

# **A METHOD FOR ESTIMATING GROUND-WATER RETURN FLOW TO THE COLORADO RIVER IN THE PARKER AREA, ARIZONA AND CALIFORNIA**

*By S. A. Leake*

## **ABSTRACT**

**A method for estimating unmeasured ground-water return flow from water diverted for irrigation is needed to determine consumptive use of water from the lower Colorado River in the Parker area, Arizona and California. For use of the method, a part of Parker Valley is divided into two subareas. Ground water under one of the subareas drains directly to the river as unmeasured ground-water return flow. Ground water under the other subarea drains to drainage ditches and is a part of the measured surface-water return flow at the point of discharge to the river. The subareas were delineated using average annual water-table altitudes in a shallow aquifer that underlies Parker Valley. For the subarea under which ground water drains directly to the river, ground-water return flow is estimated with a water budget. In the water budget, consumptive use is estimated on the basis of a consumptive-use value computed for irrigated land in the subarea under which ground water drains to drainage ditches. Surface-water diversions are estimated on the basis of measured diversions to Parker Valley and irrigation requirements within the valley. Application of the method using data from 1981 resulted in an estimate of 15,400 acre-feet of ground-water return flow that discharges directly to the Colorado River.**

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