

## NEW YORK CITY'S WATERSHED PROTECTION PLAN

To safeguard the city's drinking water, in 1997 New York City chose to launch an ambitious environmental protection plan, rather than build an expensive water filtration plant. By protecting its watershed the city would employ nature's ability to purify water while preserving open space and saving money. But as this widely heralded example of watershed protection is implemented, many question whether it will, in fact, deliver all that it promises.

For more than a century, New York City residents have enjoyed drinking water of such purity that it has been dubbed "the champagne of tap water." That water—about 1.3 billion gallons per day—flows from an upstate watershed that encompasses 1,970 mi<sup>2</sup> and three reservoir systems: the Croton, Catskill, and Delaware (NRC 1999:3, 17). Until relatively recently, undisturbed soil, trees, and wetlands provided natural filtration as the water traveled through the Catskill Mountains and the Hudson River Valley before reaching 9 million residents of the city and its suburbs. The only regular treatment needed was standard chlorination to control waterborne diseases such as cholera and typhoid.

But in the last several decades, development has brought increasing numbers of people and pollutants to the watershed, straining the land's buffering and filtering capacities. More than 30,000 on-site sewage treatment and disposal systems and 41 centralized wastewater treatment plants discharge wastewater into the upstate watersheds (NRC 1999:358). Runoff from roads, dairy farms, lawns, and golf courses contains fertilizers, herbicides, pesticides, motor oils, and road salts.

The need to attend to the development-pressured upstate watershed became clear in 1990. The U.S. Environmental Protection Agency (EPA) put New York City on notice: protect the source for the Catskill and Delaware reservoirs—the watershed, nature's own treatment plant—or construct and operate a water filtration system. Filtration would cost \$3–\$8 billion, according to various estimates, potentially doubling the average family residential water bill (Ryan 1998). By comparison, the City determined that the price tag for watershed protection would be just \$1.5 billion, increasing the average water bill of a New York City resident by about 1–2 percent, or \$7 per year (Revkin 1995, State of New York 1998).

The EPA's warning was compelled by the 1989 Surface Water Treatment Rule, which requires that surface water supplies for public water systems be filtered unless stringent public health criteria are met and extensive watershed protection strategies minimize risks to the water supply. The rising levels of bacteria and nutrients in the watershed, plus the risks posed by antiquated sewage treatment plants and failing septic systems, put New York City's Catskill and Delaware supplies in danger of violating the Rule. The Croton supplies



east of the Hudson River were in bigger trouble already: because of that area's greater pollution pressures, filtration was mandated. Even though the Croton system supplies just 10 percent of the City's water, compared to the 90 percent that flows from the Delaware and Catskill systems, the cost to build and maintain that plant is still expected to be at least \$700 million (Gratz 1999).

The cost savings from protecting the Delaware and Catskill supplies were clear, but crafting and implementing a major ecosystem protection plan is no small undertaking. Nationwide, less than 2 percent of municipalities whose drinking water systems are supplied by surface water have demonstrated to the EPA that they can avoid filtration by instituting aggressive watershed protection programs (Gratz 1999). The vast majority are far smaller than New York, less populated, and own substantially more of the critical watershed lands. When the protection agreement was crafted, New York City owned just 85,000 acres of the watershed, less than 7 percent of the total critical area, including the land beneath the reservoirs (Ryan 1998); another 20 percent was owned by the state (NRC 1999).

With so little watershed land under its direct control, but millions of water users dependent on it, New York City needed to obtain the support of upstate landowners for open-space conservation and stronger land-use protection. But from the perspective of upstate communities, watershed restrictions such as land acquisitions, limits on where roads and parking lots can be constructed, and strict standards for sewage treatment systems amounted to outsiders threatening local taxpayers' economic viability. Still, after years of

contentious negotiations, city, state, and federal officials, some environmentalists, and a coalition of upstate towns, villages, and counties forged a 1997 watershed management agreement that convinced the EPA to extend its filtration waiver until 2002.

