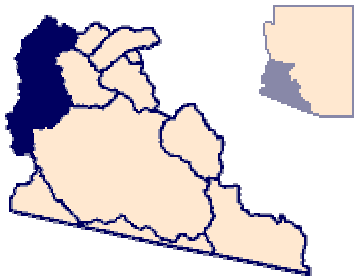
PARKER BASIN



The Parker basin covers approximately 2,145 square miles of western Arizona along the Colorado River (Figure 15). The area is located in the Basin and Range physiographic province which is characterized by sediment-filled valleys, bounded by elongated mountain ranges. The mountain ranges include the Buckskin, Plomosa, New Water, Kofa, Castle Dome, and Chocolate Mountains. Elevations in the basin vary from over 3,600 feet above mean sea level in the New Water Mountains to about 150 feet above mean sea level where the Colorado River exits the basin. The Colorado River provides the only surface water in the basin and is regulated by numerous dams upstream.

Metzger and others (1973) described, in descending order, the alluvial deposits, Bouse Formation and fanglomerate unit as the most important units when evaluating the water resources in the Parker area. The most developed of the units are the alluvial deposits which consist of silt, sand, and gravel deposits. The Bouse Formation generally is composed up of limestone, inner-bedded clay, silt, and sand, and underlies the alluvial deposits. The fanglomerate unit underlies the Bouse Formation and is composed locally of cemented gravel and thin basalt flows.

Along the Colorado River, groundwater occurs under both unconfined (water-table) and confined (artesian) conditions. Groundwater in the alluvial deposits is found under unconfined conditions. Deeper wells, drilled into and through the Bouse Formation and into the fanglomerate unit, contain groundwater under confined conditions.

The younger alluvium consists of the most recent silt, sand, and gravel deposits found along the Colorado River floodplain and its tributary washes. The older alluvium consists of basin-fill remnants of the surrounding mountains. Groundwater in the floodplain alluvial deposits is hydraulically connected to the river and is legally considered surface water. Shallow groundwater in the floodplain generally reflects the chemical characteristics of Colorado River water (Metzger and others, 1973). Use of this water requires contracts with the U.S. Bureau of Reclamation.

The Bouse Formation occurs throughout the basin and can be divided into an upper and lower zone. Groundwater occurs under unconfined (water-table) conditions in the upper zone which consists of medium to coarse-grained sand. The upper zone of the Formation can yield moderate amounts of groundwater. The lower zone contains clay, silt, and fine sand, and groundwater occurs under confined (artesian) conditions. Fine-grained sediments cause the lower zone to act as an aquitard, producing very limited amounts of groundwater. Metzger and others (1973) reported positive artesian head (i.e., water level in the well stands above the local water table) in the Bouse Formation ranging from one to seven feet.

The fanglomerate underlies the Bouse Formation and can yield moderate amounts of groundwater. Groundwater occurs under confined (artesian) conditions with reported artesian heads ranging from 1 to 42 feet (Metzger and others, 1973).

In the eastern part of the basin, groundwater generally is found under unconfined (water-table) conditions and water levels are relatively unchanged from natural conditions (Metzger and others, 1973). Groundwater, although found in small quantities, flows from inner-mountain basins and follows stream courses toward the

Colorado River. Owen - Joyce (1987) estimates that 1,550 acre-feet per year move as groundwater underflow from the eastern part of the basin to the floodplain area. Water quality generally is good, however, some nitrate contamination has been noted in the Quartzite area due to the use of many septic tanks and shallow depths to water (Arizona Department of Environmental Quality, 1990).

Recharge to the Parker basin comes from the Colorado River, precipitation, seepage from canals and irrigated land, and underflow from bordering areas. The Colorado River contributes the largest portion of recharge. The quantity is unknown but varies with the level of the river and with the amount of groundwater withdrawn in the floodplain.

Groundwater is pumped for municipal, domestic, irrigation, and drainage purposes. Along the floodplain, withdrawals are used primarily to control rising water levels. Scattered domestic wells exist across the basin but are concentrated in the Colorado River floodplain and around Quartzite. The depth to water for wells completed in the floodplain ranges from 5 to 25 feet below land surface (Metzger and others, 1973). Wells completed outside the floodplain have depths to water of between 70 and 300 feet below land surface (Metzger and others, 1973). The City of Parker gets most of its water from deep wells tapping the fanglomerate unit; two of these wells had reported well yields of 200 and 900 gallons per minute (Metzger and others, 1973). Parker also has a U.S. Bureau of Reclamation contract for 630 acre-feet per year of Colorado River water.

The availability of surface water, as well as the low population in the basin, have caused groundwater development to be small. An estimated 14 million acre-feet are in storage in the basin to a depth of 1,200 feet below land surface and less than 4,000 acre-feet were withdrawn in 1985 (Arizona Department of Water Resources, 1988).

The high concentration of total dissolved solids render the chemical quality of much of the groundwater in the Parker basin to be relatively poor. The quality of the groundwater is influenced by local geology, as well as the effects of the Colorado River and irrigation developments. Groundwater acceptable for domestic and public supply occurs at various depths throughout the basin (Metzger and others, 1973). Total dissolved solids concentrations of groundwater in Parker basin ranged from 390 to 4,200 milligrams per liter (Metzger and others, 1973). Fluoride concentrations in the basin ranged from 0.3 to 6.0 milligrams per liter with the highest concentrations found in the Bouse Formation (Metzger and others, 1973).