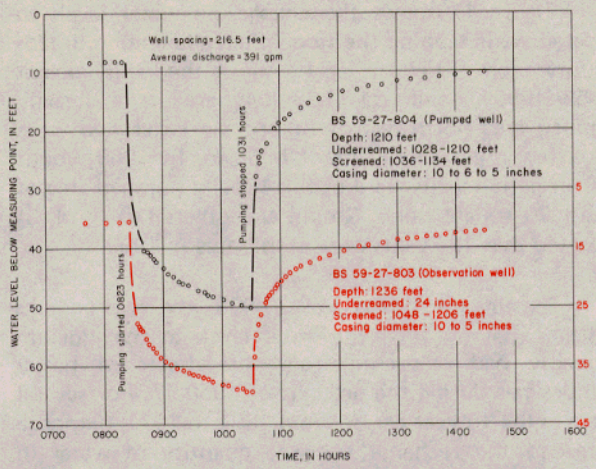

Figure 14.—Drawdown and Recovery in a Pumped Well and the Drawdown Interference and Recovery in an Observation Well During an Aquifer Test in Caldwell City Wells, February 18, 1971

pumping by about 60 percent. A substantially wider spacing between wells would have eliminated much of this interference and additional cost.

Where irrigation wells in the flood-plain alluvium are closely spaced, pumping lifts may be significantly increased by interference between wells. The yields of the wells thus affected may also be reduced. The magnitude of interference can be determined from Figure 15, which shows the theoretical extent of the cone of depression of a well in the flood-plain alluvium that has been pumping continuously for 30 days at rates of 250, 500, 750, and 1,000 gpm. Three assumptions are inherent in the graphs: the transmissivity is 2,670 and 5,350 feet squared per day; the storage coefficient is 15 percent; and all the water being pumped is coming from storage in the aquifer.

Where the transmissivity is 2,670 feet squared per day, a well pumping 500 gpm for 30 days would cause a drawdown of about 6 feet in another well 400 feet from the pumped well and a drawdown of about 2 feet in a well at a distance of 1,000 feet. However, if the transmissivity is 5,350 feet squared per day, the drawdown would be almost 4 feet at a distance of 400 feet from a well pumping 500 gpm for 30 days. Drawdown interferences can be determined from the graphs for other pumping rates and distances that are applicable to specific wells.

Specific capacities were determined for several wells tapping various aquifers in the report area. The specific capacities of 14 wells are listed in Table 6. The specific capacities ranged from 0.65 gpm per foot of drawdown in a well tapping the Yegua Formation to 48 gpm per foot of drawdown for a well tapping the Sparta Sand. Additional specific capacities for many wells are

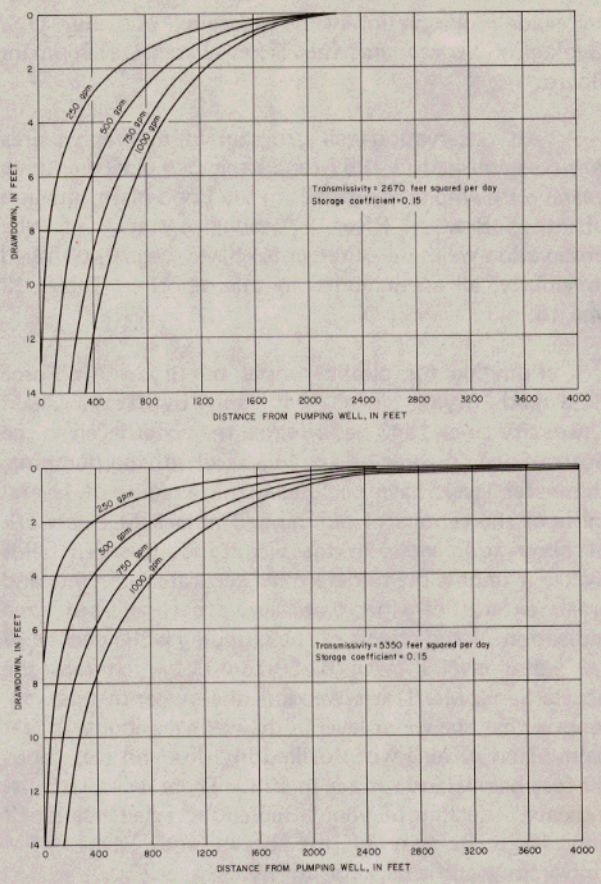

Figure 15.—Theoretical Drawdown Caused by a Well in the Flood-Plain Alluvium Pumping Continuously for 30 Days

available from the well-performance data given in Table 12. From these data, the specific capacity can be calculated by dividing the yield in gpm by the drawdown in feet.

The largest value of specific capacity was 75 gpm per foot of drawdown in well BS-59-38-704 tapping the flood-plain alluvium of the Brazos River. Specific capacities of wells tapping the same formation may differ widely because of the differences in the amount of sand screened, the differences in well construction, the degree of well development, and the differences in pumping time.

Changes in Water Levels

Water-level measurements were made in wells during previous studies of parts of the report area in 1936-37, 1944, 1947, 1959-60, and 1963-64, and as a part of this study in 1969-71. Unfortunately, most of these measurements, except for those in wells tapping the flood-plain alluvium, were not made in the same wells during each succeeding study. However, measurements were made in a few selected observation wells in Brazos and Burleson Counties during 1937-41 as part of the