Rhode Island
Department of HEALTH

PROTECT YOUR DRINKING WATER

Safe and healthy lives in safe and healthy communities

Kent County Water Authority Drinking Water Assessment Results

Each day the Kent County Water Authority (KCWA) supplies an average of 10 million gallons of drinking water to residents and businesses in portions of Coventry, East Greenwich, West Greenwich, Warwick and West Warwick, Scituate and Cranston. During the summer months this amount almost doubles. Over 70 percent of this water comes from the Scituate Reservoir, purchased from Providence Water. The remaining 30 percent comes from four wells located in three separate "wellhead protection areas". These critical groundwater recharge zones are the focus of this study.

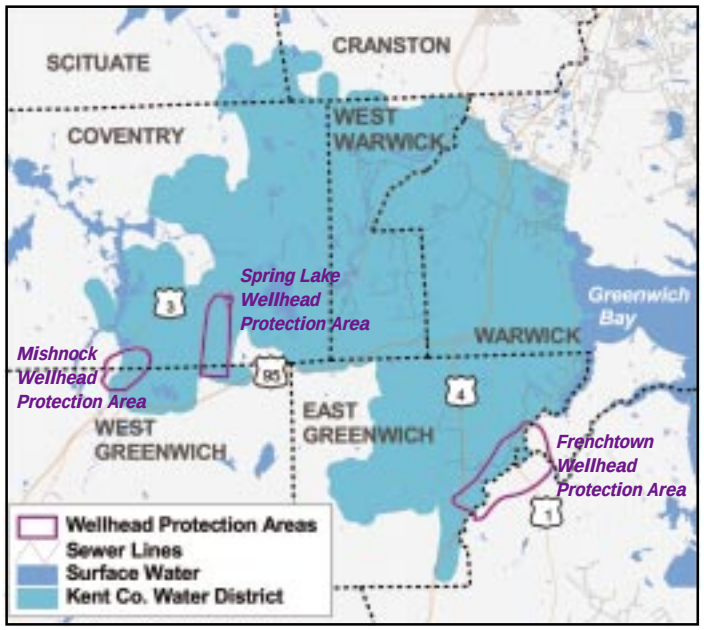
Key Findings

The Kent County Water Authority wells are located in underground aquifers where water is held in the spaces among deep sand and gravel deposits. This yields a reliable and pure source of supply but one that is highly vulnerable to contamination.

- The three wellhead protection areas are threatened by dense, unsewered residential and commercial development. Highly permeable, sandy soils provide little defense against direct movement of pollutants into groundwater.

- All wells have slightly elevated nitrogen levels – a sign that improved management of septic systems and lawn fertilizers is needed to maintain groundwater quality as growth continues. Development of zoned industrial sites in all three areas is a serious concern unless storage and use of hazardous materials is strictly controlled and wastewater properly treated.

- With wellhead areas located in five communities, regional cooperation is needed to protect these drinking water supplies. Ensuring future water quality will require implementation of zoning and development strategies to control both existing pollution sources and minimize impacts of new construction and redevelopment. Actual impacts are difficult to predict and also depend on how landowners and businesses manage their property.



Source Water

The focus of this assessment is on public drinking water supply "source" areas – the wellhead protection area that recharges a well or the watershed that drains to a surface water reservoir. Source water is untreated water from streams, lakes, reservoirs, or underground aquifers that is used to supply drinking water.

This fact sheet summarizes results of a source water assessment conducted for the Kent County Water Authority. It identifies known and potential sources of pollution in drinking water supplies and ranks their susceptibility to future contamination. The goal of this study is to help water suppliers, local officials and residents living in drinking water supply areas to take steps to keep water supplies safe.

The shoreline area is a critical water quality protection zone, helping to remove pollutants and provide wildlife habitat. Forest cover and other natural vegetation is ideal

