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The Ground-Water Resources of Sumter and Florence Counties, South Carolina

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ABSTRACT

An abundant supply of good quality ground water exists in Sumter and Florence Counties. Water users in the two counties are greatly dependent on this ground water, and both counties rank among the highest in the state in terms of total ground-water use. Ground water currently supplies 100 percent of the drinking water needs of public and rural-domestic water users. More than 30 Mgd (million gallons per day) of ground water are withdrawn for public supplies and rural-domestic, industrial, and agricultural use. Approximately 25 Mgd are withdrawn from surface-water sources.

The sources of ground-water supply are the Tuscaloosa, Black Creek, Peedee, and shallow aquifer systems. Artesian aquifers within the Tuscaloosa and Black Creek aquifer systems provide almost half of the ground water withdrawn. These aquifers underlie the entire study area, and 10- and 12-inch diameter wells commonly yield from 500 to 2000 gpm (gallons per minute) per well. The hydraulic conductivities of Tuscaloosa and Black Creek aquifers range from 19 to 93 ft/day and generally increase from east to west.

The shallow and Peedee aquifer systems supply sufficient quantities of water for domestic and light industrial use. Individual wells tapping shallow aquifers in central and northern Sumter County yield up to 250 gpm, and are capable of supplying large quantities of ground water for industrial and municipal use.

The chemical quality of the ground water is generally good. Total dissolved solids concentrations in the principal aquifers of Sumter County are commonly less than 100 mg/L, and in Florence County are commonly less than 200 mg/L. Chloride and sulfate concentrations are less than 50 mg/L.

High iron concentrations and corrosive ground water are problems for some water users in the study area. The maximum iron concentration recommended by the South Carolina Department of Health and Environmental Control is 0.3 mg/L, whereas ground water may locally contain more than 5.0 mg/L. In addition, the corrosive effect of high carbon dioxide concentrations and low pH results in abnormally short service life for some large-capacity wells. Shallow aquifers have been locally contaminated by nickel, nitrates, and petroleum products; and excessive application of fertilizers may be having a regional impact on shallow aquifers in the Florence area.

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