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Ground-Water Conditions in the Ladies and St. Helena Islands Area, South Carolina

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ABSTRACT

The Ladies and St. Helena Islands study area is composed of approximately 175 square miles in the southeast corner of South Carolina. The surface area is flat, consisting of several islands interconnected by saltwater estuaries and marshland. The majority of the 10,303 inhabitants live on the two largest islands, Ladies and St. Helena.

Ground-water supplies are available from several underlying formations, including the Middendorf, Black Creek, Peedee, Black Mingo, Santee, and shallow deposits. However, the best potential source of ground water in the area is the upper Floridan aquifer, encompassing the Santee Limestone. It is composed of limestone of Eocene age that underlies the entire study area at depths ranging from 30 to 120 feet below the surface and is at least 25 feet thick.

The principal recharge areas for the upper Floridan aquifer in this area are located in the northwestern portion of the study area, in northern Ladies Island, and in the central part of St. Helena Island. This recharge is the direct result of rainfall entering the aquifer through a shallower aquifer in areas where the overlying confining unit is thin or absent and, possibly to some extent, through sinkholes. Water levels in these areas are as high as 19 feet above sea level, producing a hydraulic gradient of as much as 15 feet per mile locally. Movement occurs radially away from island masses towards local rivers, estuaries, and the Atlantic Ocean.

Seasonal water-level fluctuations are observed in areas of heavier warm-weather pumping for crop and golf-course irrigation. Continual fluctuation in wells affected by tidal oscillations accounts for 0.23 to 4.51 feet of daily change in static water levels.

The chemical quality of water in the upper Floridan aquifer is generally good. Chloride, dissolved solids, and hardness concentrations nearest to recharge areas are well below the U. S. Environmental Protection Agency recommended maximums for drinking water. These concentrations increase towards areas of lower potentiometric head, making the water unfavorable for domestic and, in some cases, irrigational use. Iron and hydrogen sulfide concentrations are locally high in several places.

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