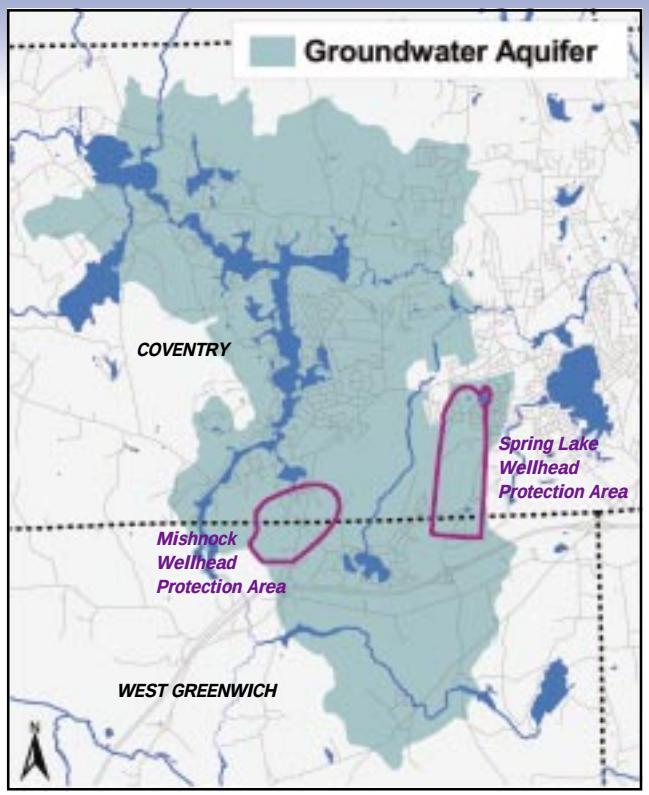
Land Use & Threats to Water Quality

To locate high-risk features most likely to affect water quality, this study evaluated and ranked each wellhead protection area based on land use and natural features. These features include the percentage of high intensity land uses, the number of sites where hazardous materials are used, and estimated nutrient sources such as septic systems and fertilizers. A rating from low to high was assigned to each factor and summed to create a pollution risk score for each study area, and an average susceptibility rank for each water supplier.

Susceptibility to Contamination

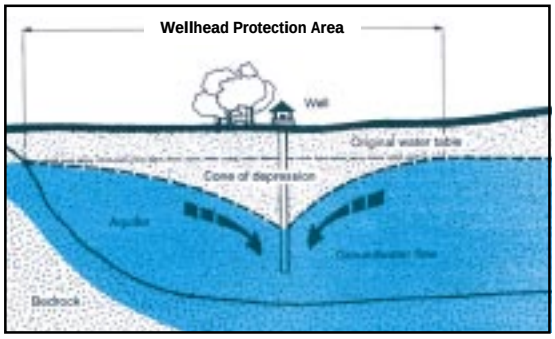
The results show that the Kent County Water Authority KCWA groundwater supply is ranked as having MODERATE susceptibility to contamination. This is an average ranking for the water supply. Individual groundwater recharge areas may be more susceptibility to contamination due to high or extreme risk from land use activities. Future risk is expected to increase with continued development.

Note: A ranking of moderate means that the water could become contaminated one day. Protection efforts are important to assure continued water quality.



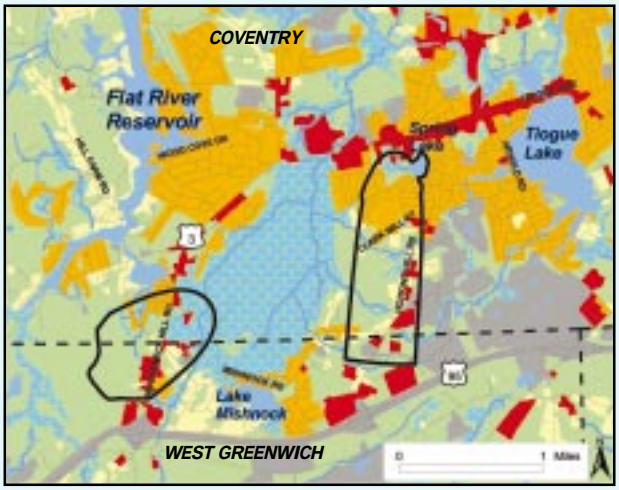
Spring Lake. The wellhead protection area for the Spring Lake wellhead protection area encompasses Spring Lake. Within the wellhead protection area, groundwater and surface water are treated as one resource.

