UTAH AND GOSHEN VALLEYS

By S.J. Brockner

Northern Utah Valley is the part of Utah Valley that is north of Provo Bay. Ground water occurs in unconsolidated basin-fill deposits in the valley. The principal ground-water recharge area for the basin fill is in the eastern part of the valley, along the base of the Wasatch Range.

Southern Utah Valley is the part of Utah Valley south of Provo and bounded by the Wasatch Range, West Mountain, and the northern extension of Long Ridge. Goshen Valley is south of the latitude of Provo and is bounded by West Mountain, Long Ridge, and the East Tintic Mountains. Ground water occurs in the alluvium in the valleys under both water-table and artesian conditions, but most wells discharge from artesian aquifers.

Total estimated withdrawal of water from wells in Utah and Goshen Valleys in 1998 was about 86,000 acre-feet, which is 10,000 acre-feet less than was reported for 1997, and 24,000 acre-feet less than the average annual withdrawal for 1988-97 (tables 2 and 3). Withdrawal in northern Utah Valley was about 48,900 acre-feet, which is 17,000 acre-feet less than in 1997; withdrawal in southern Utah Valley was about 22,500 acre-feet, which is 2,800 acre-feet more than in 1997; withdrawal in Goshen Valley was about 14,500 acre-feet, which is 4,200 acre-feet more than in 1997. Most of the total decrease in withdrawal probably resulted from decreased withdrawal for public supply and irrigation.

The location of wells in Utah and Goshen Valleys in which the water level was measured during March 1999 is shown in figure 13. The relation of the water level in selected observation wells to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of the Spanish Fork River at Castilla, and to concentration of dissolved solids in water from three wells is shown in figure 14.

Water levels in Goshen Valley and in the northern and southern parts of Utah Valley generally rose in the early 1980s. The rise corresponds to a period of greater-than-average precipitation and recharge from surface water. Water levels generally declined from 1985 to 1993 in Utah Valley and generally have risen since 1993. This rise probably resulted from decreased withdrawal for public supply and irrigation and increased precipitation. Water levels in observation wells in Goshen Valley peaked during 1989-92 and have declined since 1992.

Discharge of the Spanish Fork River at Castilla in 1998 was 245,100 acre-feet, which is 76,800 acre-feet more than the 1933-98 annual average. Precipitation at Silver Lake near Brighton in 1998 was 49.81 inches, which is 6.93 inches more than the 1931-98 annual average and 7.09 inches more than in 1997. Precipitation at Spanish Fork Powerhouse in 1998 was 26.83 inches, which is 7.19 inches more than the 1937-98 annual average and 0.78 inch more than in 1997.

