

## City of Albany Cooperative Water Program

Study Chief     Debbie Warner Gordon  
 Cooperator     Albany Water, Gas, and Light Commission  
 Year Started    1977



### Problem

Long-term heavy pumping from the Claiborne and Clayton aquifers and the Cretaceous aquifer system (includes the Providence aquifer), which underlie the Upper Floridan aquifer, has resulted in substantial water-level declines in these deep aquifers in the Albany area. To provide additional water supply and reduce the demand on the deep aquifers, the Albany Water, Gas, and Light Commission (WGL) developed a large well field southwest of Albany. The supply wells at this location primarily penetrate the Upper Floridan aquifer, a karstic unit that is the uppermost reliable source of water in the area. Because of local recharge to the aquifer, water quality may be affected by land-use practices. Nitrate levels exceeding the 10-milligrams per liter maximum contaminant level (U.S. Environmental Protection Agency, 2000) have been detected in some wells upgradient from the well field.

### Objectives

- Monitor water-level fluctuations in the four deep aquifers in the Albany area and relate water-level trends to changes in climatic conditions and pumping patterns.
- Describe the ground-water flow and water quality of the Upper Floridan aquifer near the new well field in the southwestern Albany area.

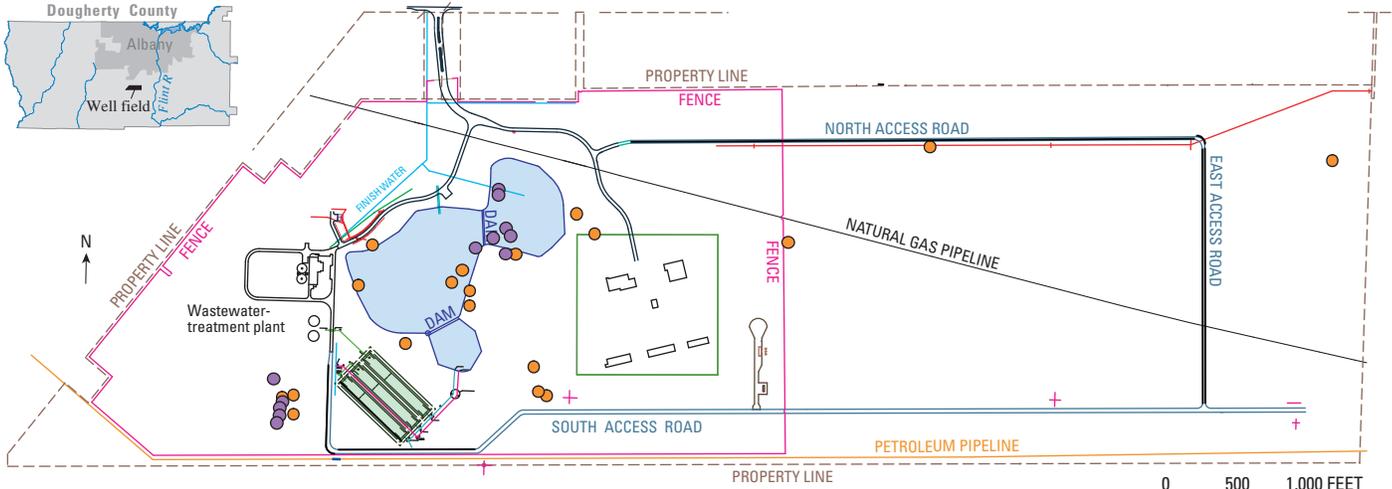
### Progress and Significant Results, 2006–2007

- Continued operation of the 14-well continuous ground-water-level monitoring network in the surficial, Upper Floridan, Claiborne, Clayton, and Providence aquifers.
- Continued ground-water-quality monitoring program. Water samples were collected and analyzed for cations, anions, and nutrients during November 14–16, 2006 (14 wells), and October 15–18, 2007 (12 wells).
- Constructed potentiometric-surface maps for the Upper Floridan aquifer near the well field based on measurements from 64 wells during October 16–24, 2006, and 60 wells during October 23–25, 2007. Both maps indicate that water generally flows from northwest to southeast near the well field. Although water levels during 2006 and 2007 generally were lower than during 2005, the well-field pumping did not result in the formation of a cone of depression surrounding the well field.

- Published “Potentiometric surface of the Upper Floridan aquifer in the southwestern Albany area, Georgia, 1998–2005, based on revised land-surface altitudes” (Gordon, 2006). The enhanced land-surface accuracy improved delineation of ground-water flow in the area.
- Continued to map sinkholes at the well field. No new sinkholes formed during 2006; however, during 2007, 12 new sinkholes developed.
- Continued to develop ground-water flow model for the well-field area. A variety of changes were made to the model design, including layering and boundary conditions. An extended abstract and poster presentation describing model development and preliminary results were prepared for the 2007 Georgia Water Resources Conference in Athens, March 27–29, 2007 (Gordon and Payne, 2007).

