Assessment of the Water Resources of Rockland County, NY, with Emphasis on the Sedimentary Bedrock Aquifer

Cooperators

Rockland County
New York State Department of Environmental Conservation

Background/Problem

Ground water pumped from the sedimentary bedrock aquifer that underlies southeastern Rockland County is a major source of public water supply. Extensive suburban development has increased water-supply demands over the last 40 years to the point where the aquifer is considered fully developed in terms of wellfield spacing. Continued development in the County has led to progressive increases in withdrawals from existing wellfields. This situation raises serious concerns about the sustainability of withdrawals from the aquifer.

The County Health Department reported that 2000 and 2001 withdrawals approached or exceeded estimates of recharge that replenishes the aquifer. Recharge has been decreased by: 1) the export of wastewater (originally ground water) in sanitary sewers outside the aquifer area and 2) increases in stormflow and loss of aquifer recharge as the amount of impervious land surface increases with continued suburban development.

The chemical quality of ground water is an additional concern, in that contamination decreases the water supply or requires costly treatment. Bedrock aquifers are particularly susceptible to contamination from human activities at land surface, and several supply wells in this aquifer have been taken off line or have had treatment systems installed to remove contaminants. Definition of source waters contributing to supply wells improves the ability to protect and manage the aquifer.

The current situation calls for further characterization of the aquifer framework, documentation of aquifer and stream responses to present-day ground-water withdrawals, numerical modeling of the stream-aquifer system. Such information can be used by water managers to ensure the long-term sustainability of this critical resource.

Objectives

This study will provide a characterization of the aquifer framework and water chemistry, measurement of ground-water levels, documentation of aquifer and stream responses to present-day ground-water withdrawals, and surface-water resource evaluation in the Hudson Highlands part of the county. Aquifer information will be used to develop a numerical ground-water flow model. A flow model can be used to estimate contributing areas to supply wells and to evaluate the ground-water-level responses to different pumping and rainfall conditions. Water managers and regulatory agencies can use this information to ensure the long-term sustainability of this critical resource.

Questions the study will address:

1. Are current ground-water withdrawal rates depleting the aquifer?
2. Can rainfall and pumpage data serve as a guide for sustainable withdrawal rates from supply wells?
3. How much recharge does the aquifer receive?
4. What are the sources of water to supply wells?
5. How much water is available from selected upland stream basins?

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