A wellhead protection area *is the land surrounding a well where infiltrating rainwater recharges groundwater flowing to a well or cluster of wells. Within a wellhead protection area pollutants entering groundwater can easily reach a pumping well. Source: Center for the Environment, Cornell University*

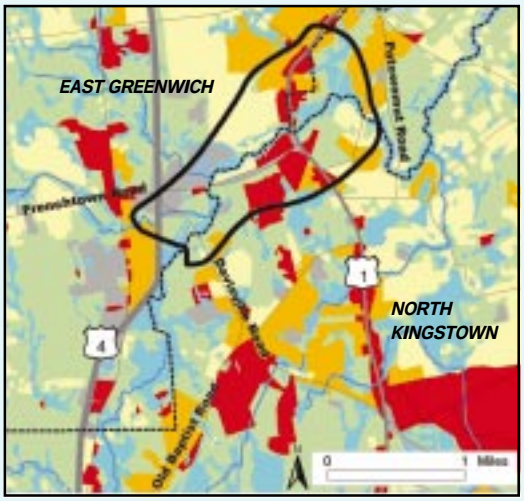


Current land use

Spring Lake and Mishnock Wellhead Protection Area



Frenchtown Wellhead Protection Area



The Mishnock Wellhead Protection Area

The wellhead protection area for the two Mishnock wells straddles the border between Coventry and West Greenwich.

- Land use activity in the area is predominantly higher density residential and commercial. Septic systems help to maintain groundwater recharge but increase the risk of groundwater contamination when improperly maintained or densely sited.

- The nearby Mishnock Swamp is likely to help maintain groundwater quality although color may be affected seasonally. This is also a State-identified unique natural habitat. Actions taken to control runoff and maintain groundwater recharge will also protect this habitat.

- Over 40 percent of the remaining 220 acres of undeveloped land in the protection area is permanently protected, including wetland areas. However, both the towns of Coventry and West Greenwich have zoned portions of the protection area for new commercial or industrial development, increasing risk of contamination unless use of hazardous materials is prohibited

The Frenchtown Wellhead Protection Area

The Frenchtown wellhead protection area is located in the Hunt River aquifer, where the boundaries of East Greenwich, North Kingstown and Warwick meet. Two North Kingstown wells and three RI Economic Development Corporation wells are also sited in this wellhead.

Similar to the Spring Lake wellhead area, the Frenchtown recharge area is at risk of spills and leaks from underground storage tanks and businesses that use or store hazardous materials. Sewers in the East Greenwich portion of the Frenchtown wellhead help reduce pollutant inputs provided that sewer lines and pump stations are checked for leaks.

Based on current zoning, an additional 25 acres of commercial or industrial development could be built in the protection area. Prohibiting use of hazardous materials, requiring advanced onsite wastewater treatment systems, and maintaining groundwater infiltration would minimize additional impacts of this growth.

With three water suppliers tapping the aquifer, there is always a need to control water withdrawals so they do not exceed the estimated safe yield for the aquifer. Since 1999 the communities and water suppliers have cooperated in regional groundwater planning, however, implementation of recommended protection measures is needed to assure protection of this resource.

Spring Lake Wellhead Protection Area

The Spring Lake wellhead protection area is located in the southeastern corner of Coventry, with a small portion of the protection area extending into West Greenwich.

- This wellhead protection area is highly developed, with 36 percent of the area in higher density residential and commercial use. This is a serious concern particularly since almost all of this intense development is also located on excessively permeable soils where pollutants can quickly seep into groundwater.

- Estimated nitrate inputs to groundwater are very high, with septic systems estimated to contribute 86 percent of the nitrogen entering groundwater. Most importantly, monitored nitrate levels are also high in this well, with maximum concentrations bordering the 5 ppm RI HEALTH advisory limit. The risk of future contamination is of concern given additional growth projected for this area.

- Close to 60 percent of the protection area is currently undeveloped but zoned for new residential, commercial and industrial uses. Large industrial facilities currently under development in Coventry increase risk of spills, leaks and improperly treated wastewater. As development continues, increased pavement and other impervious cover, already estimated to be high at 25 percent, is likely to further reduce groundwater recharge and limit dilution of groundwater pollutants. In addition, protective forest cover could drop from 32 percent to only 7 percent of the land use. Action is needed to limit the intensity of future growth and to establish development standards to control impacts.

- Use of advanced treatment systems for large commercial systems and in densely developed areas, would help maintain nitrogen loading closer to present levels while providing better treatment of bacteria and other wastewater pollutants. Requiring that stormwater runoff be treated and infiltrated would also maintain groundwater recharge volume.

