

WATER RESOURCE ADVISORY COMMITTEE

Final Report

May 2025



TOWN OF
DEDHAM
MASSACHUSETTS

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Overview

The Town of Dedham Water Resource Advisory Committee (WRAC) was established by the Select Board in 2024 to gain a better understanding of the policies and practices affecting the Town's drinking water. The committee was charged with assessing the need for additional studies and identifying opportunities to ensure the sustainability of the Town's drinking water resources and reporting those findings to the Select Board.

The Select Board defined the primary objectives for the WRAC as:

- To gain a better understanding of future water demand, capacity, and quality in Dedham and the surrounding region;
- To assess the need for additional studies, including defining potential budgetary considerations and setting objectives for possible further research;
- To identify possible opportunities to ensure that current planning and development policies and practices are sustainable for future drinking water quality and supply.



Sign in front of Town Hall in Dedham, Mass. (Source: Town of Dedham)

To accomplish these objectives, nine members of various expertise were assembled. Two members at large were appointed by the Select Board (one member with general interest in the Town’s water supply and one with professional experience in water), five were designated as representatives from other boards, and two members served in Ex-Officio roles. The members of the WRAC were:

Name	Role	Credentials
Nathan Gauthier	Member	Conservation Commision Member
Shaw McDermott, J.D.	Member	Select Board Appointee
James O’Brien	Member	Planning Board Member
Kelsey Pieper, Ph.D.	Member	Select Board Appointee
Jessica Porter	Chair	Planning Board Member
Dimitria Sullivan	Vice Chair	Select Board Member
Dennis Teehan, Jr., M.D	Member	Select Board Member
Meredith LaBelle	Ex-Officio	Conservation Agent, Town of Dedham
Blake Lukis	Ex-Officio	Executive Director, Dedham-Westwood Water Department

Additionally, Jeremy Rosenberger (Director, Town of Dedham Planning, Zoning, and Natural Resources Department), Patrick Hogan (Stormwater Manager, Town of Dedham), Leonel Lainez (Environmental Specialist, Town of Dedham), and Rana Mana-Doerfer (Assistant Finance Director/Director of Grants and Procurement, Town of Dedham) provided staff assistance to the committee.

The WRAC was tasked with conducting thorough research on which to base its findings and identify potential actions to be taken by Town bodies.

WRAC Process

At the formation of the committee, the following key research activities were planned:

- Evaluate the initiatives, programs, and research available from the Commonwealth relating to state water resources and sustainability to avoid duplicating efforts already achieved;
- Evaluate existing data and studies on drinking water quality and supply locally in Dedham and surrounding communities;
- Conduct interviews with local agencies (e.g. the Dedham-Westwood Water District, Charles River Watershed Association, Neponset River Watershed Association, and the Southeast New England Program Network);
- Collaborate with relevant stakeholders, including the Board of Health, Sustainability Advisory Committee, and the Departments of Engineering and Public Works to gather insights on water demands, quality issues, potential risks, and available resources.

Once assembled, the members of the WRAC committed to a monthly meeting schedule where they would solicit information from knowledgeable sources as well as share information gathered from each member's own individual research to generate discussion on potential actions that could result from the committee's process. They assembled a framework to guide their work and ensure a final report could be provided to the Select Board within one year. The following table is a summary of meeting dates and topics.



Group meeting at conference room table (Stock Image)

The WRAC held a total of eleven (11) public meetings from June 2024 to May 2025. All meetings were open to the public.

Meeting Date	Meeting Topics and/or Presenters
June 11, 2024	Review of tasks and agreement on framework for fulfilling the Committee's responsibilities
July 9, 2024	Presentation from the Dedham-Westwood Water District on processes and procedures
August 20, 2024	Presentations from the Town of Dedham's Director of Engineering and Stormwater Manager on roles and responsibilities as they relate to groundwater
September 30, 2024	Presentation from committee member Kelsey Pieper (drinking water educator) on background related to drinking water supply and production
October 15, 2024	Presentations from the Charles River Watershed Association and the Neponset River Watershed Association containing their recommendations for water sustainability
November 19, 2024	Presentation from the Town of Dedham's Public Works Director and Conservation Agent on roles and responsibilities as they related to groundwater
January 21, 2025	Review & Discussion of Draft Report
February 24, 2025	Review & Discussion of Draft Report
March 31, 2025	Review & Discussion of Draft Report
April 14, 2025	Review & Discussion of Draft Report
May 12, 2025	Committee approval of Final Report & Submission to Select Board

Dedham's Water Supply

The Dedham-Westwood Water District (DWWD) supplies both Dedham and Westwood with drinking water. DWWD primarily obtains water from wells that access groundwater. Groundwater is water that is present below the earth's surface in saturated sand and gravel pore spaces, also known as aquifers (see Figure 1). The EPA has designated all of DWWD's wells as "not under the direct influence of surface water."