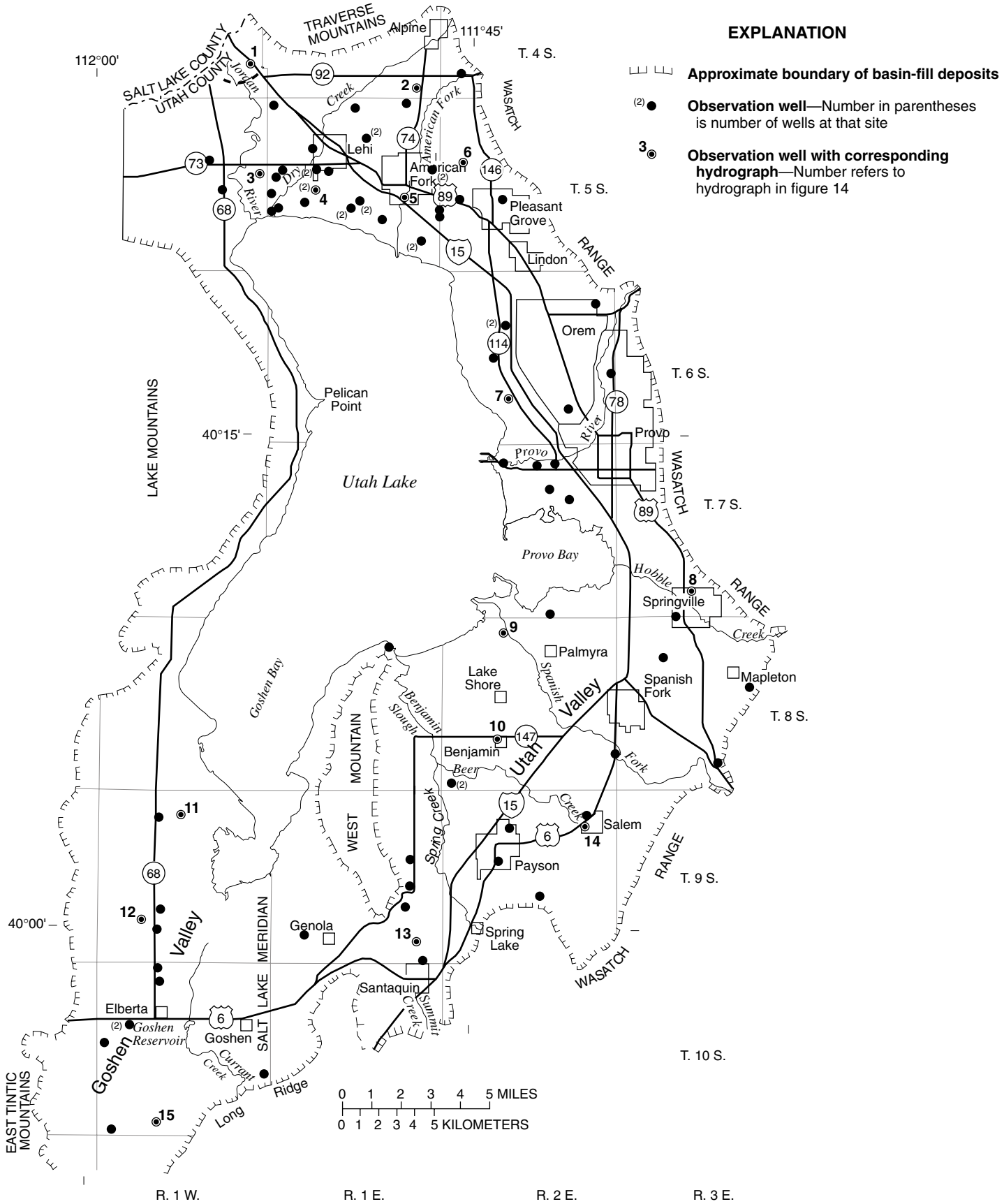

Figure 13. Location of wells in Utah and Goshen Valleys in which the water level was measured during March 1999.

