levels were measured monthly between June 1991 and September 1992 at 48 U.S. Geological Survey observation wells, 2 abandoned irrigation wells, and 28 observation wells established by a local manufacturing company near Little Johnson Reservoir. The data from October 1991 were used to map the water-table surface (sheet 2). Where data were lacking for that period, primarily in the Windmill Gulch and upper Sand Creek areas, historic water-level data were used to construct the map. Water-table altitudes along the northwest-southeast axis of the valley ranged from about 5,893 feet at the northwestern boundary of the study area to about 5,625 feet at the southeastern boundary. The highest measured water-table altitude, 5,923 feet, was on the eastern boundary.

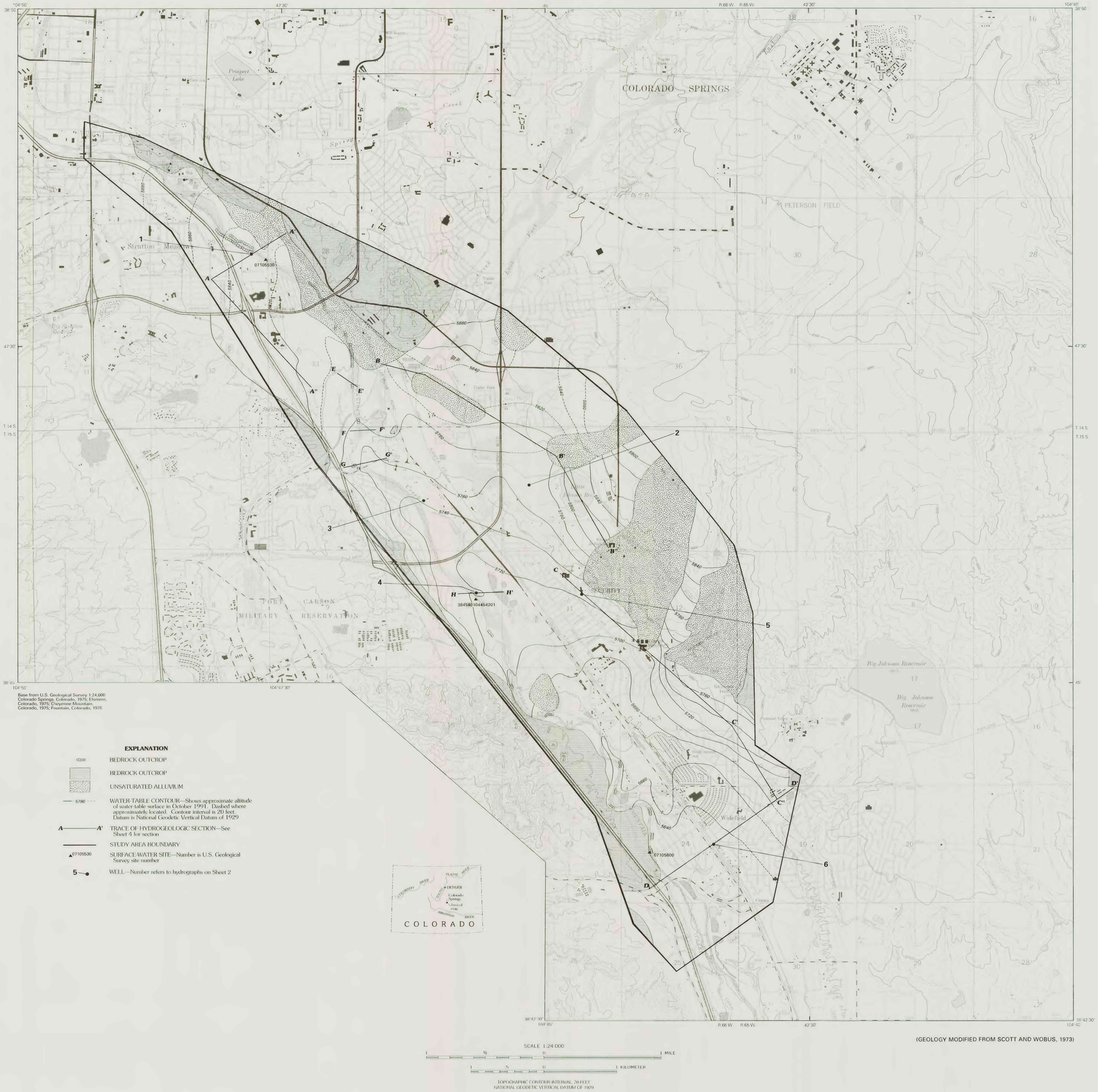
Water is present in the alluvial deposits along Fountain Creek, in the buried channel east of Fountain Creek, and in adjacent alluvial and eolian deposits east of the main axis of the aquifer. The alluvial deposits in the Fountain Creek Valley tend to vary in composition with distance from current (1991-92) and ancestral channels. The deposits predominately are sand and gravel containing varied amounts of silt and clay. The alluvium tends to be coarser, contain more gravel, and be highly permeable near Fountain Creek; in the buried channel of the aquifer; in ancestral channels of Sand Creek; and in Windmill Gulch. Away from these areas, the alluvium tends to contain less gravel and more clay, and, thus, is less permeable.

