

EXPLANATION

STREAMFLOW CONDITIONS IN THE SAN FRANCISCO RIVER—MAY 29 TO JUNE 1, 1978—AND BLUE RIVER—JUNE 13 TO 17, 1978

— REACH IN WHICH STREAMFLOW WAS CONTINUOUS

- - - REACH IN WHICH STREAMFLOW WAS INTERRUPTED

▲ 09444200 STREAMFLOW-GAGING STATION AND NUMBER—Operated by the U.S. Geological Survey

▲ 0.2E 265 MISCELLANEOUS STREAMFLOW-MEASURING AND WATER-SAMPLING SITE—Upper number, 0.2, is streamflow in cubic feet per second (E, estimated). Lower number, 265, is dissolved-solids concentration in milligrams per liter

□ 10 RIVER MILE—Approximate distance in miles upstream from mouth

SURFACE WATER

In May and June 1978 streamflow measurements were made and water samples were collected to estimate the low-flow characteristics of the San Francisco and Blue Rivers. The streamflow measurements cannot be used to determine gains or losses of less than 5 ft³/s in the San Francisco River and less than 2 ft³/s in Blue River because of the fluctuations in flow (fig. 2).

Flow in the San Francisco River ranged from 52 to 60 ft³/s, and the flow-duration curve for the gaging station at Clifton indicates that a discharge of 60 ft³/s is equaled or exceeded 57 percent of the time (fig. 3). Significant increases or decreases in flow did not occur except between the Arizona-New Mexico State line and river mile 43—a loss of 8 ft³/s—and at the confluence of the San Francisco and Blue Rivers—a gain of 7 ft³/s. Other gains and losses were 5 ft³/s or less, and the only tributary inflow was from Dix Creek, Blue River, and a spring near Clifton. As the water flowed downstream in the San Francisco River, the dissolved-solids concentration increased from 263 to 885 mg/L owing to inflow from the springs near Clifton (fig. 4). Water from one spring contained 11,700 mg/L of dissolved solids and was mainly a sodium and chloride type (sheet 1). The spring is in a marshy area on the bank of the San Francisco River, and the flow could not be measured or estimated. Other springs are present, but their openings are hidden by the flow in the river. For example, Clifton Hot Springs, which is in NW 1/4 sec. 30, T. 4 S., R. 30 E., could not be located in 1978, but Feth and Hem (1963, p. 35) reported that the discharge of the springs averaged about 1,000 gal/min and that the springs contributed about 50 tons per day of dissolved solids to the river.

Streamflow measurements made in the Blue River June 13 to 17, 1978, ranged from less than 1 to 5.5 ft³/s, and the flow-duration curve for the gaging station about 17 mi northeast of Clifton indicates that a discharge of 5 ft³/s is equaled or exceeded 86 percent of the time (fig. 3). On May 30, 1978, 7.1 ft³/s was measured near the mouth. In places between Blue and river mile 13, the flow was interrupted and probably is seasonal or occurs only in response to precipitation or snowmelt. During extended dry periods, other reaches of the river also may cease to flow. The chemical quality of the flow in the river varied from place to place. Upstream from river mile 20, the dissolved-solids concentration in water from the Blue River and some of its tributaries ranged from 106 to 432 mg/L. From river mile 20 downstream to its confluence with the San Francisco River, the dissolved-solids concentration ranged from 318 to 375 mg/L.

SELECTED REFERENCES

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Feth, J. H., and Hem, J. D., 1963, Reconnaissance of headwater springs in the Gila River drainage basin, Arizona: U.S. Geological Survey Water-Supply Paper 1619-R, 54 p.

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1977b, National secondary drinking water regulations: Federal Register, v. 42, no. 62, March 31, 1977, p. 17143-17147.

Wilson, E. D., and Moore, R. T., 1958, Geologic map of Graham and Greenlee Counties, Arizona: Arizona Bureau of Mines map, scale 1:375,000.