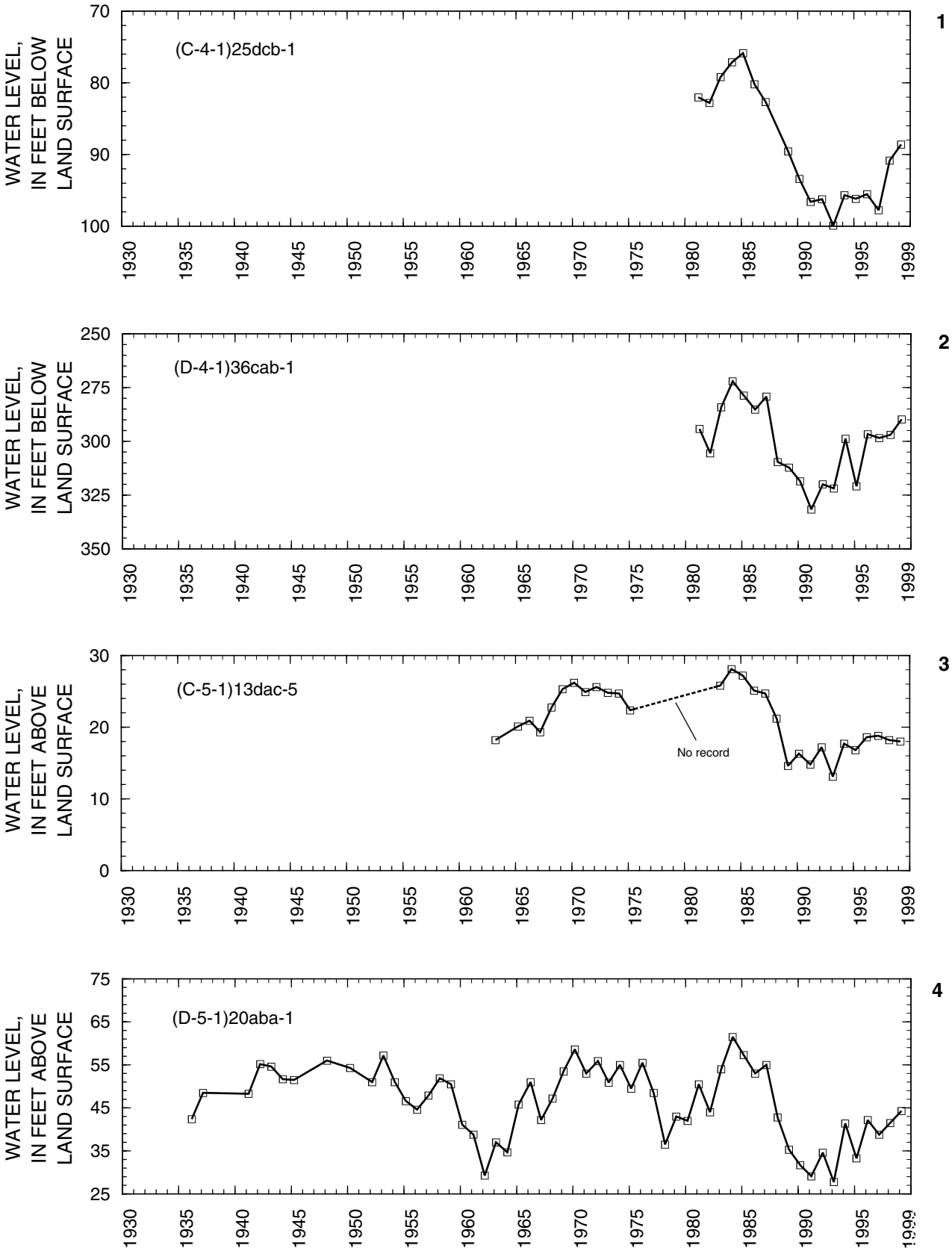

Figure 14. Relation of water level in selected wells in Utah and Goshen Valleys to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of Spanish Fork at Castilla, and to concentration of dissolved solids in water from three wells.