Perhaps the most crucial element of the program is the state’s approval of New York City’s plan to spend \$250 million to acquire and preserve land in the watershed, with priority given to water-quality sensitive areas (NRC 1999:213). A local consultation process helps protect the interests of watershed communities. Other plan elements include new watershed regulations, direct city investments in upgrades to wastewater treatment plants to minimize contamination, city funding of voluntary farmer efforts to reduce runoff, and payments to upstate communities to subsidize sound environmental development (State of New York 1998).

In addition to economic savings, the ecosystem protection program offers some additional advantages that filtration cannot. It lowers health risks that are present even with filtration—for example, the risk that a sewage plant will malfunction or an incidence of the disinfectant-resistant pathogen *Cryptosporidium* will occur. Land acquisition and development controls also mean more land for parks, recreation, and wildlife habitat.

But whether this dramatic effort will prove to be a bargain remains to be seen. Among the unknowns are the effectiveness of voluntary pollution protection commitments by farmers, and still-evolving knowledge of best management practices to control roadway, lawn, farm, and other runoff. Environmental organizations are concerned that the negotiated settlement contains serious loopholes in the watershed rules and land-buying requirements. For example, the agreement provides no limits on the number of new sewage treatment plants that can be built in the City’s cleanest reservoir basins.

Nor does the agreement specify an absolute acreage requirement that the city must purchase in the watershed, only that the city must *solicit* the purchase of 350,000 acres. The City projects that this approach could lead to its acquisition of about 120,000 acres, allowing it to increase its holdings to 17 percent of the critical land area in the next 10 years (Gratz 1999). However, the City’s solicitation efforts might yield far less land, since the plan relies on the cooperation of upstate residents—and even 17 percent ownership gives the City limited watershed control. Another problem is that the plan sets criteria for types of land to be acquired but no assurance that the “best” lands from the perspective of water quality will be purchased, since land is obtained on a willing buyer/seller basis. From the perspective of the Natural Resources Defense Council, the plan may allow too much development to take place on sensitive watershed lands and the scientific aspects of water management were given insufficient attention by negotiators under pressure to craft a politically acceptable plan (Izeman 1999, Revkin 1997). Other concerns include inadequate requirements for buffers—zones of vegetation where discharge of pollutants, and development, cannot take place (NRC 1999:14)—and the agreement’s failure to emphasize pollution prevention as much as pollution control.

Only years of extensive water quality monitoring will prove whether the watershed protection program is sufficient to protect public health. At the moment, the water is still deemed safe to drink, but some still think filtration ultimately will be required.

Shortcomings aside, the agreement is laudable. It formally acknowledges the interests of watershed residents and stresses the need to implement watershed protection plans fairly and equitably. Elements of the New York City watershed agreement may serve as a model for other communities. There is a growing recognition that filtration, by itself, is no panacea. It can reduce the threat of waterborne pathogens, but it cannot completely eliminate the threat, especially if the source water is poor. Watershed protection offers a cost-effective approach to clean drinking water, and benefits the environment as a whole. The challenge in the case of New York City is the need to compel many people and communities to work together, putting aside self-interest, toward the twin goals of saving the watershed and saving money.

### Ownership of Critical Watersheds

Only a handful of major U.S. cities have unfiltered water supply systems—mostly those that can ensure long-term water protection because significant portions of the critical watershed lands are owned by the water utility or are designated as protected open space under state or federal ownership and management. New York City is an exception—and accordingly, it must rely heavily on the cooperation of private upstate landowners to help protect its drinking water.

City	Ownership (percent)		Watershed Area (acres)	Population Served (millions)
	Public	Private		
Seattle, WA	100	0	103,885	1.2
Portland, OR	100	0	65,280	0.8
New York, NY	26	74	1,279,995	9.0
Boston, MA	52	48	228,100	2.4
San Francisco, CA	100	0	475,000 <sup>a</sup>	2.3

<sup>a</sup>Supplies 85 percent of the city’s water; 15 percent is filtered and comes from other publicly owned watersheds.

Sources: NRC 1999; personal communications.