



EXPLANATION

Bedrock outcrop

Approximate alignment of principal valleys to bedrock surface—Line pattern indicates paleovalley

Bedrock-surface contour—Shows approximate altitude of bedrock surface. Contour interval 20 feet. Hash marks indicate depression features. Datum is sea level

A—A' Line of geologic section

Altitude and Configuration of the Bedrock Surface

The map of the altitude of the bedrock surface (fig. 4) was computed by the geographic information system as the difference between the maps of the altitude of the land surface and the thickness of the unconsolidated sediments. Land-surface altitude was defined by digital coverage (digital representation of a map), which were smoothed to produce a generalized land-surface coverage that has a resolution commensurate with the thickness coverage. The geographic information system was used to subtract the thickness coverage (fig. 3) from the smoothed land-surface coverage and to plot the resulting map of the altitude of the bedrock surface (fig. 4). Figure 4 is a smoothed surface and does not show small-scale features present in the bedrock surface. Thus, in areas where the unconsolidated sediments are thin, the altitude of a smoothed bedrock contour might be slightly above or below the altitude of a corresponding unsmoothed land-surface contour shown on the base map. These small discrepancies are beyond the intended resolution of figure 4.

In areas of thin unconsolidated sediments, the altitude and configuration of the bedrock surface are similar to that of the land surface; however, in areas of thick sediments, the bedrock surface bears little resemblance to the land surface. The geologic section (fig. 5) shows the altitude and configuration of the land surface and bedrock surface along a line extending from a point about 4 miles north of Firestone to near King Lake (fig. 4). The bedrock and land surfaces are similar in areas of thin sediments, but in areas near the South Platte valley, Beebe Draw, and Box Elder Creek, the unconsolidated sediments are thicker and the land surface does not conform to the bedrock surface.

Beebe Draw coincides with the South Platte River paleovalley, which is the largest paleovalley in the demonstration area. This paleovalley is about 35 miles long and extends from a point about 7 miles south of Brighton (south of the study area) to the confluence with the South Platte Valley near Lower Latham Reservoir. This paleovalley may have been the course of the ancestral South Platte River (Scott, 1982; Robson, 1996) before the river changed course and cut its present valley about 10 miles to the west. The present valley of Box Elder Creek intersects the South Platte River paleovalley about 5 miles north of Hudson. This indicates that Box Elder Creek may have been tributary to the ancestral South Platte River in this location.

Other large valleys in the bedrock surface are associated with and likely formed by the South Platte River, Big and Little Thompson Rivers (in the northwest part of the area), Saint Vrain Creek, Big and Little Dry Creeks (in the southwest part of the area), and Box Elder Creek.

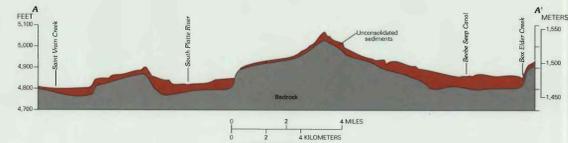
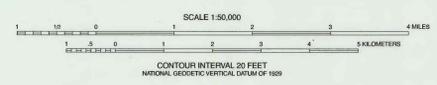


FIGURE 5—Geologic section.

FIGURE 4—Altitude and configuration of the bedrock surface.

Base from U.S. Geological Survey
1:50,000 Adams and Wald Counties



GEOHYDROLOGY OF THE SHALLOW AQUIFERS IN THE FORT LUPTON-GILCREST AREA, COLORADO

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