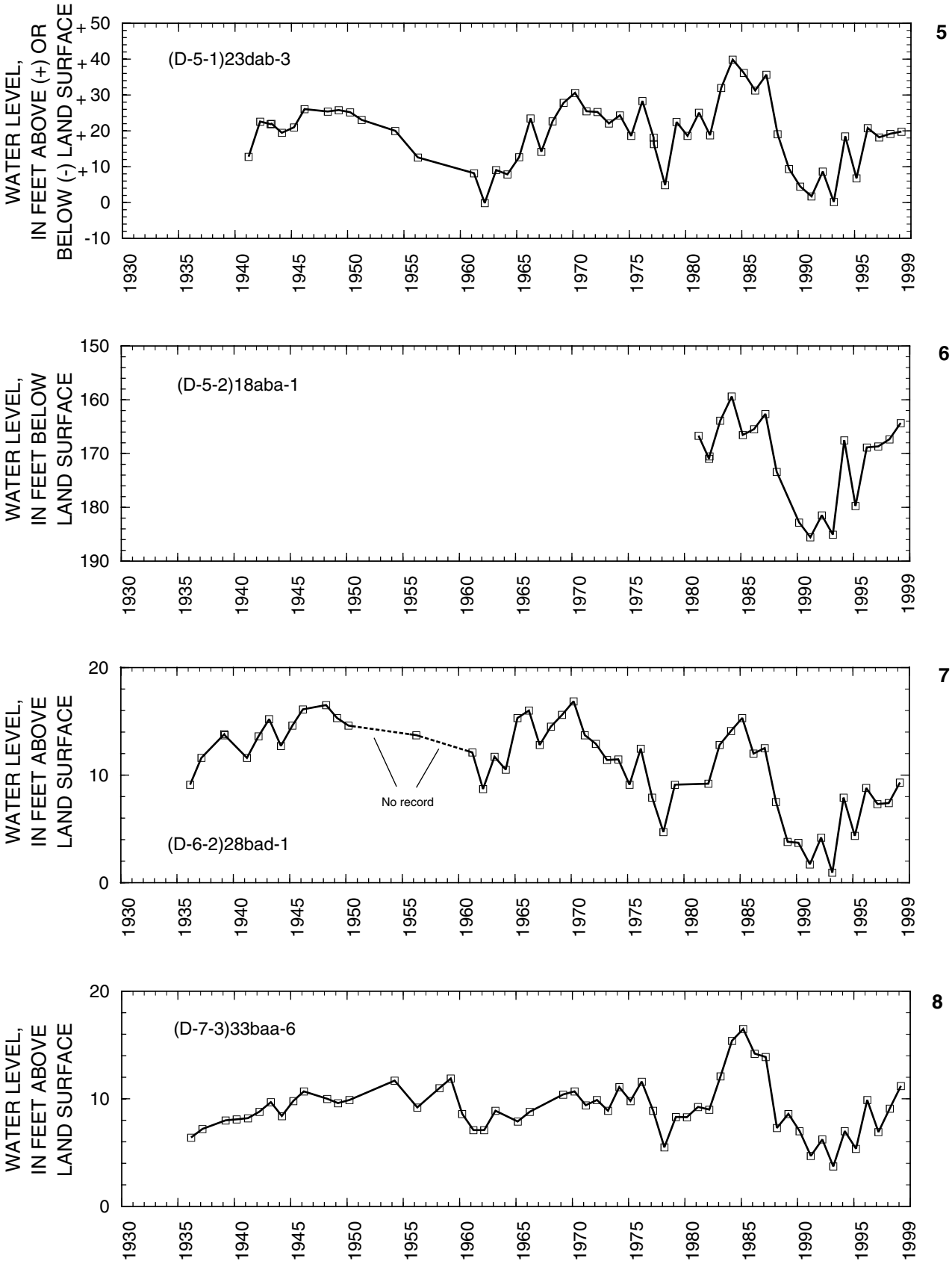

Figure 14. Relation of water level in selected wells in Utah and Goshen Valleys to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of Spanish Fork at Castilla, and to concentration of dissolved solids in water from three wells—Continued.