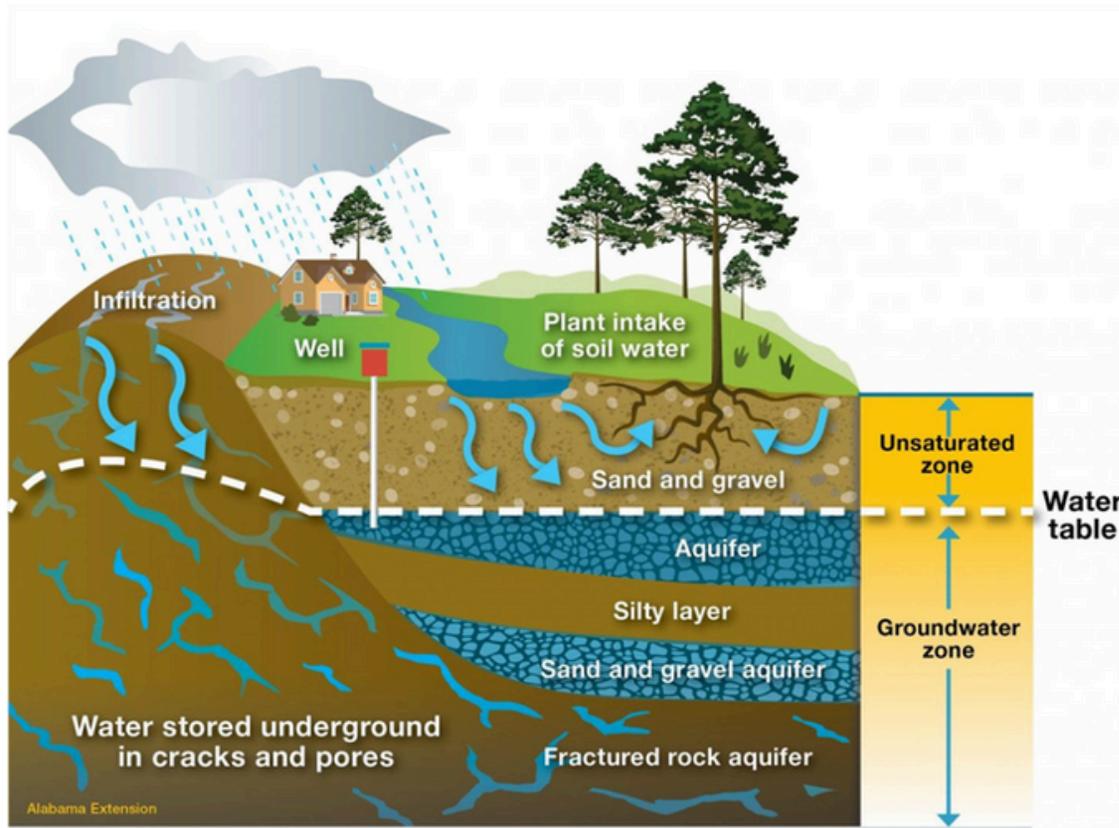


Figure 1: Groundwater water system diagram (Source: www.aces.edu/blog/topics/fish-water/what-is-an-aquifer/)

It is important to note that the groundwater aquifer accessed by DWWD is replenished by regional precipitation and infiltration, not just from infiltration within the Town of Dedham and Town of Westwood. DWWD supplements this supply with purchased water from the Massachusetts Water Resources Authority (MWRA) which provides surface water from the Quabbin Reservoir. Surface water is water that collects on the Earth's surface in streams, rivers, lakes, wetlands, and oceans, which is visible and directly accessible from above ground.



Some residences and businesses in Dedham also maintain their own private wells. These private wells are typically used for irrigation. These irrigation wells access the same aquifer as DWWD's wells and therefore draw from the same groundwater supply. Privately owned wells are not subject to the same use restrictions or water quality standards as are applied to the public water supply.

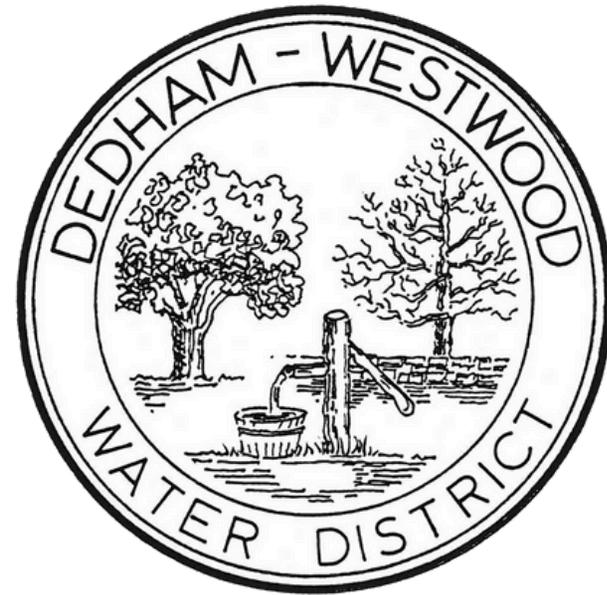
Lawn irrigation system (*Stock photo*)

About Dedham-Westwood Water District (DWWD)

The Dedham-Westwood Water District (DWWD) is a self-supporting independent branch of local government responsible for providing drinking water and fire suppression to the towns of Dedham and Westwood. The origins of DWWD stretch dates back to 1876 and today serves a population of about approximately 14,000 customers at residential and businesses locations through 208 miles of water mains. DWWD is a separate entity from the two towns it serves (the Towns of Dedham and Westwood). DWWD is governed by a six-member Board of Commissioners, three of which are appointed by the Dedham Select Board.

