

EXPLANATION

Alluvium and Terrace Deposits and Their Recharge Areas
 (Quaternary in age). Unconsolidated deposits of sand, silt, clay and gravel that occur along or adjacent to modern and ancient streams. Thickness generally ranges from 10 to 50 ft (locally as much as 100 ft). Water generally yields up to 500 gpm; water (yield) is good to fair quality. Most water is of good quality (less than 1,000 mg/L dissolved solids). Recharge areas are essentially the same as distribution of the alluvium and terrace deposits.

Bedrock Aquifers and Their Recharge Areas (Cenozoic through Tertiary in age). Rock units and sediments that are generally favorable or moderately favorable for development of ground-water resources. Thickness of aquifers generally ranges from 100 ft to several thousand feet. Depths to true water table range from a few feet to more than 1,000 ft. Yield of wells 100-400 ft deep, when drilled into these aquifers generally yield 25-300 gpm, although wells in some aquifers yield up to 600-2,500 gpm. Water in most aquifers is of good to fair quality (300-1,500 mg/L dissolved solids). Patterns on map also include known and potential recharge areas for bedrock aquifers.

This map shows the distribution of the principal aquifers and their recharge areas in Oklahoma. It brings together, in one map, data that previously have been distributed on two maps. The two maps, one showing alluvium and terrace deposits and their recharge areas, and the other showing bedrock aquifers and their recharge areas, were compiled by K. S. Johnson, 1983 (Maps Showing Principal Ground-Water Resources and Recharge Areas in Oklahoma: Oklahoma State Department of Health, 1983). The reader is referred to those maps for more detail on the aquifers and their recharge areas, and for a comprehensive bibliography of the literature. The reader is referred to the two maps for more detail on the aquifers and their recharge areas, and for a comprehensive bibliography of the literature.

The term "aquifer" refers to those rocks and sediments saturated with good-to-fair-quality water and are sufficiently permeable to yield significant volumes of water (yield) of 25 gpm or more. The term "bedrock aquifer" refers to sandstone, sand, limestone, dolomite, gypsum, fractured bedrock, and chert; the general distribution and lithology of these aquifers is given on the small bedrock-aquifer map. The term "alluvium" refers to sediments in stream channels or flood plains, and the term "terrace deposit" refers to older flood-plain or alluvial deposits that have been left behind after a stream shifts position or cuts deeply into underlying rocks. Alluvium and terrace deposits are the youngest rocks and sediments, and therefore they overlie the bedrock aquifers where the two are mapped together.

The term "recharge area" refers to those portions of the land surface where surface waters enter an aquifer. The water may move laterally and eventually migrates downward to the zone of saturation in an aquifer. The recharge areas include both known recharge areas (outcrops of the aquifer, and outcrops of overlying confining strata) and potential recharge areas (outcrops of confining strata that may overlie unknown extensions of an aquifer or contain natural or artificial hydraulic pathways to the aquifer, and a safety zone that extends beyond the known recharge areas). The two maps for alluvium and terrace deposits were compiled by K. S. Johnson for separate delineation of the known recharge areas.

Because the known and potential recharge areas are critical in protecting the State's aquifers, special care must be taken in the utilization of these lands. In particular, care must be taken to prevent the entry of wastes and materials that contain leachable or liquid contaminants that could degrade the quality of water within or flowing across the known and potential recharge areas.

A copy of the "Generalized Map Showing Bedrock Aquifers and Recharge Areas in Oklahoma," 1991, is available from the Oklahoma Department of Health (OSDH), Industry, and the public in identifying sites that may be suitable or unsuitable for the storage or disposal of industrial wastes. In the OSDH's Rules and Regulations for the Control of Industrial Wastes, 1991, effective September 25, 1990 is an exclusionary criterion (section 631) which states:

"No construction permit shall hereafter be granted for an off-site construction of municipal waste treatment, storage or disposal facility proposed to be located in an unconsolidated alluvium or terrace aquifer or terrace deposit aquifer, or over or through bedrock aquifers or their recharge areas. There shall be a presumption that the proposed location does not lie within a prohibited area if the proposed location lies wholly or partially within an area designated as an aquifer or bedrock aquifer or recharge area, as shown on the maps described as "Sheet 1: Unconsolidated Alluvium and Terrace Deposits and Their Recharge Areas" and "Sheet 2: Bedrock Aquifers and Their Recharge Areas" in the Maps Showing Principal Ground Water Resources and Recharge Areas in Oklahoma," compiled by Kenneth S. Johnson, Oklahoma Geological Survey, 1983." This presumption may be rebutted by site-specific hydrologic and geological data and other information submitted by the applicant. The burden of proof is on the applicant and convincingly that the proposed location does not lie in a prohibited area within a prohibited area. The Department will consider the protection plan required by the Oklahoma Geological Survey. [Similar protection plan is required for an on-site facility pursuant to 63 O.S. Section 1-2014(B).] Existing facilities in these areas may continue to operate under existing permits. A copy of the "Generalized Map of Disposal of Industrial Wastes in Oklahoma," Oklahoma Geological Survey Circular 50, 82 p.

The two original ground-water-resources maps, done in 1983, and this map were compiled mainly from a series of hydrologic atlases prepared cooperatively by the Oklahoma Geological Survey and the U.S. Geological Survey (see Hydrologic Atlases listed below). The hydrologic atlases are generally favorable or moderately favorable for development of ground-water resources (yield generally more than 25 gpm) on the basis of the hydrologic atlases. The hydrologic atlases, which are recomputed every 10 years, are available from the Oklahoma Geological Survey. The reader for more detailed information on the distribution and character of the aquifers and their recharge areas, and on the quality and quantity of water that is available from the aquifers.

Mapping in the three Panhandle counties is mainly from hydrologic atlases prepared cooperatively by the U.S. Geological Survey and the Oklahoma Geological Survey (see Hydrologic Atlases listed below), and from work done by the Oklahoma Geological Survey and released as part of the Perryton and Dalhart Sheets of the Geologic Atlas of Texas.