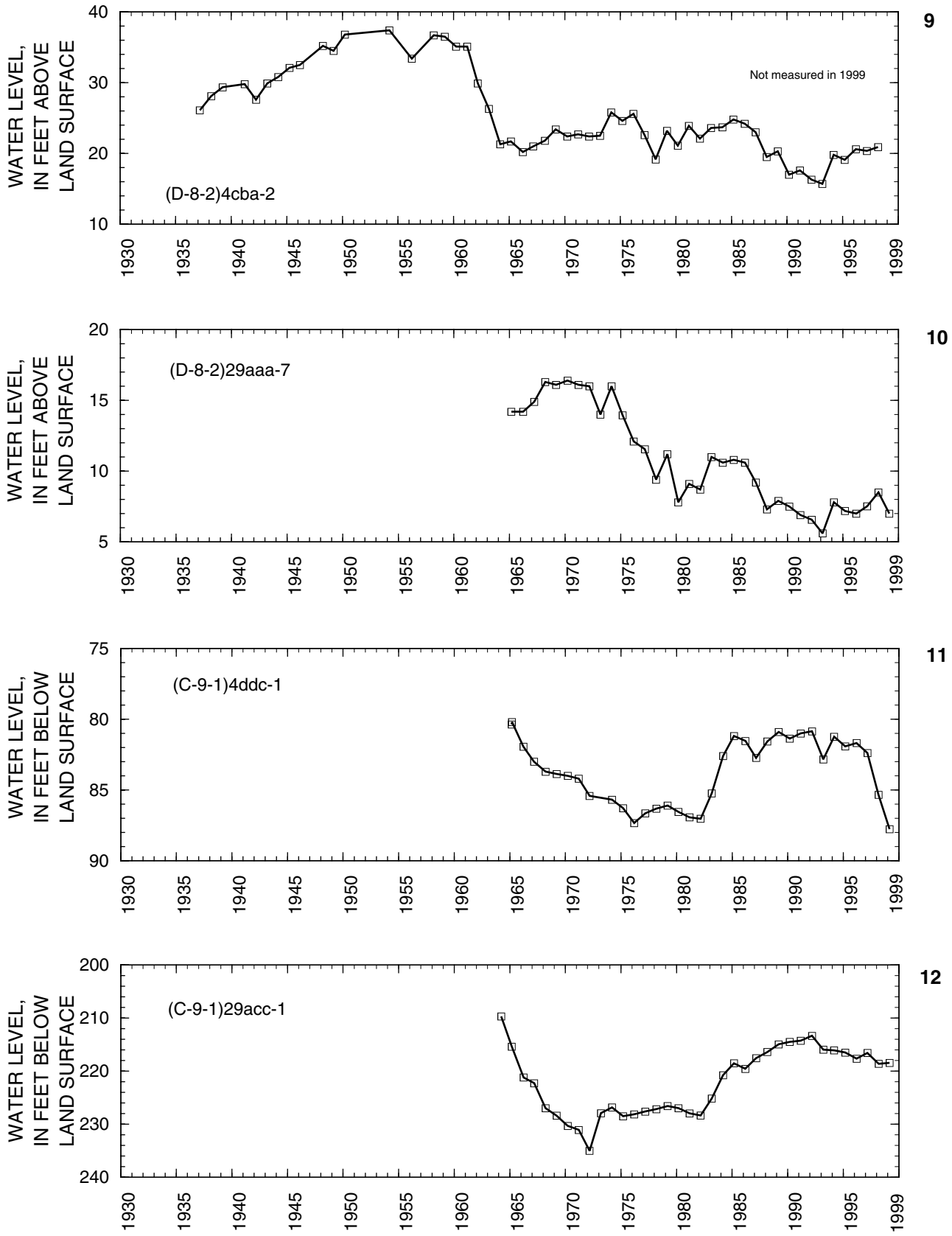

Figure 14. Relation of water level in selected wells in Utah and Goshen Valleys to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of Spanish Fork at Castilla, and to concentration of dissolved solids in water from three wells—Continued.