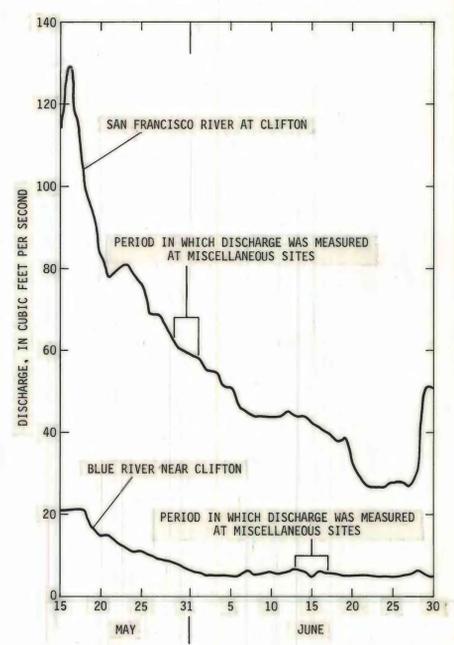
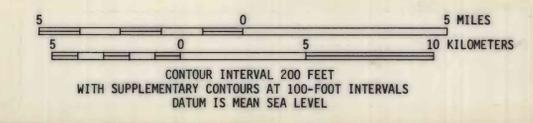


Figure 2.--Discharge at gaging stations on the San Francisco and Blue Rivers, May 15 to June 30, 1978.

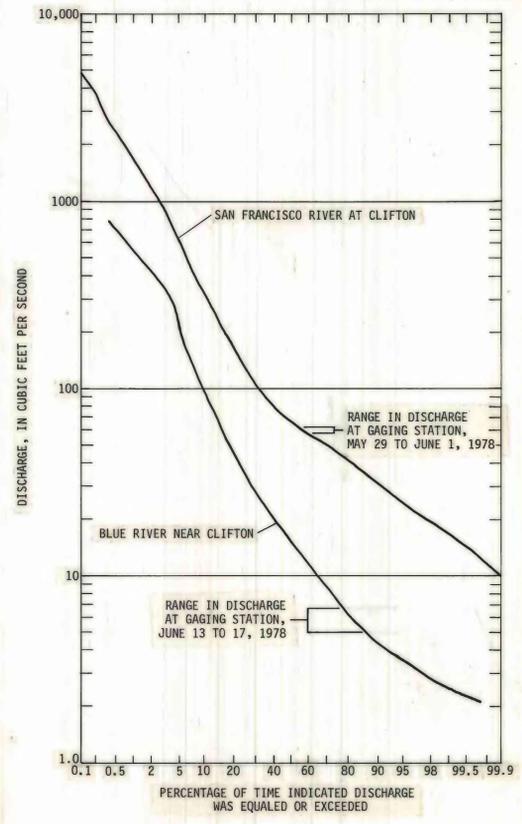


Figure 3.--Flow-duration curves for San Francisco River, 1928-33 and 1936-75, and Blue River, 1969-75.

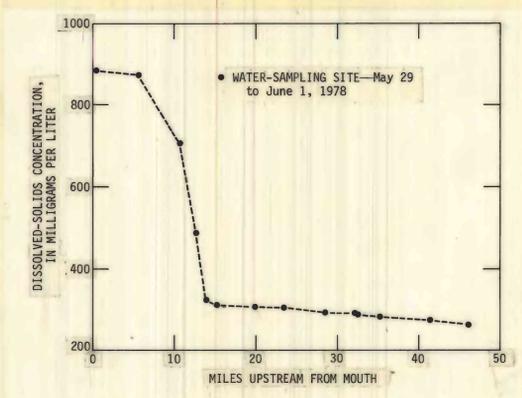


Figure 4.--Increase in dissolved solids as water moves downstream in the San Francisco River.

BASE FROM U.S. GEOLOGICAL SURVEY
CLIFTON 1:250,000, 1954-71 AND
SILVER CITY 1:250,000, 1954-70