RECENT DEVELOPEMENTS IN MASSACHUSETTS GROUNDWATER LAW

Rutherford H. Platt and Peter B. Klejna
Land and Water Policy Center, Department of Geography
University of Massachusetts

Introduction

Groundwater is a plentiful and widely distributed resource in Massachusetts. Usable aquifers occur in glacial stratified drift and till deposits, as well as in sedimentary, crystalline, and carbonate bedrock formations. Most public water supplies are derived from stratified drift aquifers that comprise the sole source of water for Cape Cod, Nantucket, and Martha's Vineyard, and an important supplement to surface sources in many towns and cities elsewhere in the state. Altogether, about two million Massachusetts residents (one-third of the 1990 state population) rely upon groundwater for part or all of their water supplies. Many commercial and industrial activities also depend upon groundwater.

Until the past decade, however, groundwater in Massachusetts was managed haphazardly if at all. The state has long followed the common law doctrine that the owner of the surface owns "absolutely" the underlying groundwater and may pump without limit even to the detriment of other well owners affected by the resulting cone of depression. Similarly, pollution of groundwater was not regulated, other than intentional "well poisoning" and victims of industrial contamination or leaking storage tanks were left to inefficient and unpredictable common law remedies.

Recognition of the need for state groundwater management was belated in Massachusetts for several reasons. First, groundwater as a physical resource was less understood than surface water in terms of its hydrogeology, the delineation of groundwater basins and recharge areas, the attenuation of pollutants in aquifers, and the estimation of safe yields. In short, the physical measurement and assessment of groundwater resources is expensive, inexact, and relatively subjective as compared with surface waters.

Second, much of the Greater region – about 2.4 million people – is served by the metropolitan water system administered by the Massachusetts Water Resources Authority and the Metropolitan District Commission (MDC). This system which originated in 1895 relies exclusively on upland surface waters draining into the state's two major reservoirs, Quabbin and Wachusett. The 46 cities and towns served entirely or partially by this system, which include the hometowns of many of the state's governmental officials, have been lulled by the availability of cheap, high quality water from the MDC system into neglecting their local groundwater supplies. Many of the latter have been grossly polluted.

Third, the variety of potential threats to groundwater was not fully appreciated until recently. According to Kaynor (1988), six principal classes of groundwater pollutants in order of decreasing severity are: 1) leaking gasoline storage tanks; 2) waste oil and degreasing compounds; 3) road salt; 4) leachate from landfills and hazardous waste disposal sites; 5) incomplete treatment of waste water, particularly from clusters of septic systems in unsewered areas, and 6) pesticides and the herbicides applied to lawns, golf courses, and public rights of way. The effects of most of these are experienced locally and in the absence of monitoring of public and private water supplies may be undetected for long periods of time. Thus the cumulative impact of such localized and poorly documented pollution incidents upon the state's groundwater resources has long been underrecognized. Since 1960, over 100 public

wells in Massachusetts have been closed due to contamination, comprising about 7 percent of the 1,400 public wells in the state.

Fourth, the qualitative implications of the lack of quantitative groundwater management were long ignored. Thus heavy pumping from aquifers containing localized "pockets" of contaminates will cause those substances to migrate toward the points of withdrawal more rapidly than if pumping rates were lower. Two examples of contaminate plumes being artificially expedited by intense pumping "downstream" have occurred in Falmouth on Cape Cod and in the Barnes Aquifer System in the Connecticut River Valley.

Fifth, the health effects of groundwater contamination were little documented or recognized until the shocking revelations of the late 1970s of outbreaks of cancer and birth defects at Love Canal in Buffalo, New York, Woburn, Massachusetts and many other sites of industrial toxic waste disposal in or near groundwater aquifers.

Recent Legal Enactments

Since 1979, Massachusetts in tandem with the federal government has begun to focus state-level attention upon its groundwater resources. Some of the major statutory results of this heightened perception have included:

- The Massachusetts Hazardous Waste Management Act of 1979, Mass. General Laws Annotated (MGLA) Ch. 21 C regulates the transportation, storage, treatment, and disposal of hazardous wastes, including the restriction of hazardous waste facilities near drinking water supplies, either surface or ground. This act parallels the Federal Resource Conservation and Recovery Act of 1976 (RCRA).

- The Massachusetts Hazardous Waste Facility Siting Act of 1980, MGLA, Ch. 2 1D established a Hazardous Waste Siting Council with authority to review and approve applications for new or expanded hazardous materials disposal sites. (To date, no such sites have been established anywhere in Massachusetts since this act was adopted.)

