

**EXPLANATION**

Line showing thickness of loosely packed sediments  
Thickness interval 100 and 200 feet (30.5 and 61 meters)

Line showing depth to bedrock, or thickness of combined loosely and tightly packed sediments  
Thickness and depth interval 1,000 feet (305 meters)

Water well used for control

Feet	Meters
0	0
100	30.5
200	61
400	122
600	183
800	244
1000	305

Color key for thickness of loosely packed sediments  
Uncolored parts of the map represent areas of outcropping bedrock

The map may be useful as a general guide in planning, but investigation by qualified specialists should be made for detailed evaluations of specific areas.

References to other reports of possible interest to the reader are included at the end of this text.

**WHAT THE MAP SHOWS**

The map provides information about the distribution and thickness of geologic material in three different categories of firmness, and, indirectly, it shows the shape of an ancient land surface.

The upper unit, designated as loosely packed sediments, consists of loosely to moderately well packed material ranging in size from boulders to clay. The designation "loosely packed" is mostly based on drillers' descriptions of material found in water wells. The designation is used in a relative, rather than exact, sense. The sediments have not been compacted enough to force the grains tightly together, so there is much open space between the grains. At places this space may be filled with water, which generally is able to move rather freely toward a lower level. The movement of water may be hindered, however, by layers of clay or by a few thin cemented zones that are present locally in the loosely packed sediments. The map unit shown as loosely packed sediments is of Pleistocene and Holocene age.

Tightly packed sediments are present between the base of the loosely packed sediments and the top of the underlying bedrock at most places in the western part of the quadrangle. The approximate thickness of the tightly packed sediments can be determined by subtracting the thickness of the loosely packed sediments from the depth to bedrock. The tightly packed sediments consist of boulders to clay-size grains that are moderately well to tightly packed. They differ from the overlying loosely packed sediments in that the grains have been packed closer together, probably owing to the weight of overlying material, to the action of ground water, and to shaking by ancient earthquakes. Cemented zones also are present in these sediments. These deposits are denser, harder, and firmer than the overlying loosely packed sediments. The tightly packed sediments are of Tertiary age.

The bedrock beneath the sediments consists in part of limestone, dolomite, shale, sandstone, or quartzite, similar to the rocks exposed in the Wasatch Range in the eastern part of the quadrangle, which are of pre-Tertiary age. The bedrock may also include some volcanic lava flows, limestone, siltstone, and conglomerate of older Tertiary age in the western part of the quadrangle. These rocks are cemented, but they are not as hard

**INTRODUCTION**

This map provides information on the location and distribution of three general types of geologic materials in part of Salt Lake County, including the southeastern part of Salt Lake City, Utah. These materials have different physical properties that are pertinent to comprehensive planning and zoning, land-use studies, and engineering usage. The map should be of use in preliminary studies to determine the depth to different general types of foundation material and to determine the potential for settlement of the ground surface during major earthquakes, which could result in damage to waterlines, gaslines, large buildings, and other major engineering structures.

The lines on the map are generalized. Lines showing the thickness of loosely packed sediments are based on drillers' logs of 27 water wells in and near the 35-square-mile part of the quadrangle west of the mountains—less than one data point for each square mile. Lines showing the depth to bedrock are based on indirect geophysical data, and the data points are more widely scattered.

**GEOLOGIC MATERIALS ARE IMPORTANT TO PEOPLE**

The thickness map may be useful for various studies that pertain to earthquake damage, stability, settlement, foundation evaluations, and ground-water resources. Planning and zoning commissions, real-estate developers, teachers, and other people interested in this area may find the map useful, because knowledge of the geologic materials on which we build homes and buildings is essential to good engineering practice.

Loose materials tend to settle under heavy loads, from intense vibrations, or from the removal of water. The design of some of the highway overpass structures in the Salt Lake City area provided for as much as 3 feet (1 meter) of settlement of the underlying loosely packed sediments caused by the heavy weight of the structure. Settlement of loosely packed material may result from vibrations caused by large earthquakes. Excessive pumping of underground water can also lead to settlement. As water is withdrawn and water levels are lowered, the sediments tend to consolidate, and settlement may reach the surface. If the amount of settlement is not the same under all parts of masonry structures, such as buildings, roads, and utility lines, these structures may crack or break.

Foundation conditions available in the loosely packed sediments are suitable for most buildings. Exceptionally heavy structures, however, may be more economically founded on the underlying firmer material if it is not too deep; the map provides an indication of the depth to firmer foundation material underlying the loosely packed sediments.