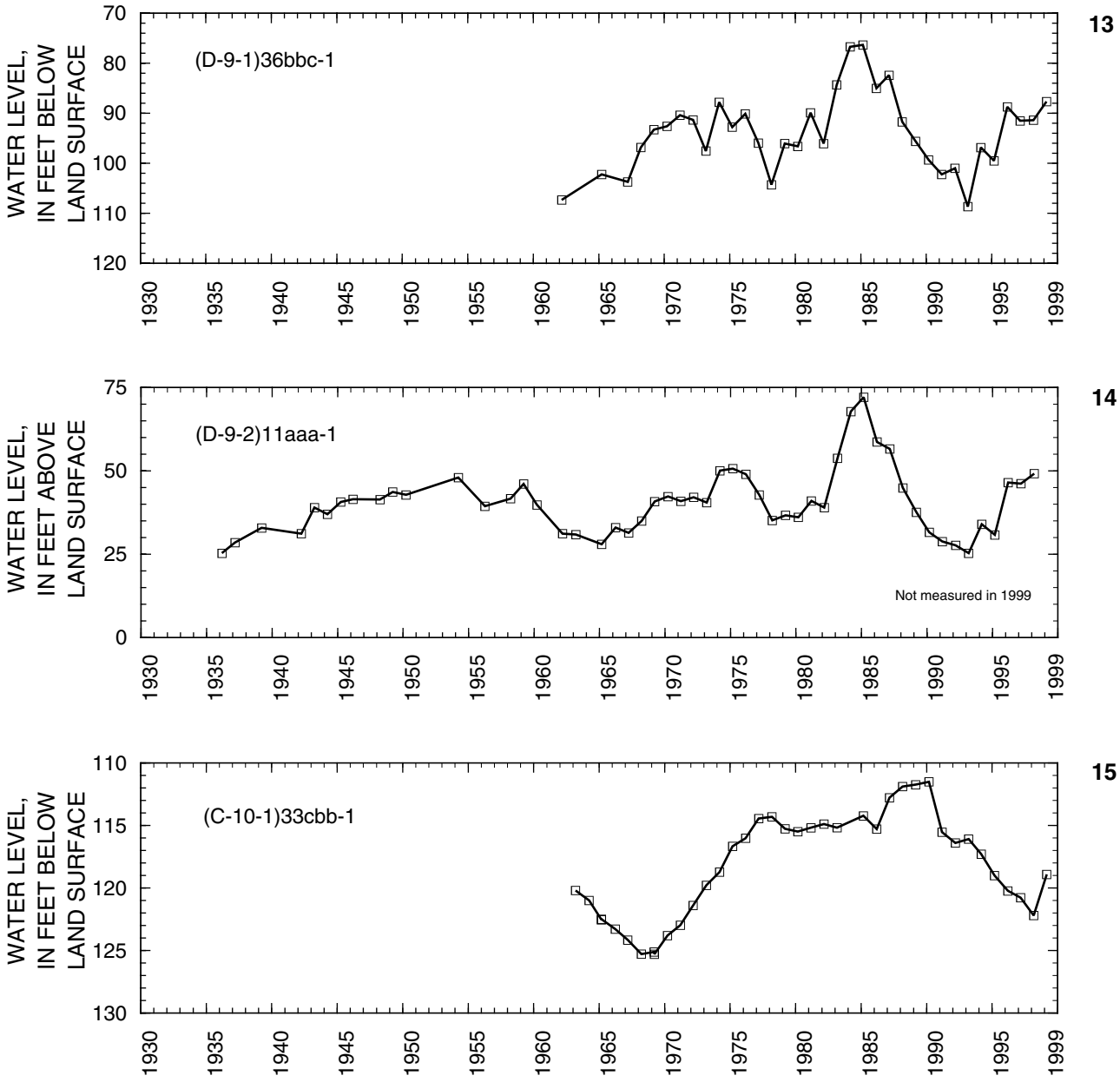

Figure 14. Relation of water level in selected wells in Utah and Goshen Valleys to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of Spanish Fork at Castilla, and to concentration of dissolved solids in water from three wells—Continued.

