



# PROTECT YOUR DRINKING WATER

*Safe and healthy lives in safe and healthy communities*

## Aquidneck Island Drinking Water Assessment Results

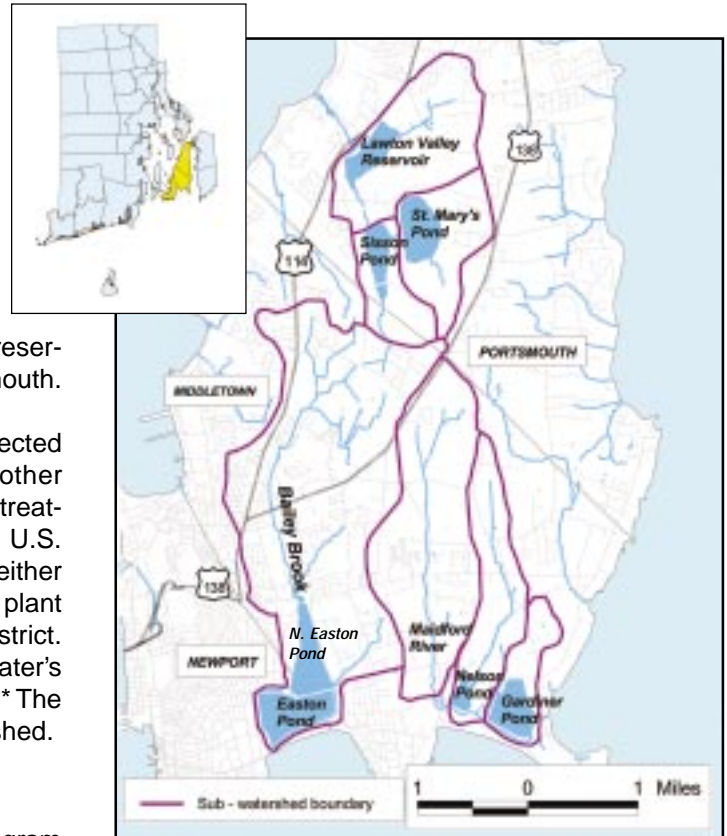
The Newport Water Division maintains a system of seven interconnected surface water reservoirs that collect and store stormwater runoff and infiltrating groundwater on Aquidneck Island. These reservoirs serve the city of Newport and about 70 percent of residents in Middletown and Portsmouth. Three quarters of the watershed – the area of land that drains to the reservoirs – is located within Middletown, with one quarter in Portsmouth.

Newport Water's distribution network consists of two interconnected systems. Water from North and South Easton Pond and other Middletown reservoirs is treated at the main Newport Water treatment facility and distributed to Newport, Middletown, and the U.S. Navy base. Water from the reservoirs located in Portsmouth is either piped to Bailey Brook or treated at the Lawton Valley treatment plant and distributed primarily by the Portsmouth Water and Fire District. This system may be supplemented seasonally by Newport Water's Nonquit and Watson Reservoirs in Tiverton and Little Compton.\* The water service district includes most of the homes in the watershed.

### Key Findings

Newport Water maintains an active watershed protection program that includes watershed monitoring, land acquisition and retrofitting storm drains to treat runoff. Yet much of the watershed is intensely developed with serious pollution risks from urban development, active agriculture, and continued suburbanization.

- Island reservoirs are showing signs of impact from watershed pollutants and low flow. Newport Water's state-of-the-art water treatment plant ensures all drinking water standards are met. However, sediment and aquatic plant matter reduces reservoir capacity and can affect taste, odor and cost of water treatment.
- Future conversion of farmland to medium density house lots, with associated runoff-borne sediment and nutrients, is expected to increase pollution risks slightly. Actual impacts are highly uncertain and depend on municipal development standards and how landowners manage their property.
- Enhanced watershed protection will reduce reliance on water treatment to meet drinking water standards while also improving aquatic habitat. Maintaining or restoring water quality will require a combination of strategies to control existing pollution sources and impacts of new construction and redevelopment.