For more information on DWWD, Appendix A provides a variety of information, in addition, visit DWWD's website: www.dwwd.org.

An organizational chart for DWWD and associated Town departments, boards, and committees is included in Appendix B.



Dedham Westwood Water District Seal (Source: Dwwd.org)

Through ten (10) public meetings of WRAC, interviews with a variety of subject matter experts, as well as research by committee members, the Committee has made the following findings for each of the three WRAC objectives.

Objective 1: Understanding future water demand, capacity (supply), and quality in Dedham and the surrounding region.

The Committee has found that the Town of Dedham, based on evidence presented by DWWD, has the necessary predicted drinking water supply to handle future growth and associated water demand. Specifically, the Committee finds that DWWD has adequate capacity, both through the treatment of groundwater supply and purchase of MWRA water, to address the water demand associated with future development in the Town.



Charles River (Town of Dedham)

The following graphic illustrates DWWD current and maximum water capacity through 2040. Figure 3 shows the average daily demand, which describes the average amount of water used per day by customers in the Towns of Dedham and Westwood (approximately 4 million gallons per day [MGD] but projected to increase to 5.5 MGD by 2040). The maximum average daily demand for DWWD is 6.57 MGD. The projections will next be evaluated in approximately 2030 to review and estimate future average daily demand.

AVERAGE DAILY DEMAND (ADD)

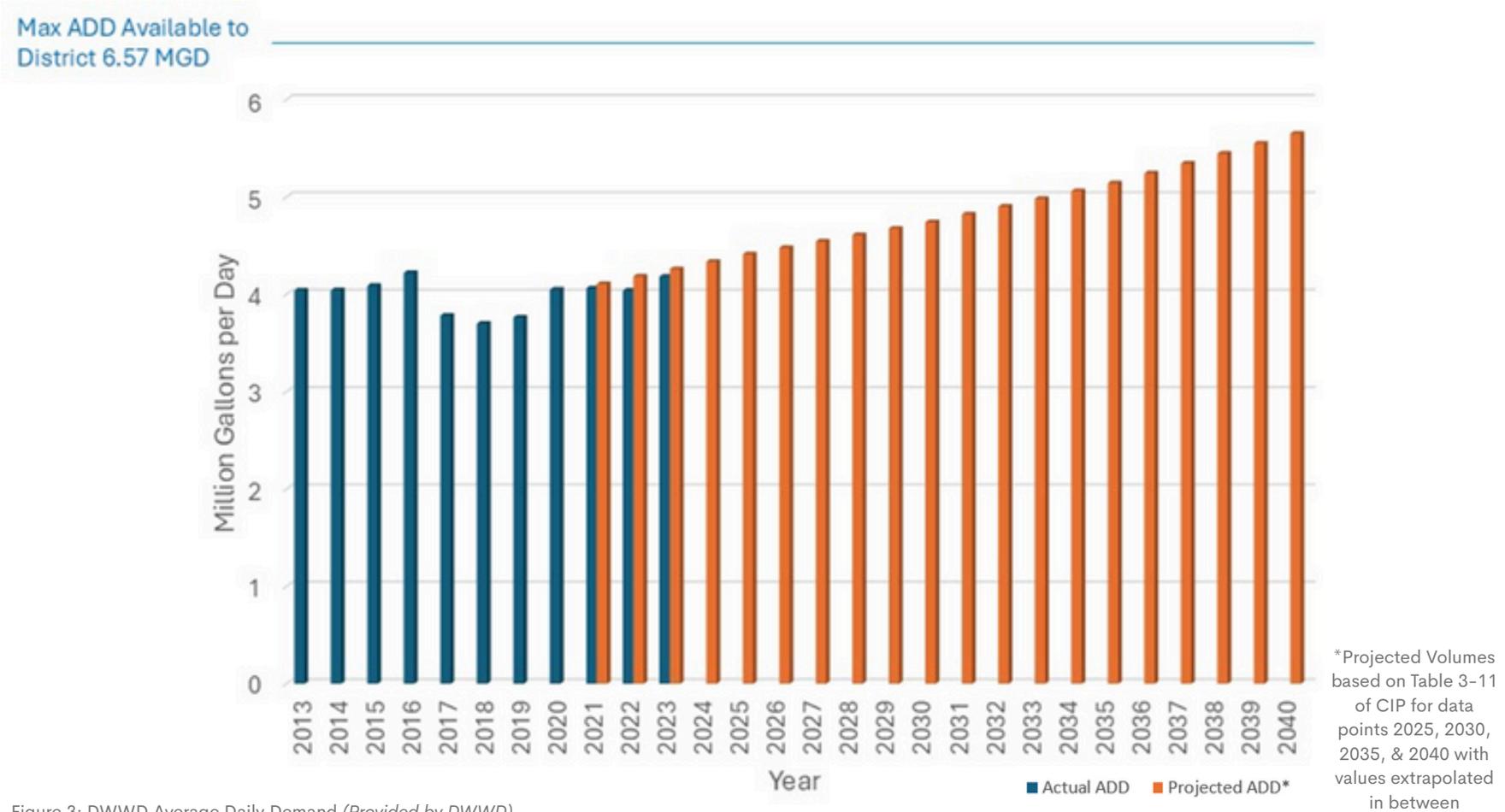


Figure 3: DWWD Average Daily Demand (Provided by DWWD)

The average daily demand fluctuates throughout the year. DWWD reported that, primarily due to lawn irrigation, water use between June and September (the high demand season) is on average 25% higher than between October and May (the low-demand season). This 25% increase in water use over the 4-month period equates to 8% of the total annual volume of water (on average).

