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Water Resources of Spartanburg County, South Carolina

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ABSTRACT

As a source of supply, the streams of Spartanburg County afford many times the quantity of water presently required. Total withdrawal of streamflow is about 50 cfs (cubic feet per second) or 33 mgd (millions gallons per day)—about 4 percent of the mean annual flow. Low-flow characteristics of the streams, emphasized in this report, are important factors in the utilization of streamflow during critical periods. The magnitude, duration, and frequency of low flows are analyzed to determine the available streamflow and to develop draft-storage relations.

Basin characteristics of the larger unregulated streams are shown to be similar by the shape and plotting position of the duration and frequency curves. The mean annual flow occurs at about the 30 percent duration point, and the minimum annual 7-day low flows anticipated at average intervals of 2 and 10 years occur at approximately the 90 and 99 percent duration points, respectively. Streams in the northern part of the county have the higher unit runoff, show less variability, and are better sustained at low flow than those in the southern part. The minimum annual 7-day, 10-year flow of North Pacolet River at Fingerville is 0.34 cfs per square mile compared with 0.16 cfs per square mile of Enoree River at Enoree. The smaller streams, demonstrated a marked variability of flow on an areal basis. The 7-day low-flow at 10-year recurrence intervals are displayed in a pattern of 3 gradations—0.07 to 0.11, 0.13 to 0.20 and 0.22 to 0.29 cfs per square mile. Flows at other recurrence intervals do not conform to this pattern. The degree of channel incisement is believed to account for the unexpected low yields of several streams that intersect or flow in formations containing wells with relatively high yields.

Streamflow was found sufficient to meet draft requirements of about 50 percent of the mean annual flow with seasonal storage. Over-year storage is required for greater draft-rates, although drafts over 60 to 70 percent of the mean annual flow are probably not economically feasible.

The surface waters have excellent quality for most uses. The content of dissolved solids is low and the water is soft. A discharge of waste, however, was evident in several streams—the North, Middle and South Tyger Rivers and Fairforest Creek.

Spartanburg County lies within the Inner Piedmont belt, and wells drilled in the granitic, biotitic, and hornblendic rocks, characteristic of this region, yield from 1 to 250 gpm (gallons per minute). The highest average yields (35 gpm) of the wells inventoried were obtained from those drilled in the biotite gneiss and migmatite. Wells drilled in quartz monzonite had the lowest

average yields. The average yield of all wells for which data were available was 20 gpm. The average for those wells drilled to obtain their maximum development was 53 gpm. The average yield for the highest 3 percent was 139 gpm. The 7-day, 2-year low-flow yield of streams throughout the county ranges from 0.23 to 0.43 mgd per square mile (160-292 gpm per sq mi), which represents a minimum quantity available for groundwater development.

Ground waters in Spartanburg County are of good to excellent quality for most domestic, municipal, and industrial use. Most of the waters sampled were soft, slightly acidic, and low in dissolved solids.

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