*Aquidneck Island water supply reservoirs*

### 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 city of Newport Water Division. It identifies known and potential sources of pollution to Aquidneck Island 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.

*\* Assessment results for the Newport Water and Stone Bridge Fire District supplies in Tiverton and Little Compton are summarized in a separate fact sheet.*

# Land Use Threats to Water Quality

Within a watershed, the quality of groundwater and surface water is directly related to land use activities. To locate threats most likely to affect water quality, the seven reservoir watersheds within the Aquidneck Island water supply system were evaluated and ranked based on landscape features including: high intensity land uses, unprotected shoreline buffers, 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 an average pollution risk score for each assessment area, and an average susceptibility rank for the whole supply.

## Susceptibility to Contamination



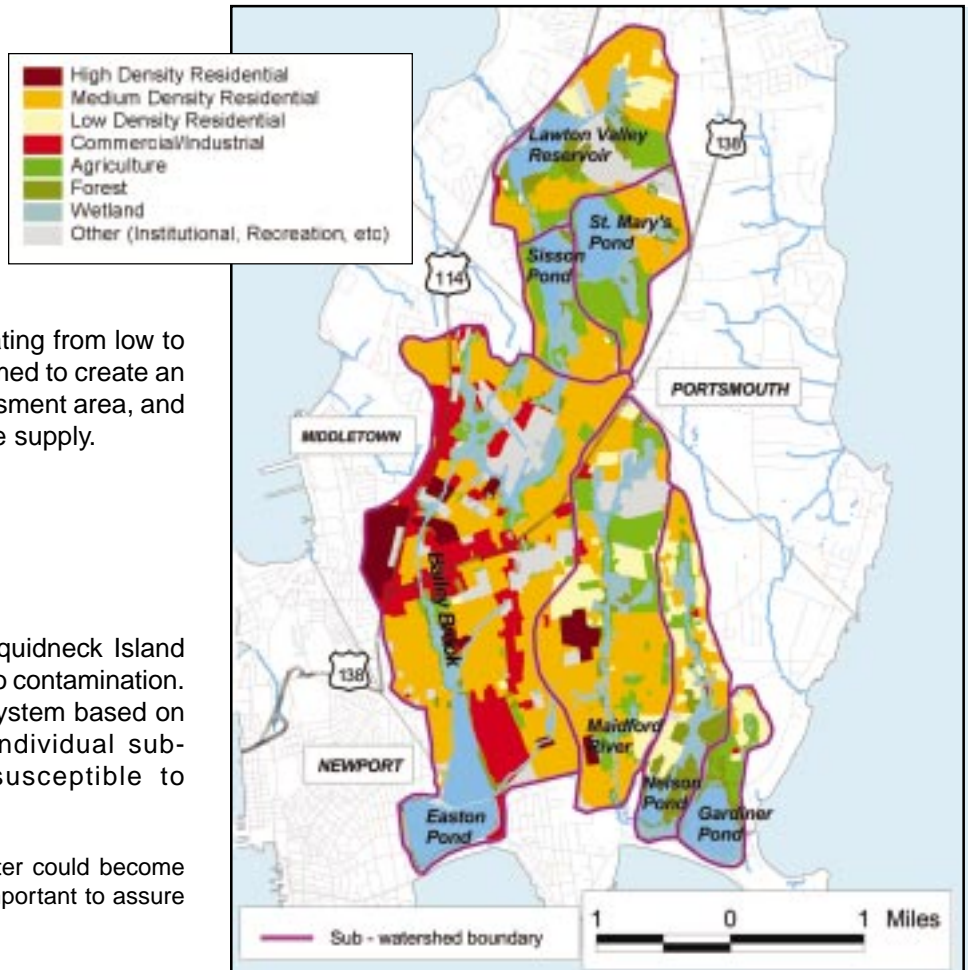
The results show that Newport Water's Aquidneck Island water supplies are moderately susceptible to contamination. This is an average ranking for the entire system based on land use and existing water quality. Individual sub-watersheds may be more or less susceptible to contamination.

