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A Geological Approach to Modeling the Movement of Ground Water in the Shallow Aquifer in the Vicinity of the Burton Recharge Area, Beaufort, South Carolina: Phase 1

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ABSTRACT

The Burton recharge area, located on Port Royal Island in Beaufort County, S.C., is the largest, and possibly the only, major recharge area for the Floridan aquifer on Port Royal Island. The amount of recharge is dependent upon several factors; one of the most important is the presence or absence of the confining unit separating the shallow unconfined aquifer from the deeper artesian aquifer, another is the textural characteristics of the overlying sediments. The present geologic study indicates that these factors are controlled by the depositional history of the shallow aquifer. Using surface geophysical methods (DC resistivity and multichannel seismic refraction) as the principal mapping tools, and available well and borehole data as a control, a depositional model was developed for the shallow aquifer in order to understand the movement of ground water in that aquifer.

During the Pleistocene, the area that is now the Burton recharge area was inundated by numerous marine transgressions and regressions. The area appears to have been a sand-dominated back barrier or lagoon environment during one regression. Tidal channels meandered throughout the back barrier system and appear to have eroded the Hawthorne Formation, allowing tidal channel sand to be deposited directly on the limestone. The channel deposits also controlled the textural characteristics of the sand. Where channeling occurred, the sand generally is well sorted and very fine grained with little or no clay and silt. The sand also generally coarsens downward to the limestone, providing an excellent pathway for water migration from the land surface to the limestone aquifer.

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