OHIO GROUND WATER CONDITIONS

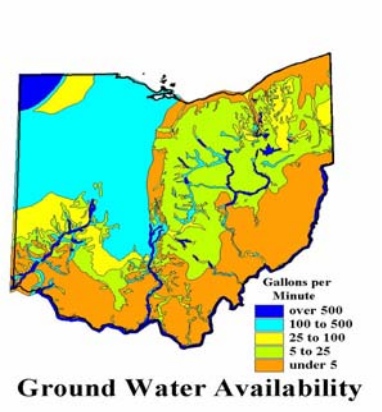
Why is Ground Water Important?

Ground water has played a vital role in the development and settlement of Ohio.

- Approximately 95% of public water systems use ground water as their source of drinking water.
- More than 700,000 households have their own wells to meet all their water needs.
- Agriculture depends on approximately 2 billion gallons per year.
- Industry uses more than 257 million gallons per day.

Where are Ohio's Ground Water Resources?

The amount of ground water available for use by Ohioans is directly related to the geologic history of this region. Some aquifers are capable of producing over 500 gallons per minute to individual wells and are the source of water for many of Ohio's cities and villages (blue areas on the map). In many portions of the state development is focused around these high-capacity aquifers. Other aquifers produce 1 or 2 gallons per minute (orange areas on the map), and can only provide water to small businesses and individual residences.



Ground Water Availability

Ground Water Quality and Quantity

Ohio collects baseline ground water quality and quantity data for all of Ohio's aquifers. The Ohio Environmental Protection Agency (Ohio EPA) monitors ground water quality through a network of over 200 water wells. The Ohio Department of Natural Resources (ODNR) monitors water levels in major aquifers to assist with water planning and conservation. The Ohio Department of Health (ODH) samples for bacteria and nitrate in newly installed private water systems (approximately 13,000/year). Other federal, state and local organizations collect ground water quality and quantity information in Ohio to support and supplement these data.

Ground Water Contamination

In some portions of the state ground water is protected by a thick blanket of clay, a material that helps stop contaminants from reaching the aquifer. A large percentage of Ohio's aquifers, however, do not have a protective clay layer and are relatively vulnerable to contamination. Unfortunately, some of Ohio's aquifers have already suffered from contamination. Nearly a dozen Ohio communities have installed air stripper treatment systems to remove solvents from the ground water that is their source of drinking water supply. The costs of investigating contamination and installing treatment systems typically are at least $1 million; operation and maintenance costs these communities tens of thousands of dollars annually.

In addition to industrial and agricultural chemicals, nitrates and microorganisms in ground water are a concern, especially for Ohioans with private wells, which usually do not have disinfection systems. Bacteria such as *E. coli* can be found in private well systems, and can cause serious illness. Finally, some Ohio ground waters contain significant amounts of naturally-occurring arsenic, which can be toxic to humans at high enough concentrations. Where ground water is contaminated, homeowners with wells must purchase costly water treatment systems, or use bottled water.

How is Ohio Protecting its Ground Water Resources?

In 2001, Ohio's Governor established the Ohio Water Resources Council (OWRC) to identify critical issues that impact Ohio's water resources. The OWRC has developed a plan with 29 objectives for action designed to strengthen collaboration among state, local and federal partners to address improvements in water quality and quantity, watershed protection, regulatory programs, public and private water systems, water-based recreation and citizen involvement. In addition, Ohio state

agencies coordinate their efforts to protect ground water resources through the State Coordinating Committee on Ground Water. The Committee includes:

Ohio EPA: Ohio EPA cleans up contaminated ground water through the RCRA Corrective Actions Program, the Emergency and Remedial Response Programs, the Voluntary Action Program (for clean-up of brownfields), the Federal Facilities Program, and the Clean Ohio initiative, which provides grants for local clean-up initiatives. Ohio EPA also regulates new and existing waste disposal facilities through the RCRA hazardous and solid waste programs. Ohio EPA's Underground Injection Control Program monitors and regulates the injection of waste into ground water. Finally, Ohio EPA identifies vulnerable aquifers through its Ambient Ground Water Monitoring Program, and promotes strategies to protect them from contamination through its Source Water Assessment and Protection Program and grants from the Clean Water Act Chapter 319 program.

ODNR: ODNR inventories ground water levels through its observation well network, and monitors ground water withdrawals by facilities pumping large amounts. Its Division of Soil and Water Conservation works to protect ground water from nonpoint source impacts. The Division of Water maintains an inventory of well logs, performs aquifer dewatering studies, and completes county-wide maps of ground water resources.

ODH: ODH permits and inspects water wells and septic disposal systems for private residences. It conducts special studies (sampling private wells) in areas of suspected ground water contamination.

ODA: The Ohio Department of Agriculture (ODA) monitors pesticides in ground water through a statewide monitoring well network and regulates waste disposal at concentrated animal feeding operations (CAFOs).

Also represented are: U.S. Geological Survey, Public Utilities Commission of Ohio, Natural Resource Conservation Service, the Ohio Agricultural Extension, and the Ohio Department of Commerce.

Needs Identified by the State Agencies

The OWRC's Four-Year Strategic Plan highlights the need for coordination of ground water and surface water issues through watershed planning. Enhanced educational resources and the development of a comprehensive and accessible database of ground water information are also high priorities.

Resources are needed to better characterize Ohio's ground water and to identify and apply appropriate protection strategies. Specifically, additional state/federal funding is needed to:

1. Evaluate impacts of land uses and potential contaminant sources on ground water quality.
2. Develop detailed 3-D geologic frameworks to support improved ground water flow models and characterization of surface water-ground water interactions.
3. Convert critical ground water data to electronic files that can be easily accessed and made available on the Internet.
4. Complete ground water vulnerability maps.
5. Provide funds for local implementation of ground water protection strategies.
6. Characterize ground water and surface water interactions.
7. Develop education materials targeted at the general public, commercial businesses, industry, and agriculture.
8. Ensure adequate regulation of underground injection wells, non-potable wells and boreholes.
9. Implement a more aggressive program for sealing unused wells, boreholes, or other types of holes that penetrate aquifers with state/federal cost sharing to assist with sealing costs.
10. Provide improved assessment of the presence of naturally occurring constituents in Ohio aquifers used for drinking water supply that present potential public health concerns.
11. Implement certification/licensure for water well drillers.
12. *Provide enhanced coordination of private and public/commercial/industrial wastewater regulatory programs.*