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

## Current Conditions

Land use throughout the watersheds is predominantly a mix of agriculture and medium to high-density residential development. The Bailey Brook watershed, which feeds North and South Easton Ponds, is the most urban with 20 percent commercial land use. As a result, this area is at extreme risk of contamination from polluted runoff, underground storage tanks and businesses where hazardous materials may be used. Because the Bailey Brook watershed makes up 40 percent of the total watershed system, these factors increase pollution risks to the Newport Water supply overall.

- Treated water meets all drinking water standards but the RI Department of Environmental Management has ranked all water supply reservoirs and tributaries as "impaired" due to poor habitat, high bacteria, or excessive algae, at least partly due to low flow. Any additional runoff and associated pollutants with future development is a concern given existing stresses.
- Sewers in the Bailey Brook and half of the Maidford River watersheds help to reduce risk of wastewater contamination provided sewer lines and pump stations are



checked for leaks. The Portsmouth reservoirs have the highest concentration of septic systems, underscoring the need for proper septic system maintenance. Substandard systems in shoreline buffers increase the risk that nutrients and bacteria will reach surface waters, especially in high water table sites.

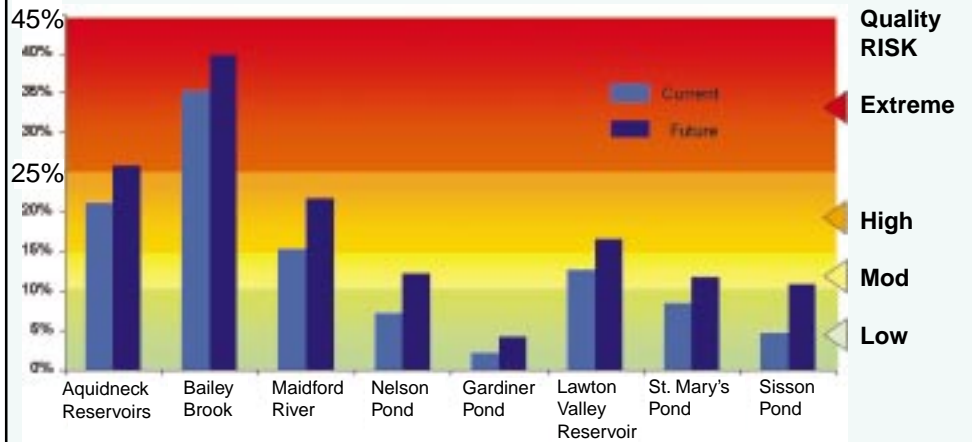
- Newport Water has protected much of the land immediately adjacent to the reservoirs, however, 50 percent of the critical shoreline buffers to surface waters and tributaries in the watersheds has been converted to business, agriculture or house lots, reducing natural treatment potential.
- Aquidneck Island owes much of its unique scenic character to its extensive farmland and nurseries, which covers almost 30 percent of the watersheds. Fertilizers and sediment from tilled cropland is potentially a high risk to water quality but actual impacts are highly variable and can be minimized with good farming practices.

## Future Threats

Under current zoning, one half of the agricultural land in the reservoir watersheds could be converted to home sites, with up to two thirds lost in the heavily agricultural Maidford River watershed.

- Pollution sources are expected to increase only slightly but runoff, lawn fertilizers, and septic systems will become more significant sources. Actual impacts are highly uncertain and may be much greater if landowners develop their properties intensively and if highly marginal sites are developed.
- Most of the remaining vacant land is wet, with water tables within 3 feet or less from the ground surface. These areas require careful design to prevent increased runoff volume. In addition, advanced wastewater treatment systems used to build on wet sites are sure to fail without routine maintenance.

