

# **Method to Identify Wells That Yield Water That Will Be Replaced by Colorado River Water in Arizona, California, Nevada, and Utah**

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## **Abstract**

Accounting for the use of Colorado River water is required by the U.S. Supreme Court decree, 1964, *Arizona v. California*. Water pumped from wells on the flood plain and from certain wells on alluvial slopes outside the flood plain is presumed to be river water and is accounted for as Colorado River water. A method was developed to identify wells outside the flood plain of the lower Colorado River that yield water that will be replaced by water from the river. The method provides a uniform criterion of identification for all users pumping water from wells by determining if the elevation of the static water table at a well is above or below the accounting surface. Wells that have a static water-level elevation equal to or below the accounting surface are presumed to yield water that will be replaced by water from the river. Wells that have a static water-level elevation above the accounting surface are presumed to yield water that will be replaced by water from precipitation and inflow from tributary valleys.

The method is based on the concept of a river aquifer and an accounting surface within the river aquifer. The river aquifer consists of permeable, partly saturated sediments and sedimentary rocks that are hydraulically connected to the Colorado River so that water can move between the river and the aquifer in response to withdrawal of water from the aquifer or differences in water-level elevations between the river and the aquifer. The subsurface limit of the river aquifer is the nearly impermeable bedrock of the bottom and sides of the basins that underlie the Colorado River valley and adjacent tributary valleys. The accounting surface represents the elevation and slope of the unconfined static water table in the river aquifer outside the flood plain and the reservoirs of the Colorado River that would exist if the river were the only source of water to the river aquifer. The accounting surface extends outward from the edges of the flood plain or a reservoir to the subsurface boundary of the river aquifer. Maps at a scale of 1:100,000 show the extent and elevation of the accounting surface from the area surrounding Lake Mead to Laguna Dam near Yuma, Arizona.

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