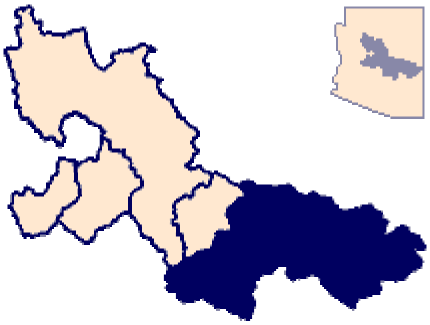
SALT RIVER BASIN



The Salt River basin contains about 5,130 square miles in east-central Arizona (Figure 3). Most of the basin lies within the Central highlands physiographic province. Much of the basin's northern boundary follows the Mogollon Rim, a 2,000 foot escarpment that forms a natural groundwater divide. The basin is bounded on the west and southwest by the Sierra Ancha and Superstition Mountains, on the south by the Nantac Rim, and on the east by the White Mountains.

The U.S. Geological Survey (1986) estimated that 10,000 acre-feet of groundwater was pumped from the basin in 1984. Acidic water with elevated concentrations of metals has contaminated an alluvial aquifer in a mining district in the Globe-Miami area. This body of acidic water is approximately nine miles long and is slowly moving downgradient (Eychaner, 1988).

The Salt River basin is divided into the following four sub-basins: Salt River Lakes, Salt River Canyon, Black River, and White River (Figure 3). These sub-basins are presented separately in the following discussion.

SALT RIVER LAKES SUB-BASIN

The Salt River Lakes sub-basin contains mostly igneous granitic, metamorphic, and sedimentary rocks. Unconsolidated sediments are basin-fill materials that accumulated in the larger valleys in the sub-basin. Groundwater occurs to some extent in all of these rock units.

Unconsolidated sands and gravel occur within the floodplains of streams and washes and are generally the most productive aquifer. Semi-consolidated to consolidated basin-fill sediments known as the Gila Conglomerate occur in the Globe-Miami area where they form a local aquifer in the tectonic graben of Pinal Creek. In this area, the Gila Conglomerate is up to 4,000 feet thick, and provides the bulk of both domestic and industrial water supplies (Rouse, 1981). The City of Globe operates several public-supply wells in the adjacent San Carlos Valley sub-basin of Safford basin. Brown (1989) reported a water level decline of 170 feet between 1974 and 1987 in one well located in Section 9, Township 1 South, Range 16 East. A limestone aquifer also provides public supply and industrial water in the Globe-Miami area. Where fractured and faulted, the limestone aquifer can produce large amounts of good quality water. The igneous granitic rocks provide only minor amounts of water because of their very low primary permeability (Rouse, 1981). Most of this water is derived from fractured, fissured, and faulted or decomposed sequences. Other than the industrial and public supply wells in the Globe-Miami areas, most water production is from low-demand domestic and stock wells. There also are numerous springs and seeps that flow in direct response to precipitation (Feth and others, 1954).

Acidic water that drains from areas disturbed by mining activities has created a contaminant plume in the alluvial aquifer along Pinal Creek and Miami Wash (Eychaner, 1988). This alluvial aquifer exhibits elevated levels of heavy metals such as aluminum, barium, copper, manganese, and iron. High sulfate levels are also present and precede the front of elevated metal concentrations in groundwater (Arizona Department of Environmental Quality, 1990).

SALT RIVER CANYON SUB-BASIN

The western section of the Salt River Canyon sub-basin is composed of sedimentary and igneous granitic rocks similar to those in the Salt River Lakes sub-basin. The rest of the sub-basin consists primarily of consolidated sedimentary rocks. These rocks include flat-lying limestones, sandstones, siltstones, shales, and thin conglomerates. The sedimentary rocks are cut by the Salt River Canyon which is the major drainage feature of the sub-basin.

Because of a lack of well data not much is known about potential aquifers in this area. Springs in the area may produce up to 900 gallons per minute (Feth and others, 1954). Rock units that may produce useable quantities of water in the sub-basin include the Supai Formation, Redwall Limestone, Coconino Sandstone, and the undivided sandstones. These units are producing aquifers in the Plateau uplands province, and potentially could provide useable quantities of water within the sub-basin. Near the Salt River Canyon all upper rock units are dewatered; lower units discharge groundwater to the Salt River thereby supporting base flow of the river.

WHITE RIVER SUB-BASIN

The southwestern part of the White River sub-basin contains the same consolidated sedimentary rocks as the Salt River Canyon sub-basin. However, the eastern part of the sub-basin is covered with volcanics. The volcanics consist of basaltic lava flows, cinder beds, and tuffaceous agglomerates (Mann and Nemecek, 1983).

Groundwater occurs in the various volcanic flows in cinder beds, weathered zones, and fracture zones. Water is produced from seeps, springs, and shallow, low-yield wells. In the Pinetop-Lakeside-Show Low area, similar basalts form part of an aquifer locally known as the Pinetop-Lakeside aquifer where production rates may exceed 300 gallons per minute (Mann, 1976).

BLACK RIVER SUB-BASIN

The Black River sub-basin is almost entirely covered by volcanics. Basalt flows, rhyolitic ash flows, tuffs, and tuffaceous agglomerates form layers in excess of 3,000 feet thick in places (Brown, 1989). Water is available from low-yield wells, springs, and seeps. The few wells completed in these basalts are widely scattered and used for stock and domestic consumption. Well depths of 400 to 800 feet deep are common; cinder beds, fracture zones, and weathered zones provide the best well yields (Brown, 1989). Brown (1989) reported that wells in the Natanes Plateau show no water-level declines, therefore, groundwater on the plateau may be at or near steady-state conditions.