Ground-water flow generally is in a southeasterly direction, but southwesterly movement occurs along the eastern boundary. During this study, ground-water flow was toward Fountain Creek along most of its course in the study area (sheet 2 and hydrogeologic sections E-E', F-F', and H-H', sheet 4). An exception was T.15.S, R.66.W, section 10 where water flows from the creek into the aquifer. However, the water then flows back into the creek within a short distance downstream. Fountain Creek is assumed to be in hydraulic connection with the aquifer along most of its length in the study area except where the creek is incised into bedrock (sheets 1-3) or where the bedrock ridge is adjacent to the creek (hydrogeologic section G-G', sheet 4). The direction of flow in areas where the alluvium is connected to Fountain Creek is controlled by hydraulic-head differences that can vary in response to amount of flow in Fountain Creek, pumping in the aquifer, and such climatic factors as drought or greater than normal precipitation.

Bedrock ridges and buried alluvial channels tend to direct the flow of water on a local scale (sheet 1 and hydrogeologic sections, sheet 4). Part of the flow in the upper Sand Creek area is diverted to the southeast because of a shale ridge that trends southeast in T.14.S, R.66.W, section 34 and continues to the south in T.15.S, R.66.W, section 3. There are bedrock ridges to the northwest and southeast of Little Johnson Reservoir (T.15.S, R.66.W, section 2). Ground-water flow in this area is to the southwest until reaching the main part of the aquifer where flow is almost directly south. Bedrock crops out along most of the western boundary of the aquifer and little inflow is contributed from this direction.

Water levels, which were measured monthly in most of the wells, generally fluctuated less than 2 feet during the study (hydrographs 1, 2, 4, and 5, sheet 2). Large fluctuations in water level occurred in some wells located adjacent to Fountain Creek and in wells near large-capacity municipal-supply wells (hydrographs 3 and 6, sheet 2). In wells located very close to Fountain Creek, continuous water-level records for the wells and for Fountain Creek show the response of the water levels in the aquifer to changes in the water level of the creek (hydrograph 4, sheet 2).





Base from U.S. Geological Survey 1:24,000 Colorado Springs, Colorado, 1975; Elsmere, Colorado, 1975; Cheyenne Mountain, Colorado, 1975; Fountain, Colorado, 1976

(GEOLOGY MODIFIED FROM SCOTT AND WOBUS, 1973)

Sheet 2.—Altitude and configuration of the water table of the alluvial aquifer in the Fountain Creek Valley, El Paso County, Colorado, October, 1991

HYDROGEOLOGIC CHARACTERISTICS OF THE ALLUVIAL AQUIFER AND ADJACENT DEPOSITS OF THE FOUNTAIN CREEK VALLEY, EL PASO COUNTY, COLORADO

By
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