**HOW TO READ THIS MAP**

Three sets of lines on the map show (1) the shape of the ground surface (brown lines), (2) the thickness of the loosely packed sediments (thin black lines), and (3) the depth to bedrock (heavy black lines), which is also the thickness of the combined loosely and tightly packed sediments. To obtain thickness of the tightly packed sediments beneath a given place on the map, subtract the thickness of the loosely packed sediments from the depth to bedrock at that location. The tightly packed sediments are everywhere buried beneath the loosely packed sediments.

Lines showing the thickness of the loosely packed sediments are drawn at intervals of 100 and 200 feet (30.5 and 61 meters). The zero-thickness line is at the contact between exposed bedrock and the loosely packed sediments. The color key in the explanation shows the thicknesses in increments of 100 and 200 feet.

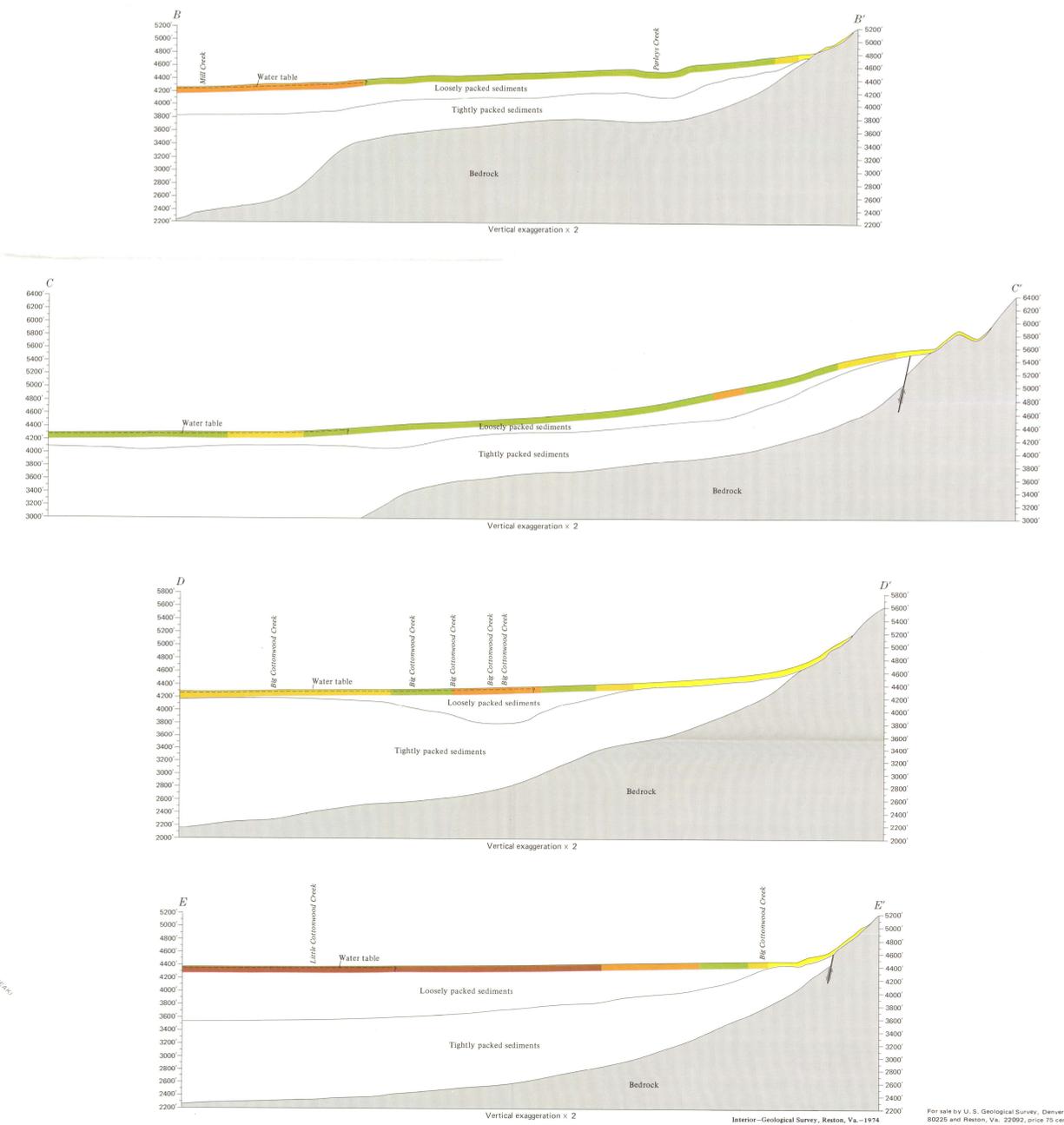
**REFERENCES**

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MAP SHOWING THE THICKNESS OF LOOSELY PACKED SEDIMENTS AND THE DEPTH TO BEDROCK IN THE SUGAR HOUSE QUADRANGLE, SALT LAKE COUNTY, UTAH

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1974