GROUNDWATER MODELING TO EVALUATE INTERAQUIFER LEAKAGE IN THE FLORIDAN AQUIFER SYSTEM IN COASTAL GEORGIA

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Abstract. A regional groundwater-flow model was used to determine the influence of pumping the Lower Floridan aquifer (LFA) on the amount of leakage from the Upper Floridan aquifer (UFA) at three sites in coastal Georgia. At each site, steady-state simulations were performed whereby newly constructed production wells tapping the LFA at Hunter Army Airfield (HAAF), Fort Stewart (FS), and the City of Pooler were pumped at a rate of about one million gallons per day to evaluate the long-term effects of pumping on the Floridan aquifer system.

Separate models were developed for each of the three sites to simulate drawdown response and to quantify interaquifer leakage in the UFA and LFA near the new LFA production well. Existing model grid resolution, hydrogeologic unit depth and thickness, and hydraulic properties were adjusted based on aquifer test data from each of the sites. Results of model simulations indicate that interaquifer leakage from the UFA into the LFA accounted for 49 percent of the flow to the well at HAAF, and 98 percent of the flow at FS and the City of Pooler. Sensitivity analysis of hydraulic properties within the largest hydraulic property zone, which includes HAAF and Pooler, indicates that simulated head is most sensitive to changes in horizontal hydraulic conductivity of an aquifer, and that varying hydraulic properties had little effect on net inflow from general head boundaries (recharge), lateral specified head boundaries, and on interaquifer leakage between the UFA and LFA.