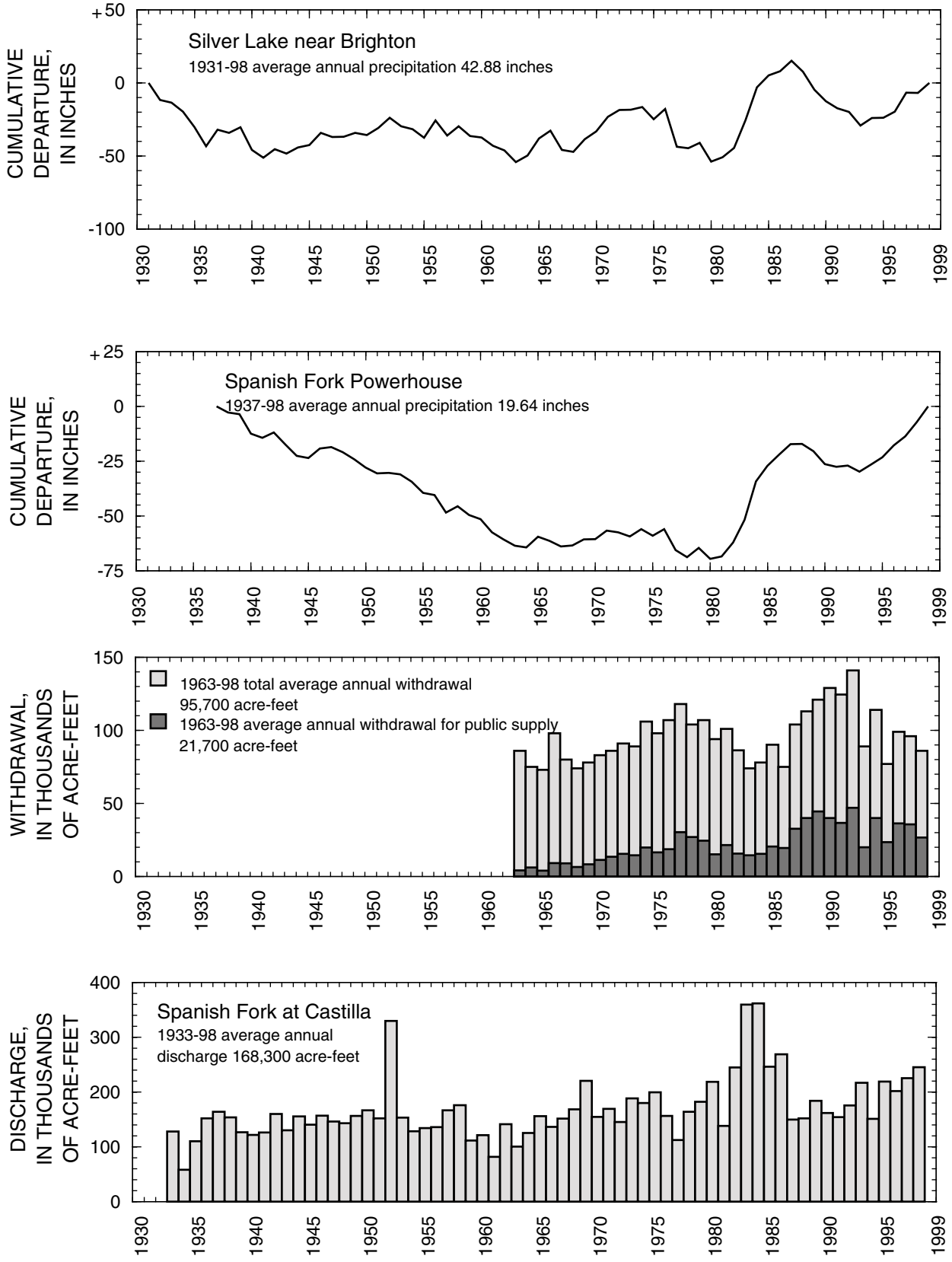

Figure 14. Relation of water level in selected wells in Utah and Goshen Valleys to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of Spanish Fork at Castilla, and to concentration of dissolved solids in water from three wells—Continued.