DWWD utilizes two metered interconnections with the MWRA system to supplement the water pumped from DWWD’s wells. In the past 4 years, DWWD acquired an average of 0.5 MGD through these connections, primarily during the summer months or when local sources are offline for maintenance. MWRA water has also been used more frequently since the Fall of 2021 to help reduce the levels of total trihalomethane (a disinfection byproduct regulated by the EPA) in the distribution system. The following graphic shows the overall volume of water provided and the source breakdown between MWRA and DWWD’s wells.

DISTRICT SOURCES VS MWRA TOTAL WATER PUMPED

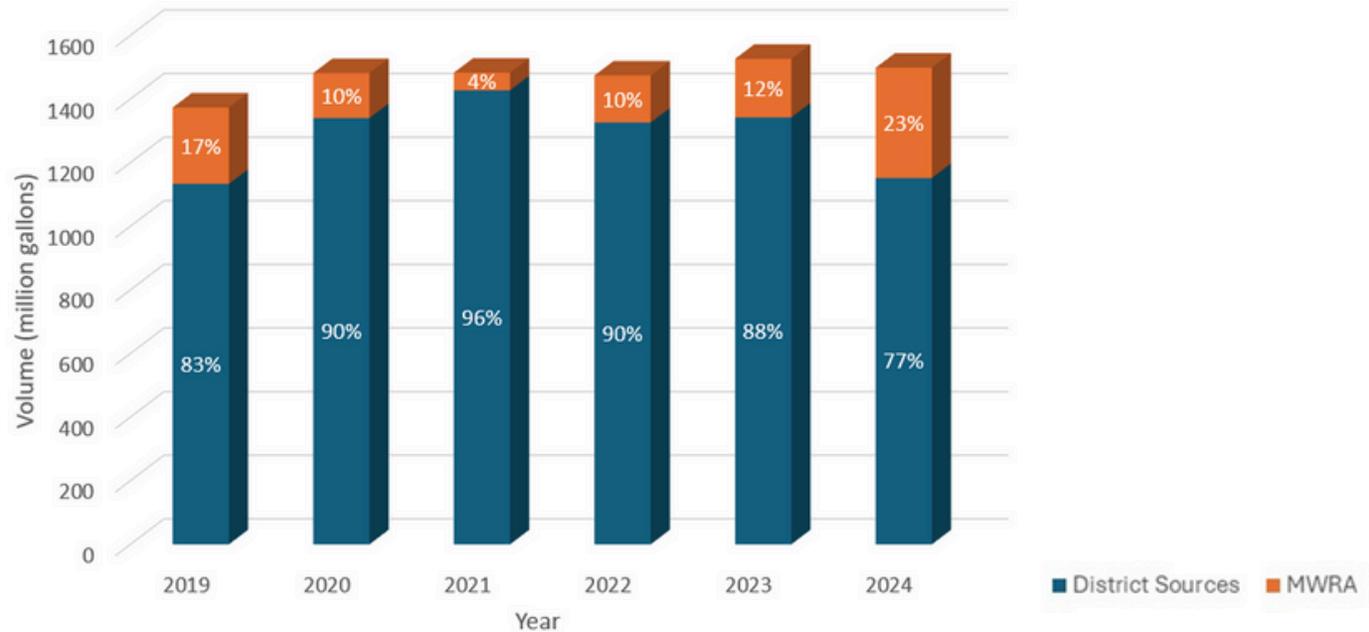


Figure 4: DWWD District Sources Chart (Provided by DWWD)

To encourage water conservation, DWWD leads many efforts to increase the public's awareness of water use and help them find strategies to use less water. These efforts include: offering discounts on rain barrels, providing rebates for water conserving fixtures and appliances, performing outreach to school classrooms, offering in-home leak detection kits, and staffing informational booths at both Dedham Day and Westwood Day.

DWWD manages the drinking water treatment plants according to state and federal regulations and regularly performs inspections of all wells and pumping stations. To ensure the drinking water meets the required standards, samples are collected and tested for various parameters. Some water quality characteristics such as pH, chlorine, iron, manganese, phosphate, turbidity, and fluoride are assessed daily. Testing is performed for total coliform bacteria weekly and other contaminants, such as PFAS, lead, copper, disinfection byproducts, volatile organic compounds, and synthetic organic contaminants are checked according to MassDEP guidelines and regulations. Additionally, testing for sodium and chloride are not required by MassDEP but are analyzed by DWWD and included in the consumer reports.

DWWD produces and shares a water quality report every year (available at www.dwwd.org/waterquality). The most recent Annual Water Quality Report shows that DWWD was in compliance with all required regulatory thresholds established to protect the public health as well as voluntary secondary thresholds intended to improve the aesthetics of drinking water.



DWWD Water Sampling (Provided by DWWD)

Objective 2: Assess the need for additional studies, including defining potential budgetary considerations and setting objectives for possible further research.