## Estimated Percent Impervious Surface Area, Aquidneck Island Reservoir Watersheds



Impervious cover is a catch-all term for pavement, rooftops and other impermeable surfaces that prevent water from seeping into the ground. Many studies have linked the extent of impervious surfaces to declining habitat quality in streams and wetlands.

This chart shows that average impervious levels in Aquidneck reservoir watersheds represent a high risk to stream quality, with Bailey Brook well above the extreme risk threshold. Many watersheds are still near or below the 10 percent level considered safe for stream quality. Future development is expected to result in at least minor increases in most areas. Management options to maintain future water quality include limiting impervious cover at present levels, controlling runoff volume with new construction, and in developed areas, retrofitting stormwater systems to treat pollutants.



*The streamside zone is a critical water quality protection zone. Although forest cover is ideal, natural grass buffers also remove pollutants provided they are not fertilized or disturbed. Runoff from roads and parking lots should be treated before discharge to the buffer. Maidford River, Middletown.*



*St. Mary's Pond.*



*Constructed wetland in the Bailey Brook watershed helps treat runoff from the roads and parking lots.*

## What You Can Do to Protect Water Quality

### *Municipal Boards and Government*

Portsmouth and Middletown have adopted watershed protection measures and have a history of regional cooperation through the Aquidneck Island Planning Commission. Continued cooperation in updating plans and development standards will better protect future water quality with continued growth.

#### **Town planning and land use ordinances**

- Designate a committee to review assessment results, select priorities, and incorporate key recommendations into town plans and ordinances. Work with the Aquidneck Island Planning Commission to implement a regional water supply protection strategy.
- Continue regional open space planning to prioritize land protection immediately adjacent to water supplies and tributaries. Coordinate drinking water protection with Phase 2 Stormwater Plans.
- Expand community pollution prevention education. Start by mailing this fact sheet to watershed residents and water users. Adopt model practices at municipal garages, schools and parks.

#### **Controlling runoff and nutrients**

- Use zoning setbacks for maximum protection of 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 using state-of-the-art practices.
- Develop standards for redevelopment and infill to limit impervious cover, retrofit storm water systems and restore wetland buffers.
- Use creative development techniques to preserve farmland and open space.
- Apply strict erosion controls. Assign field inspectors in erosive sites.
- Restrict use of hazardous materials,

#### **Managing wastewater/keeping septic systems functioning**

- Inspect and maintain sewers to prevent leakage and infiltration.
- Adopt septic system management programs requiring regular inspection and maintenance. Phase out cesspools in critical areas. Restrict new alternative systems on highly marginal land.

### *Water Supplier*

- Implement recommendations of the latest water supply system management plan.
- Continue to acquire land for protection, focusing on intake areas and tributary buffers.
- Work with local officials to implement land use protection measures and education programs.
- Inspect water supply and protection area regularly for potential pollution sources.
- Expand reservoir sampling to monitor nutrient enrichment levels, track frequency and duration of algal blooms.

### *Homeowners*

Maintain wooded buffers or restore natural vegetation along wetlands or watercourses that run through your property. Reduce fertilizer and pesticide use. Limit watering. All septic systems need regular care to function properly, keep your well safe, and avoid costly repairs. Inspect annually and pump tank when needed, usually every 3-7 years. For information about protecting your well contact URI Home\*A\*Syst (401) 874-5398, [www.uri.edu/ce/wq](http://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](http://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 R.I. Department of Environmental Management, Office of Water Resources (401) 222-4700, [www.state.ri.us/DEM/programs/benviron/water/index.htm](http://www.state.ri.us/DEM/programs/benviron/water/index.htm).

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### **For More Information**

- **R.I. Department of Health, Office of Drinking Water Quality**, (401) 222-6867, [www.HEALTH.ri.gov/environment/dwq/Home.htm](http://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](http://www.uri.edu/ce/wq)
- **Newport Water** (401) 847-0154, [www.cityofnewport.com](http://www.cityofnewport.com)

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