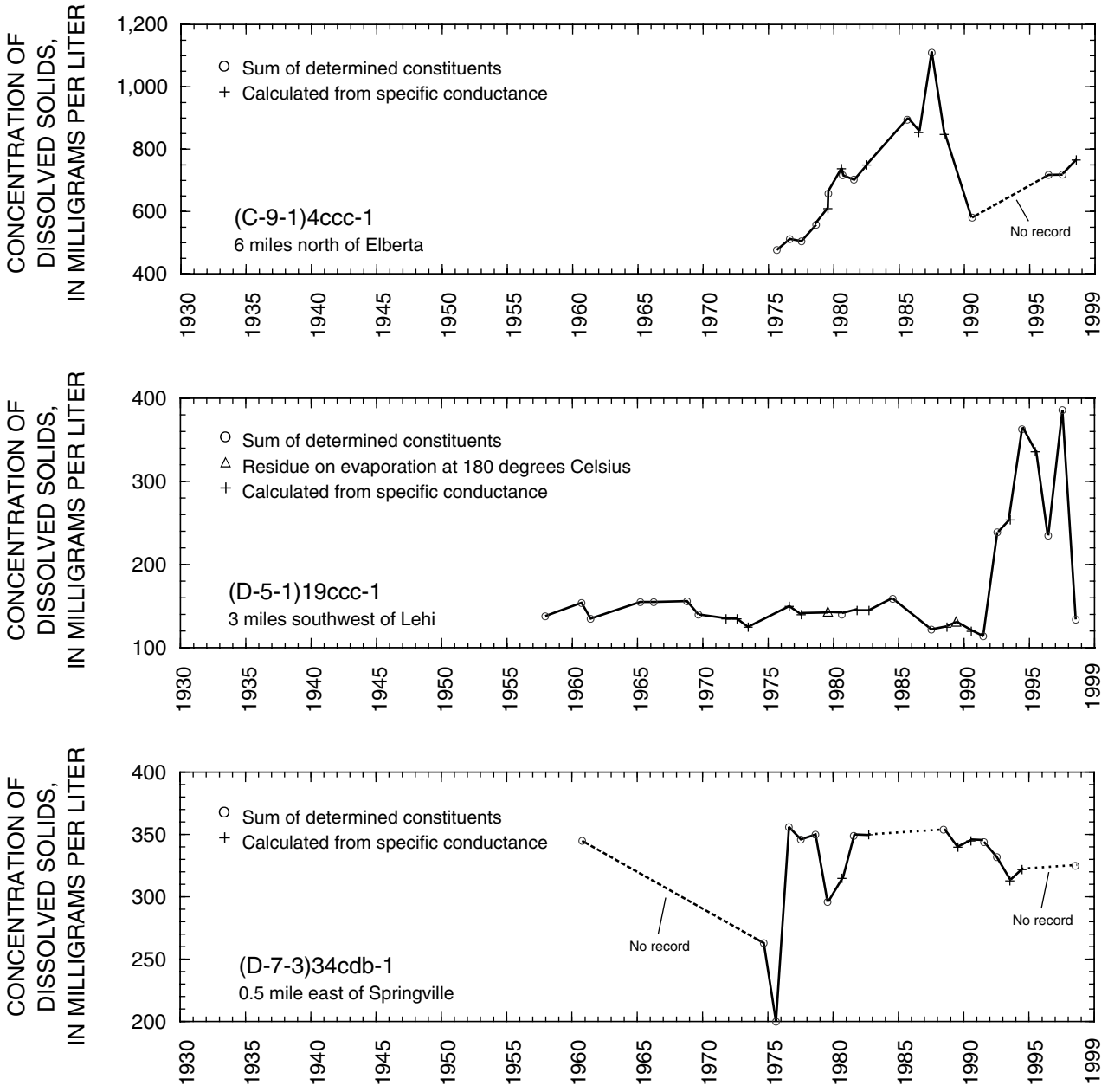

Figure 14. Relation of water level in selected wells in Utah and Goshen Valleys to cumulative departure from average annual precipitation at Silver Lake near Brighton and Spanish Fork Powerhouse, to total annual withdrawal from wells, to annual withdrawal for public supply, to annual discharge of Spanish Fork at Castilla, and to concentration of dissolved solids in water from three wells—Continued.