Lake Mishnock. Within the larger Mishnock groundwater aquifer, actions taken to protect water supplies will also protect recreational resources and private wells. Publication photos courtesy Elizabeth Herron, URI Watershed Watch.

What You Can Do to Protect Water Quality

Protecting the long term quality of the Kent County drinking water supplies depends on the combined actions of state government, local officials responsible for balancing resource protection needs with economic development goals, in concert with homeowners, and all others who live or work in source water areas. Recommendations listed below highlight some of the most important steps each group can take.

Municipal Boards and Government

Town Planning and Land Use Ordinances

- Implementation of protection measures varies widely among the five communities that share wellhead areas. Pro-active groundwater planning, groundwater overlay zoning and development of a wastewater management program should be top priorities.
- Designate a working group to review assessment results, select priorities, and incorporate key recommendations into town plans and ordinances. Work with communities sharing aquifers. Coordinate drinking water protection with Phase 2 Stormwater Plans.
- Expand community pollution prevention education in all communities. Start by mailing this fact sheet to aquifer residents. Adopt model practices at municipal garages, schools and parks.

Hazardous Materials

- Review and update groundwater zoning as needed to prohibit new facilities using or storing hazardous materials. Require existing facilities to upgrade to state-of-the-art pollution prevention controls with expansion or redevelopment. Retrofit stormwater systems to treat runoff from gas stations, convenience stores and other high-use areas.
- Coordinate with RI DEM annually to review facility inspection results, monitoring, and compliance records. Promote employee education and voluntary participation in pollution prevention inspections.
- Prohibit disposal of “clean fill” and other construction waste in aquifer areas.

Controling Runoff and Nutrients

- Use zoning setbacks for maximum protection of public and private wells, small headwater streams and wetlands.
- Set targets for maximum impervious cover at current levels or no more than 10 percent in less developed areas. Limit site disturbance and keep runoff volume at pre-development levels. Update site design and stormwater runoff controls to treat and infiltrate runoff.
- Use conservation development to preserve permeable soils as open space for stormwater recharge.

Managing wastewater/keeping septic systems functioning

- Inspect and maintain sewers to prevent leakage and infiltration.
- Expand or adopt septic system management program to phase-out cesspools, prevent new construction in marginal sites, oversee maintenance of commercial systems, and require advanced treatment for large systems and those in critical locations.

Water Supplier

The Kent County Water Authority has an active wellhead protection program that is purely informational and includes public outreach and education, wellhead signage and monitoring. These efforts are coordinated with local governments, however, groundwater planning and protection efforts are under the direct control of each municipality.

- Implement recommendations of the latest water supply system management plan.
- Continue to acquire land for protection.
- Work with local officials to implement land use protection measures and education programs.
- Inspect water supply and protection area regularly for potential pollution sources.

Homeowners

Recycle used motor oil and dispose of other hazardous materials properly. Replace underground fuel storage tanks. Maintain or restore natural vegetation along wetlands or watercourses that run through your property. Reduce fertilizer and pesticide use. Limit outside water use. All septic systems need regular care to function properly and avoid costly repairs. Inspect annually and pump tank when needed, usually every 3-7 years. For information contact URI Home*A*Syst (401) 874-5398, www.uri.edu/ce/wq

Farmers and Landowners

Work with the USDA Natural Resource Conservation Service to develop a conservation plan that addresses proper nutrient, manure, pest, and irrigation water management. Contact them at (401) 828-1300, www.ri.nrcs.usda.gov

Commercial and Industrial Businesses

Adhere to all laws, regulations, and recommended practices for hazardous waste management, above and underground storage tanks, and wastewater discharges. Check local regulations with city/town hall and state regulations with the RI DEM Office of Water Resources (401) 222-4700, www.state.ri.us/DEM/program/benviron/water/index.htm

This assessment was conducted by the University of Rhode Island Cooperative Extension with funding from the R.I. Department of Health, Source Water Assessment Program, established under the 1996 amendments to the Federal Safe Drinking Water Act.

For More Information

- **R.I. Department of Health, Office of Drinking Water Quality,** (401) 222-6867, www.HEALTH.ri.gov/environment/dwq/Home.htm
- **URI Cooperative Extension Nonpoint Education for Municipal Officials (NEMO)** (401) 874-2138, www.uri.edu/ce/wq
- **Kent County Water Authority** (401) 821-9300

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