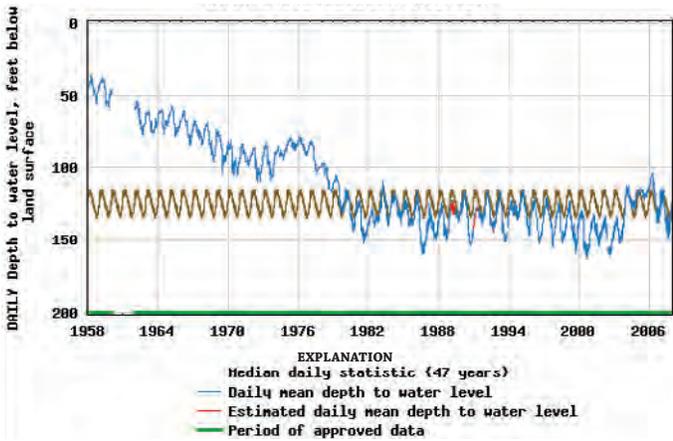
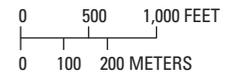
### References

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- Clarke, J.S., Faye, R.E., and Brooks, Rebekah, 1984, Hydrogeology of the Clayton aquifer of southwest Georgia: Georgia Geologic Survey Hydrologic Atlas 13, 6 pls.
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- Gordon, D.W., and Payne, D.F., 2007, Simulation of ground-water flow and nitrate transport in the Upper Floridan aquifer in the southwestern Albany area, Georgia, *in* Proceedings of the 2007 Georgia Water Resources Conference, March 27–29, 2007: Athens, Georgia, The University of Georgia, available on the Web at [http://ga.water.usgs.gov/publications/gwrc07/pdf/Gordon\\_GWRC07.pdf](http://ga.water.usgs.gov/publications/gwrc07/pdf/Gordon_GWRC07.pdf).
- U.S. Environmental Protection Agency, 2000, Maximum contaminant levels (Part 143, National Secondary Drinking Water Regulations): U.S. Code of Federal Regulations, Title 40, Parts 100–149, rev. as of July 1, 2000, p. 612–614.

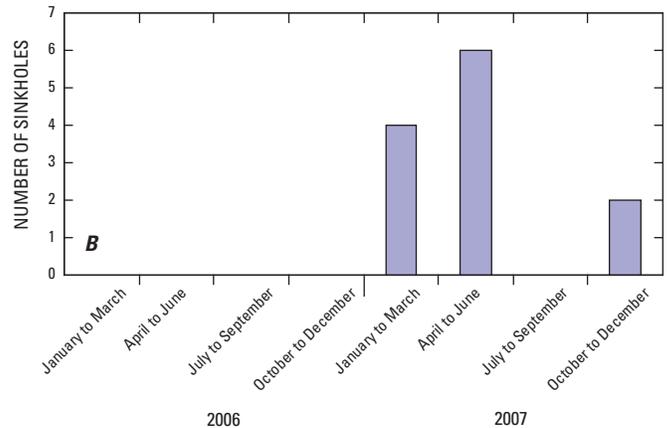
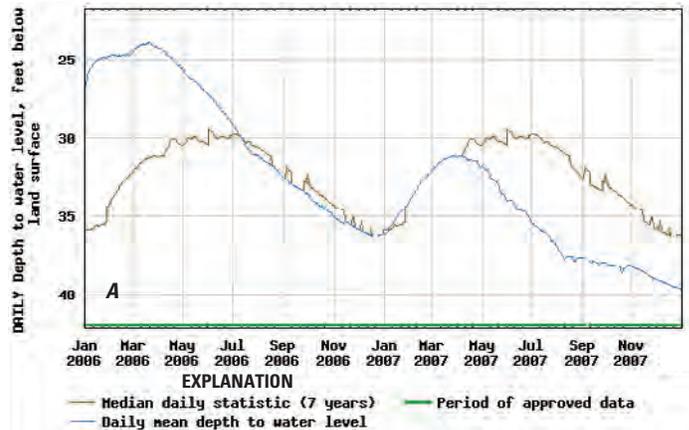


Locations of sinkholes at the Albany well field. (Base map and sink-hole locations provided by Albany Water, Gas, and Light Commission.)

**EXPLANATION**  
 Sinkhole—Year developed  
 ● Prior to 2007 ● 2007



In the Albany area, water level in the Clayton aquifer declined from 1957 to the mid-1970s, as pumping by the city of Albany increased. The rate of decline increased from 1977 to 1981 as seasonal irrigation pumping increased (Clarke and others, 1984). Since 1981, water levels have stabilized because the Georgia Environmental Protection Division (GaEPD) imposed restrictions on pumping by the city of Albany, and the city instituted a management strategy using water levels to determine which wells to pump (Barber, 1997). During 1992, the GaEPD placed a moratorium on new withdrawals from the Clayton aquifer. Despite these measures, drought conditions during 1998–2002 resulted in increased withdrawals by permitted water users, and a record-low water level was measured on September 3, 2000.



Flint River in Albany, Georgia. Photo by Debbie Warner Gordon.

(A) Water level in the Upper Floridan aquifer near the Albany well field was above the median daily value from January to July 2006, near median levels through July 2007, and below median levels through the end of 2007. (B) Twelve sinkholes formed in the well field during 2007; these sinkholes may have developed because of low water levels.