During the WRAC's initial information gathering phase, the Committee heard from many stakeholders associated with the Town's drinking water supply. During that process, other potential information sources were identified but were unable to be included in the initial phase. Those parties are identified below as additional potential resources as this issue continues to be researched and the potential actions within this report are considered for implementation.

1. Input from the MWRA as a partial supplier of Dedham drinking water may be beneficial in the future.
2. The Committee recognizes that it would be valuable to receive input from end users, such as developers and property owners, when implementing any of the potential action items.

No additional studies are recommended to be funded by the Town of Dedham to address the demand, supply, and quality of Dedham's drinking water. However, the Committee does recommend the following continued efforts:

- Pursue any potential grants regarding water conservation, stormwater infrastructure, and soil conditions;
- Engage with MWRA and other local utilities to understand studies that these utilities have conducted to learn from their efforts; and
- Participation with regional communities and non-profits to ensure Dedham's drinking water is a viable source of drinking water for decades to come.

Objective 3: Identify possible opportunities to ensure that current planning and development policies and practices are sustainable for future drinking water quality and supply.

The WRAC has reviewed various aspects of Dedham's drinking water supply and identified actions that could be taken by various boards, committees or departments to support the continued quality and quantity of the Town's drinking water. Note these are focused on actions at the Town level and are additive to existing and future efforts of the Dedham Westwood Water District.

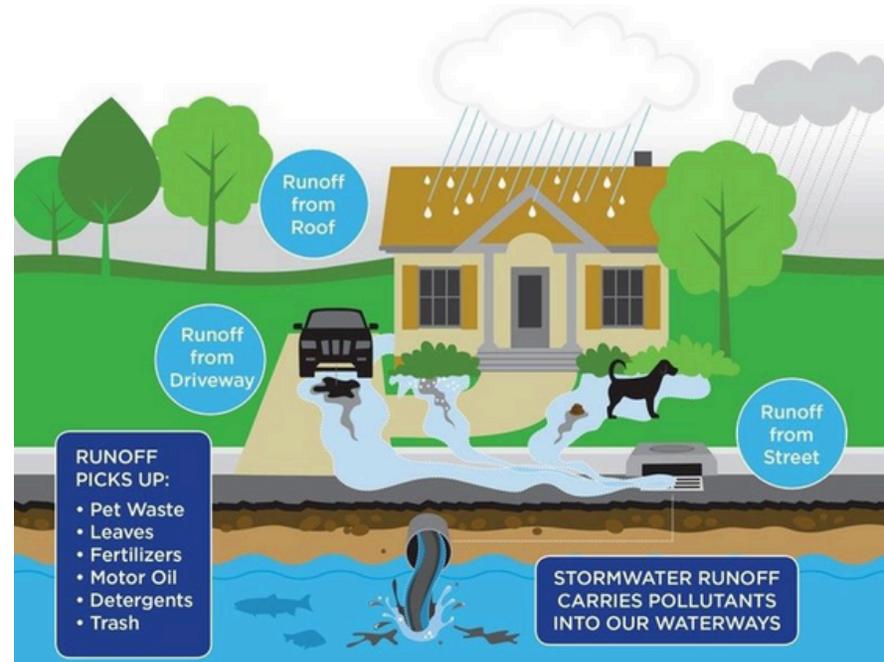


DWWD Hydrant flushing (Provided by DWWD)

Connection Between Stormwater Management and Drinking Water

Effective stormwater management plays a role in supporting groundwater resources, both locally and regionally. Stormwater is water that runs off of surfaces (such as parking lots, roofs, driveways, and saturated soil) during precipitation events. Without stormwater control measures (SCMs), this water typically flows off the site and discharges to the nearest waterway or wetland. SCMs such as rain gardens, bioswales, and permeable pavements can be introduced on a site to collect stormwater and, in many cases, infiltrate it into the ground, contributing to the groundwater supply. Reducing impervious surfaces will also generate less stormwater runoff by allowing more natural infiltration of precipitation into the soil.

As stormwater filters into the ground, it passes through layers of soil and rock, which can act as natural filters to remove some pollutants. These pollutants include total suspended solids (TSS), particulate phosphorus, heavy metals like copper and zinc, and bacteria. This process can help maintain the quantity and quality of groundwater. Without effective management, stormwater flows directly to the nearest surface water or wetland along with the pollutants it carries, impacting the health of our local waterways.



Stormwater Runoff Overview (Richmond, Virginia)

Bylaws Related to Groundwater

Currently, the Town of Dedham, through the Stormwater Bylaw, requires qualifying new development and redevelopment projects to implement SCM's that often greatly improve the existing stormwater conditions on a site. Many properties were developed prior to the Stormwater Bylaw being established, but as they are redeveloped, application of the bylaw and associated stormwater management standards can lead to a significant improvement in both the quantity and quality of the site's runoff. Further, the Engineering Department plans and oversees projects to improve stormwater management within the Town's stormwater system and has regularly pursued grant funding to aid in flood mitigation, such as through the Massachusetts Executive Office of Energy and Environmental Affairs' Municipal Vulnerability Preparedness program. The Town of Dedham is also currently assembling and considering additional options for actions to mitigate the future flooding that is projected as a result of changing environmental conditions.

