Projected water-level declines in the Ogallala aquifer in Lea County, New Mexico

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HYDROLOGY

Surface Water

Six perennial lakes are near the northern boundary of the modeled area (fig. 1). Lane Salt Lake is in T. 10 S., R. 33 E.; Four Lakes is a group of four small lakes in T. 11 S., R. 34 E.; and Ranger Lake is in T. 11 S., R. 36 E. All six lakes receive inflow from ground water and surface runoff (Ash, 1963).

Numerous shallow, closed depressions scattered over the area collect runoff during periods of heavy rain. Most of the water in these depressions infiltrates or is lost by evaporation within a few months, although a few depressions may contain water throughout the year.

In the western part of the area, where the depressions are most common, surface runoff drains to these depressions. To the east, however, depressions become less common and the predominant surface drainage is southeastward along shallow swales. There are no perennial streams in the area.

Ground-Water System

The Ogallala aquifer is unconfined in Lea County. The water table slopes about 12 feet per mile to the southeast. Depth to water ranges from less than 20 feet in the area of Four Lakes east of Caprock and near Monument, to more than 250 feet along Mescalero Ridge in T. 15 S., R. 31 E. Saturated thickness is minimal in the northern and western part of the area and increases to more than 200 feet in parts of the east-central section. Variation in saturated thickness occurs locally due to irregularities in the underlying bedrock surface.

Recharge to the aquifer occurs from precipitation falling on the High Plains surface. Most of the precipitation is lost by evapotranspiration, but a small amount percolates to the water table.

Discharge from the Ogallala aquifer in Lea County occurs through pumpage and subsurface flow. The general direction of ground-water flow in the aquifer is southeastward. The largest amount of natural ground-water discharge is the subsurface flow moving into Texas. A small amount of the ground water discharges through the Quaternary alluvium to the southern part of Lea County (Nicholson and Clebsch, 1961, p. 59).

Some of the ground water discharges through springs and seeps. Springs have been reported along Mescalero Ridge and near Monument (Ash, 1963; Nicholson and Clebsch, 1961; Theis, 1939). Springs also discharge into the perennial lakes at the north edge of the study area (Ash, 1963).

Relatively little ground water is lost by evapotranspiration. Some ground water discharged to the six perennial lakes is lost to evaporation. Native vegetation near the lakes and near springs and seeps where the water table is near the surface contribute to transpiration losses.