

INDEX MAP SHOWING LOCATION OF STUDY AREA

INTRODUCTION

The study area, located north of the South Platte River in parts of Larimer, Logan, Sedgwick, and Weld Counties, Colo., is an area of about 1,800 square miles in northeastern Colorado (map showing location of study area) underlain by Quaternary deposits or by the Ogallala Formation, the Arikaree Formation, or the White River Formation (or Group) of Tertiary age. The Quaternary deposits are unconsolidated gravel, sand, silt, and clay. The Ogallala Formation is an unconsolidated or partly consolidated deposit of sand, gravel, clay, silt, and caliche. The Arikaree Formation is a loose to moderately cemented sandstone. The White River Formation is mostly consolidated beds of clay and silt with some beds of sandstone and conglomerate.

In the study area, the Quaternary deposits and the Ogallala, Arikaree, and White River Formations are the major sources of water for domestic, industrial, irrigation, and municipal uses. The geology, hydrology, and chemical quality of ground water in the study area were briefly described by Weist (1965), but a water-table map was not included in the report. The purpose of this study was to define the altitude and configuration of the water table for use by water planners and users in future development of the water resources.

SOURCES OF DATA

The map showing the altitude and configuration of the water table was compiled using measured or reported water-level data from the wells shown, the altitude and shape of the land surface, and the altitude of water in perennial streams. Many of the water-level measurements used to compile the map were collected in cooperation with the Colorado Department of Natural Resources, Division of Water Resources, Office of the State Engineer, and the Colorado Water Conservation Board. The map shows a generalized water table because water-level measurements were taken from 1948 to 1978. There has been little ground-water pumpage, however, so the water table should be in equilibrium; therefore, historical water levels should be representative of present water levels. In areas where there are a number of irrigation wells, such as near Grover and Hereford, 1978 water-level measurements were used in preparing the map.

GENERALIZED ALTITUDE AND CONFIGURATION OF THE WATER TABLE

The altitude of the water table ranges from a high of about 7,000 feet in the westernmost part of the study area in Larimer County to a low of about 3,450 feet in the northeast part of Sedgwick County. Ground water moves approximately at right angles to the water-table contours from higher to lower altitudes and is moving south or southeast in most of the study area. In areas where contours are spaced far apart (low hydraulic gradient), the geologic units have greater transmissivity than in areas where contours are close together. The closed 5,300-foot contour northeast of Grover indicates an area of recharge. Along much of the boundary of the study area, water is moving from the White River Formation and overlying Quaternary sediments to adjacent bedrock units and Quaternary sediments overlying these bedrock units.

SELECTED REFERENCES

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1957b, Ground-water resources of parts of Weld, Logan, and Morgan Counties, Colorado, with a section on The chemical quality of the ground water, by F. H. Rainwater: U.S. Geological Survey Hydrologic Investigations Atlas HA-9.

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Christ, M. A., 1980, Effect of pumpage on ground-water levels as modeled in Larimer County, Wyoming: U.S. Geological Survey Water-Resources Investigations Open-File Report 80-1104, 26 p.

Tweto, Ogden, 1979, Geologic map of Colorado: U.S. Geological Survey, scale 1:500,000.

Weist, W. G., Jr., 1964, Hydrogeologic data from parts of Larimer, Logan, Morgan, Sedgwick, and Weld Counties, Colorado: Colorado Water Conservation Board Basic-Data Report 16, 30 p.