While mainly directed at improving surface water quality, Dedham's Stormwater Management Bylaw and associated Stormwater Management Rules & Regulations also indirectly support the groundwater supply by encouraging effective management of runoff on new development and redevelopment sites.

The Engineering Department also actively pursues similar stormwater improvements on public property and in rights-of-way. Stormwater control measures installed as part of these efforts often seek to infiltrate runoff, which helps to remove pollutants and reduce the strain on the stormwater system but includes the added benefit of replenishing the groundwater supply.



Example of stormwater vegetated swale (<https://princetonhydro.com/nj-stormwater-regulations-2020/>)

Furthermore, Dedham's Wetlands Bylaw and Rules & Regulations contribute to the preservation of the town's groundwater resources by safeguarding surface water and restricting development in areas directly adjacent to wetlands and water bodies. The protection of both private and public water supplies is recognized as one of the eight primary interests under the Massachusetts Wetlands Protection Act, as wetlands function as natural filtration systems and recharge zones for groundwater. The Dedham Conservation Commission is committed to protecting these important areas, while also promoting public awareness regarding the significance of these habitats.

Lastly, the Zoning Bylaw provides regulations for areas surrounding DWWD's wellheads through the Aquifer Protection Overlay District (APOD). The purpose of the APOD is to protect the town's water resources by preserving and maintaining the quality and volume of existing and potential groundwater supply and ground water recharge areas within the town. Within the APOD uses that could be detrimental to the Town's water resources, such as storage of hazardous waste, landfills, junkyards, and production of potential hazardous materials are forbidden. In addition, impervious coverage is regulated to encourage aquifer recharge.



Little Wigwam Pond (Source: Town of Dedham)

Potential strategies have been grouped according to the following categories:

1.

Education & Governance – Actions that strengthen the inter- and intra-town coordination and communication about challenges and opportunities for protecting Dedham and regional water supply.

2.

Water Conservation – Actions that address the ongoing reliability of Dedham’s primary water source.

3.

Stormwater – Actions that address potential issues with infrastructure and delivering drinking water to residents after treatment.

4.

Water Quality – Actions that continue reduction of drinking water concern.

5.

Items Indirectly Related to Water Supply & Quality – Actions that are only peripherally related to the WRAC’s scope but would generally benefit the environment and potentially provide a secondary benefit to drinking water.

Topic	Action	Reason	Board/Committee/Department
Education & Governance			
	1. Educate decision-making boards.	Increase education regarding environmental issues underlying their respective regulations.	Select Board/Planning Board/Conservation Commission/ZBA/Etc.
	2. Distribute the WRAC Report.	Provide a copy of the report to all relevant boards, committees and departments. Additionally, share report with the public through the website, social media, and other public information outlets.	All/Director of Communications
	3. Continued conversations between the Select Board and DWWD.	As the Select Board appoints three commissioners to DWWD, bi-annual updates are recommended to ensure timely discussions and collaboration.	Select Board/DWWD
	4. Increase collaboration between the Town of Dedham, Town of Westwood and DWWD.	As the towns share a water source, greater collaboration is warranted to ensure a unified approach to issues affecting drinking water. Monthly stakeholder meetings are recommended to ensure frequent updates and collaboration.	Select Board/DWWD

Topic	Action	Reason	Board/Committee/Department
Water Conservation			
	1. Increase water conservation through public education and promotion.	Providing town residents and businesses with information on efficient use of water through behavioral, operational, or equipment changes is an essential approach to water conservation.	PZNR/DPW/DWWD
	2. Incentivize reduced private well consumption during drought.	DWWD currently enforces irrigation bans on customers when necessitated by drought conditions. These bans do not extend to residents with private wells and their use impacts the same groundwater source used by DWWD.	Board of Health
	3. Implement the latest water conservation best practices in municipal building operations and maintenance, retrofits, new construction.	Dedham has direct control over water conservation in its own buildings and should seek opportunities to improve water efficiency operationally and as construction or renovations occur.	Facilities/Building Department
	4. Increase water efficiency of new construction	Encourage water conservation in new private development during the planning and permitting process. Projects should provide plans to incorporate domestic water, irrigation, HVAC systems, and any process loads. Consider adoption of best practices such as incorporating water conservation, water efficiency, sub-metering and leak detection.	Planning Board/Building Department

Topic	Action	Reason	Board/Committee/Department
Stormwater			
	<p>1. Encourage regional collaboration.</p>	<p>The aquifer accessed by DWWD is fed from surrounding municipalities and therefore regulations in the Town of Dedham alone are not enough to ensure adequate recharge of the groundwater supply. Additionally, the Town is actively working with regional water non-profit advocacy groups such as the Charles River Water Association and Neponset River Water Association for broad based collaboration, which is a great starting point for this collaboration.</p>	<p>Select Board</p>
	<p>2. Reduce stormwater runoff on public & private properties.</p>	<p>Consider increasing the amount of runoff required to be retained on site by the Town Stormwater Management Rules & Regulations. Both the Charles River Watershed Association and the Neponset River Watershed Association have prepared flood models for the region, highlighting potential future flooding issues.</p>	<p>Stormwater</p>
	<p>3. Increase Dedham's tree canopy.</p>	<p>Preserving existing trees and planting new trees contributes to groundwater recharge by facilitating rainwater infiltration through the channels formed by their root systems. This process acts as a natural sponge, capturing water, filtering out pollutants, and replenishing the groundwater table. The tree canopy also helps to slow down rainfall, allowing it an increased opportunity to absorb into the soil.</p>	<p>Stormwater/Conservation Commission/Planning Board/DPW</p>