- The Aquifer Land Acquisition Program, MGLA, Ch. 111, sec. 160, adopted in 1982, authorizes state funding to assist local governments in the acquisition of land or easements in recharge areas critical to their groundwater supplies. To be eligible for funding, municipalities must develop and implement a water conservation program pursuant to state guidelines. By 1984, 27 projects were approved statewide for an authorized total cost of $10 million. Another ten projects were approved in a second round of grants totaling $4.25 million. Some projects have not yet been completed and the state's current budget deficit imperils further activity under the program.

- Under the same legislative authority, the state's Department of Environmental Quality Engineering (now Department of Environmental Protection) in 1982 issued Underground Water Source Protection Regulations (310 CMR 27.00). The injection of hazardous wastes into underground formations was prohibited.

- The Massachusetts Water Management Act of 1985, MGLA Ch. 2 1G established the institutional framework for comprehensive management of existing and new surface and groundwater withdrawals exceeding 100,000 gallons

per day. Public and private water suppliers must furnish annual registration statements identifying the use, source, and amount of withdrawal, conservation measures in effect or to be instituted, and the point of discharge after use.

- A bill (HY 1380) currently in the legislature (as of March, 1991) is proposed to regulate land uses in the nonpublic portions of the three primary MDC watersheds (Quabbin, Wachusett, and Ware River). The bill, if adopted, would apply to land within 400 feet of reservoirs or their tributaries, within 100 feet from 100-year floodplains in such water sheds, or 100 feet from wells yielding more than 100 gpm. In such areas, it would prohibit the disposal and/or storage of hazardous materials, wastewater, liquid petroleum products, solid wastes, salt and agricultural chemicals. It would ban development within 200 feet of a tributary to a reservoir and would regulate development within 400 feet. Preexisting uses however would be grandfathered. The bill was adopted by one house in 1990 and enactment in the current session is expected.

Intergovernmental Cooperation

With the active assistance of the area's regional planning body, the Pioneer Valley Planning Commission (PVPC), all four towns during the 1980s commissioned studies of their portions of the Barnes system and adopted protective land use measures. But it has become increasingly evident that each municipality is at the mercy of its neighbors to vigilantly police existing and future sources of potential contamination to the common aquifer. Massachusetts zoning law provides for notice to adjoining towns of proposed zoning changes, but many other municipal actions affecting the aquifer do not require consideration of the interests of abutting jurisdictions, e.g. the issuance of building permits not involving a zoning change.

The adoption of state laws and regulations do not *ipso facto* produce improvement in the management of a complex resource such as groundwater. State and federal laws must be matched by local initiatives in the form of zoning, land acquisition, subdivision review, and other measures to yield effective protection of specific water sources. Furthermore, since aquifers usually underlie more than a single unit of municipal jurisdiction, intercommunity coordination is required. A case in point is the Barnes Aquifer near the Connecticut River in central Massachusetts where an intermunicipal management approach has recently been established.

The Barnes Aquifer System is a complex of several productive aquifers extending about twelve square miles beneath portions of four municipalities (Motts, 1985). (There is no unincorporated land in Massachusetts; all land lies within a town or city.) The system provides drinking water to about 60,000 people in the towns of Easthampton and Southampton, and in the cities of Westfield and Holyoke. It is the sole source of water for the 16,000 residents of Easthampton. The aquifers lie in unconsolidated sedioments of glacial and postglacial origin and are therefore highly vulnerable to contamination. Two of Easthampton's wells have been shut down due to a plume of trichloroethylene (TCE), a cleaning solvent that was first detected in 1984.

Pursuant to months of discussion, the four municipalities and the PVPC in December, 1989 entered into a Barnes Aquifer Protection Memorandum of Agreement. This agreement establishes a permanent Barnes Aquifer Protection Advisory Committee (BAPAC).

The committee is not a new layer of government and has only advisory powers. However it may accept funds and contract for studies or services. Each member municipality and the PVPC have one vote apiece. There are three designated representatives from each municipality representing 1) the board of health or water commission, 2) the conservation commission, and 3) the planning board. PVPC is represented by its executive-director or designee.

The principal function of the committee is to review and comment upon proposed development and land uses potentially affecting the Barnes Aquifer System. It is further constituted to "develop and promote coordinated, uniform plans, programs, techniques and suggested municipal bylaws for growth management, land use and development review, and resource protection for all member municipalities." (For further information contact: Timothy W. Brennan, Executive Director, PVPC, 26 Central Street, West Springfield, MA 01089 (413)781-5045.

References

Kaynor, E.R. 1988. Municipal Groundwater Containingtion in Massachusetts: The Case for Wellhead Protection in Humid Regions, Pub No. 158. Amherst, MA: University of Massachusetts Water Resources Research Center.

Motts, W.S. 1985. Hydrogeology of West Holyoke and Adjacent Areas. Amherst, MA: Mimeo.