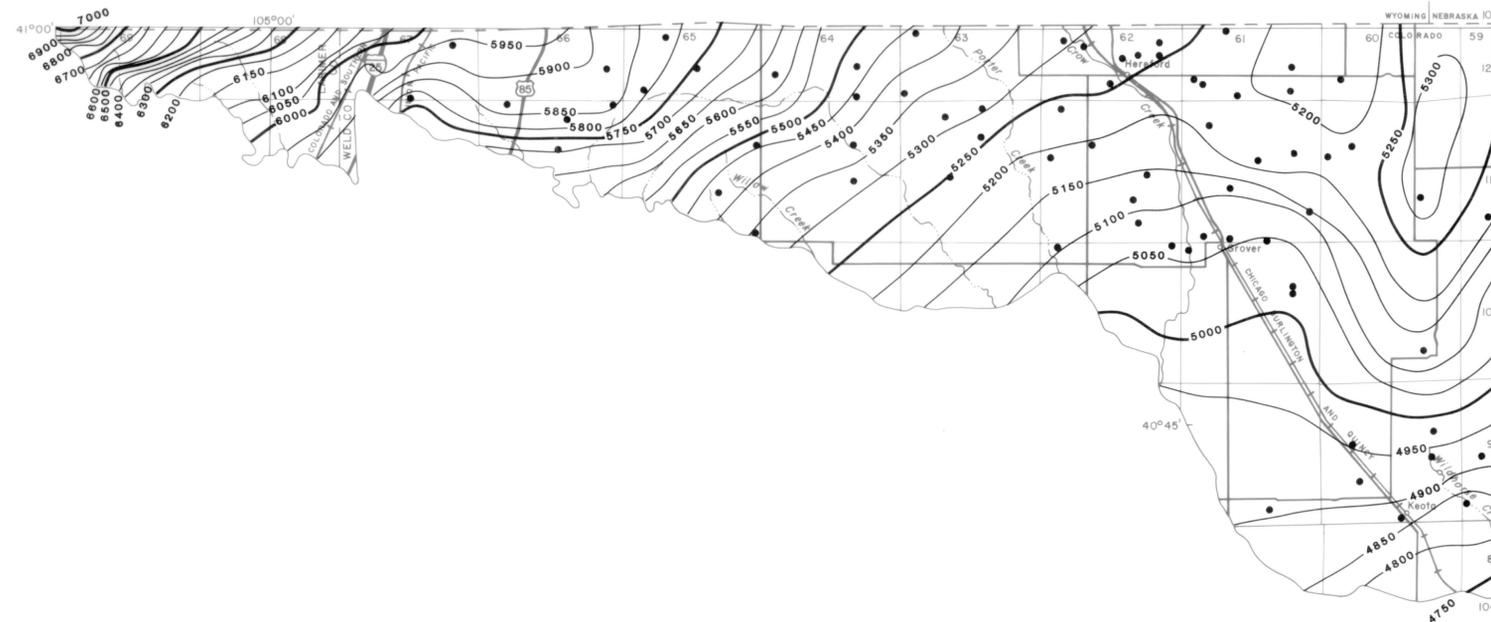
1965, Reconnaissance of the ground-water resources in parts of Larimer, Logan, Morgan, Sedgwick, and Weld Counties, Colorado, with a section on The chemical quality of the water, by Robert Brennan: U.S. Geological Survey Water-Supply Paper 1809-L, p. L1-L24.

CONVERSION FACTORS

Inch-pound units used in this report may be converted to SI (International System) units by use of the following conversion factors:

Multiply inch-pound unit	By	To obtain SI unit
foot	0.3048	meter
square mile	2.590	square kilometer
mile	1.609	kilometer

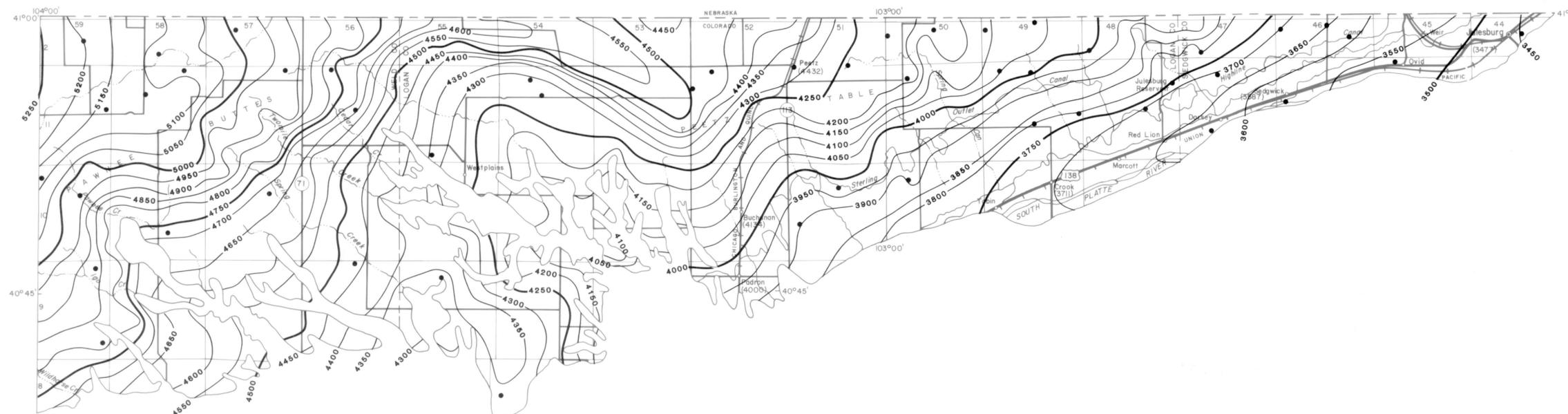
National Geodetic Vertical Datum of 1929: A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level.



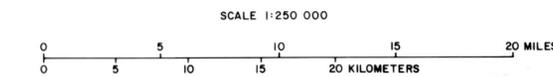
EXPLANATION

— 5250 — WATER-TABLE CONTOUR—Shows approximate altitude of water table. Contour interval 50 feet. National Geodetic Vertical Datum of 1929

• WELL—Has measured or reported water level



Base from U.S. Geological Survey State base map, 1969



MAP SHOWING GENERALIZED ALTITUDE AND CONFIGURATION OF THE WATER TABLE

GENERALIZED ALTITUDE AND CONFIGURATION OF THE WATER TABLE IN PARTS OF LARIMER, LOGAN, SEDGWICK, AND WELD COUNTIES, COLORADO

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