Topic	Action	Reason	Board/Committee/Department
Stormwater			
	<p>4. Creation of a Town "Drought Management Plan".</p>	<p>Drought has recently become a more prominent issue in the area and established procedures could help the Town to better deal with this occurrence.</p>	<p>Various</p>
	<p>5. Continued proactive analysis of future storm and flooding impacts</p>	<p>Proactive safeguards based on 2070 flooding projections can prevent costly contamination and ensure clean drinking water as climate risks grow. Given changing flooding patterns, Dedham should continue to collaborate with the Charles River Watershed Association (CRWA) and Neponset River stakeholders and utilize Massachusetts MVP grants to study existing and future flood models (www.crwa.org/watershed-model), including: 1.) Mapping how severe 2070 storms could submerge aquifer zones, and 2.) Test how flooding might leak contaminants into groundwater via cracked pipes, submerged wellheads, or saturated soil.</p>	<p>DWWD/Select Board/Stormwater/Conservation Commission/Planning Board</p>

Topic	Action	Reason	Board/Committee/Department
Water Quality			
	<p>1. Expand the Town's Aquifer Protection Overlay District (APOD)</p>	<p>The APOD is intended to mirror the Zone II map (a state-designated wellhead protection area for public wellfields), but a small section of the current Zone II map is not included in the current APOD. The APOD should be revised to reflect what is shown in the Zone II map. Given changing flooding patterns the Planning Board could also consider consulting experts to examine whether the aquifer has changed since last mapped as well as potential changes in flood prone recharge zones, and whether those changes warrant additional changes to the APOD boundaries and/or requirements.</p>	<p>Planning Board</p>
	<p>2. Reduce the use of sodium-based snow melt agents in sensitive areas.</p>	<p>Increased sodium concentrations have been noted at wells in the Fowl Meadow area adjacent to Route 95/128. To address various aspects of salt use both in this area and throughout the town, the WRAC recommends the following actions be taken:</p>	
		<p>a. Increase collaboration between the Town of Dedham and the Town of Westwood when a development is proposed in close proximity to the town boundaries.</p>	<p>Planning Board/Select Board/ Conservation Commission</p>

Topic	Action	Reason	Board/Committee/Department
Water Quality			
		b. Encourage Town of Westwood to regularly communicate with property owners to be aware of the limits placed on the use of sodium chloride deicers.	Select Board
		c. Consider increasing the use of brine for the Town's snow and ice management, which will decrease the amount of salt needed.	Public Works
		d. Increase collaboration between Dedham and MassDOT regarding snow and ice management on MassDOT-maintained roads to coordinate the products and practices utilized.	Public Works
		e. Encourage the town's regulatory boards to include on-going conditions about minimizing salt usage within permits issued to new developments.	Stormwater/Conservation Commission/Planning Board
		f. Educate private property owners about minimizing salt usage and/or alternatives.	Stormwater/Conservation Commission/Planning Board
	3. Prevent contamination from blasting activities.	Recommend that only perchlorate free blasting materials may be used in Town.	Fire Department

Topic	Action	Reason	Board/Committee/Department
Water Quality			
	4. Increase outreach on proper disposal of the following: household materials, animal waste, trash, and leaf litter.	Educate public about proper disposal of these items and how to protect our waterways and wells. Improper disposal of these items can impact water quality and safety. Educate public about household materials, dog waste impacts on water quality and safety.	Public Works/ Conservation Commission/Department of Conservation & Recreation (State)
	5. Provide additional household hazardous waste days	Offering additional opportunities provides residents with more opportunity for proper disposal of chemicals and other potential contaminants.	Public Works
	6. Compile a complete list of all septic systems within the Town.	A complete list does not currently exist and could be beneficial to ensure systems are properly monitored and maintained.	Board of Health

Topic	Action	Reason	Board/Committee/Department
Items Indirectly Related to Water Supply & Quality			
	1. Improve utility abandonment.	Work with utility companies that abandon and/or replace utility lines to remove the decommissioned lines before the completion of the project.	Select Board/DPW

The DWWD is governmental entity, established by Chapter 193 of the Acts of 1985 (pages 407-415) by the Massachusetts State Legislature to operate as an independent, self-supporting unit of government. The Act grants powers to six commissioners, three appointed by the Town of Dedham and three appointed by the Town of Westwood. The legislation provided for the sharing of information from those six commissioners to their respective select boards, in addition to the power of those select boards to request additional information.

DWWD accesses the groundwater through 17 wells. Four wells are located in Westwood by the Neponset River near University Avenue, and one well is located by Rock Meadow Brook near Dover Road. In Dedham, one well is adjacent to the Neponset River near University Avenue, and 11 wells are located by the Charles River near Bridge Street. The geographic areas that contribute water to recharging each aquifer are large and often include multiple towns.

DWWD serves a population of about 41,630 through approximately 13,243 meters and customer service lines. The Dedham-Westwood Water District has emergency water connections with Boston, Norwood, Needham, and the MWRA through metered interconnections with the DWWD system that are utilized as needed. In 2023, DWWD obtained about 12% of the water supply from the MWRA. In 2024, DWWD obtained about 23% of the water supply from the MWRA due to treatment plant maintenance.

All the sources available to DWWD, whether local or the MWRA, are combined to serve both the customers of Dedham and Westwood.

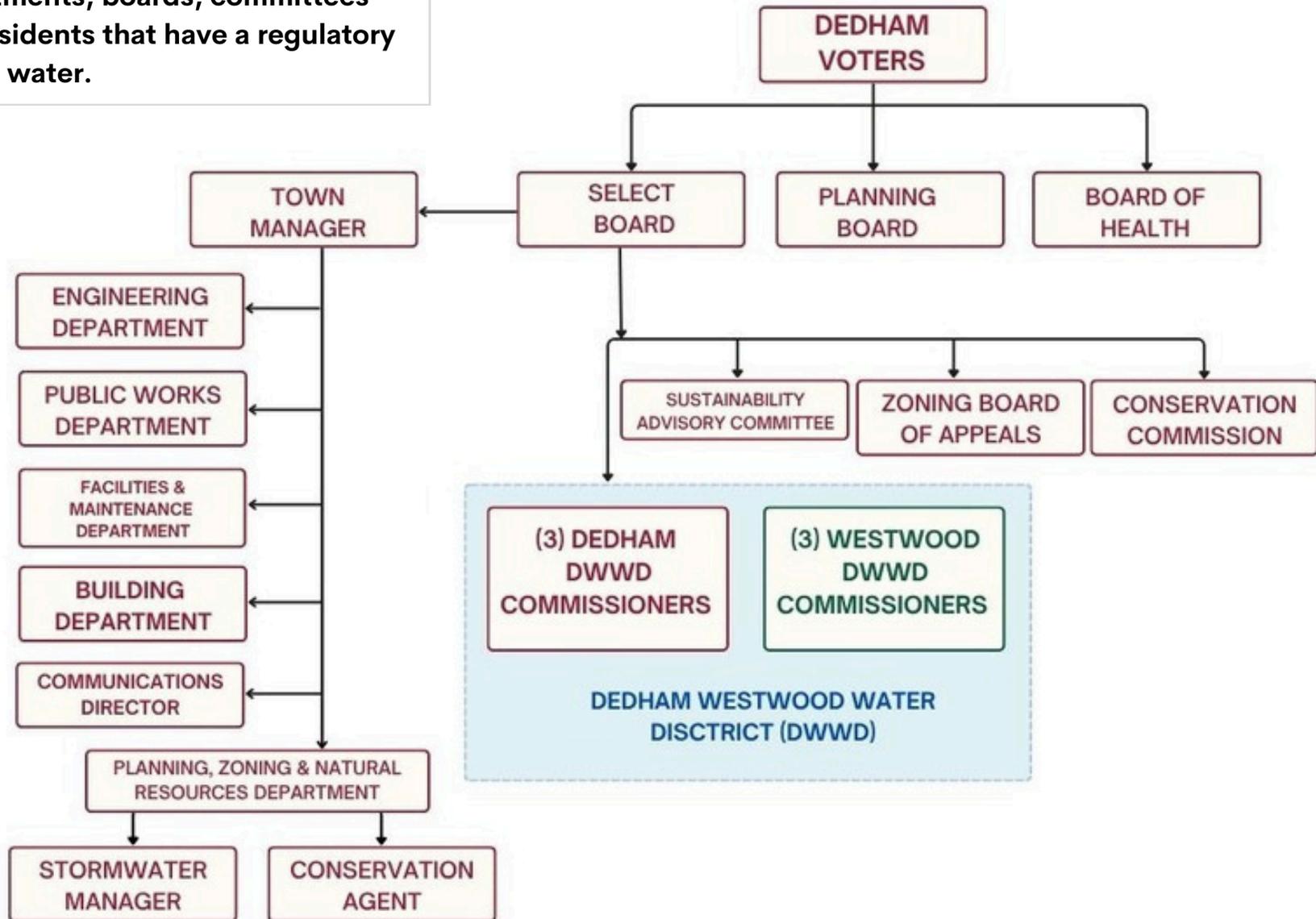
DWWD Water Treatment

Licensed Drinking Water Operators continuously monitor the treatment of your drinking water with a multi-step process. First, the water is aerated, which helps oxidize minerals such as iron and manganese. Next, the water is filtered to remove any suspended material. Chlorine is added to provide disinfection. Then, the pH of the water is adjusted to an optimal level, so it is not corrosive to pipes and plumbing fixtures. Orthophosphate is added as a corrosion control measure, and fluoride is added to prevent tooth decay/cavities.



Charles River (Town of Dedham)

Organizational chart depicting Town departments, boards, committees and residents that have a regulatory role of water.



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TOWN OF DEDHAM

INCORPORATED 1636

TOWN HALL & SENIOR CENTER

450 WASHINGTON STREET



TOWN OF
DEDHAM
MASSACHUSETTS

450 Washington Street
Dedham, MA 02026
781-751-9100

DEDHAM-MA.GOV