THE COMMONWEALTH OF MASSACHUSETTS

WATER RESOURCES COMMISSION

100 CAMBRIDGE STREET, BOSTON MA 02114

REPORT OF THE FINDINGS, JUSTIFICATIONS, AND DECISION OF THE WATER RESOURCES COMMISSION
Relating to the Approval of the
Town of Burlington's Request for an Interbasin Transfer
Pursuant to M.G.L. Chapter 21 § 8C

DECISION

On November 12, 2020, by a ten to one (10-1) vote, the Massachusetts Water Resources Commission (WRC) approved the Town of Burlington's request for an Interbasin Transfer to join the Massachusetts Water Resources Authority (MWRA) Water Works System. This vote was taken after review of the facts provided by the Town of Burlington, analysis of the associated data, and consideration of comments received concerning this request.

INTRODUCTION

On November 26, 2019, the WRC received a request from the Town of Burlington for approval of an action to increase the present rate of interbasin transfer under the Interbasin Transfer Act (ITA) (M.G.L. Chapter 21 §§ 8B-8D) as part of a Draft Environmental Impact Report (DEIR) submitted to the Massachusetts Environmental Policy Act (MEPA) office. The DEIR proposed a water supply transfer through an interconnection to MWRA. Additional information was requested by the WRC and received in the Final EIR, submitted in February 2020. The Secretary's Certificate on the FEIR was issued on April 17, 2020. The WRC accepted Burlington's application as complete at its May 14, 2020 meeting.

Burlington is proposing to purchase a maximum of 6.5 million gallons per day (MGD) of water from MWRA to supplement its existing water supply source, the Mill Pond Reservoir (Figure 1). Burlington's average day demand (ADD), based on the years 2008 to 2018, has ranged from 2.80 MGD to 3.19 MGD, while the maximum day demand (MDD) for the same time period has ranged from 4.39 MGD to 6.54 MGD. The Burlington/MWRA water interconnection project will be completed in a multi-phased approach. Phase 1 will include the construction of a 24-inch water main connection to the Town of Lexington for temporary water purchase of 1.0 MGD, after which Phase 2 will consist of a second 24-inch water main constructed to connect with the MWRA system. This intermediate step is required prior to a direct connection to the MWRA system in order to address the immediate need for water. Burlington is an existing MWRA sewer community; the rate of wastewater interbasin transfer will not change as a result of this request.

A summary of the facts described in the application is as follows:

1. Burlington has land area in the Ipswich River, Shawsheen River, and Boston Harbor basins.

2. Burlington's existing sources consist of seven groundwater wells and two surface water sources.
3. Three of the wells are offline due to 1,4-dioxane contamination. The Mill Pond Water Treatment Plant, capable of producing 2.5-3 MGD, lacks redundancy.
4. The Town is applying for admission to the MWRA Waterworks System, which has sources in the Chicopee River basin and the Nashua River basin.
5. A MEPA environmental review, pursuant to M.G.L. c. 30, §§ 61-62I, was required for this proposed action. The ITA application was submitted as part of the DEIR for this project (EOEEA #15940). Additional information for ITA review was requested through the MEPA process and provided in the FEIR.
6. The Secretary's Certificate on the FEIR was issued on April 17, 2020, stating that no further MEPA review was needed.
7. Two required public hearings were held virtually via Zoom to take comment on this application, for the donor basin on July 10, 2020 and for the receiving basin on July 13, 2020. Written public comments were accepted until July 20, 2020.
8. A draft Staff Recommendation to approve the request was presented to the WRC on August 13, 2020.
9. A public hearing on the draft Staff Recommendation was held virtually via Zoom on August 18, 2020. Written public comments were accepted until August 25, 2020.
10. A summary of comments received through the public comment periods is available under separate cover from the WRC.
11. The review period and time for the WRC Decision was extended by mutual consent of the WRC and the Town of Burlington by no more than 60 days, until December 16, 2020.

EVALUATION OF THE PROPOSED INTERBASIN TRANSFER

This Interbasin Transfer application was reviewed on its own merits and is applicable solely to Burlington's purchase and use of MWRA water. This Decision is made based on facts contained in Burlington's MEPA submissions and additional information submitted at the WRC's request during the MEPA process. The application was evaluated against the seven Criteria outlined in the ITA regulations (313 CMR 4.09), as well as the ITA Performance Standards and with consideration of comments received from the agencies and through the public comment process.

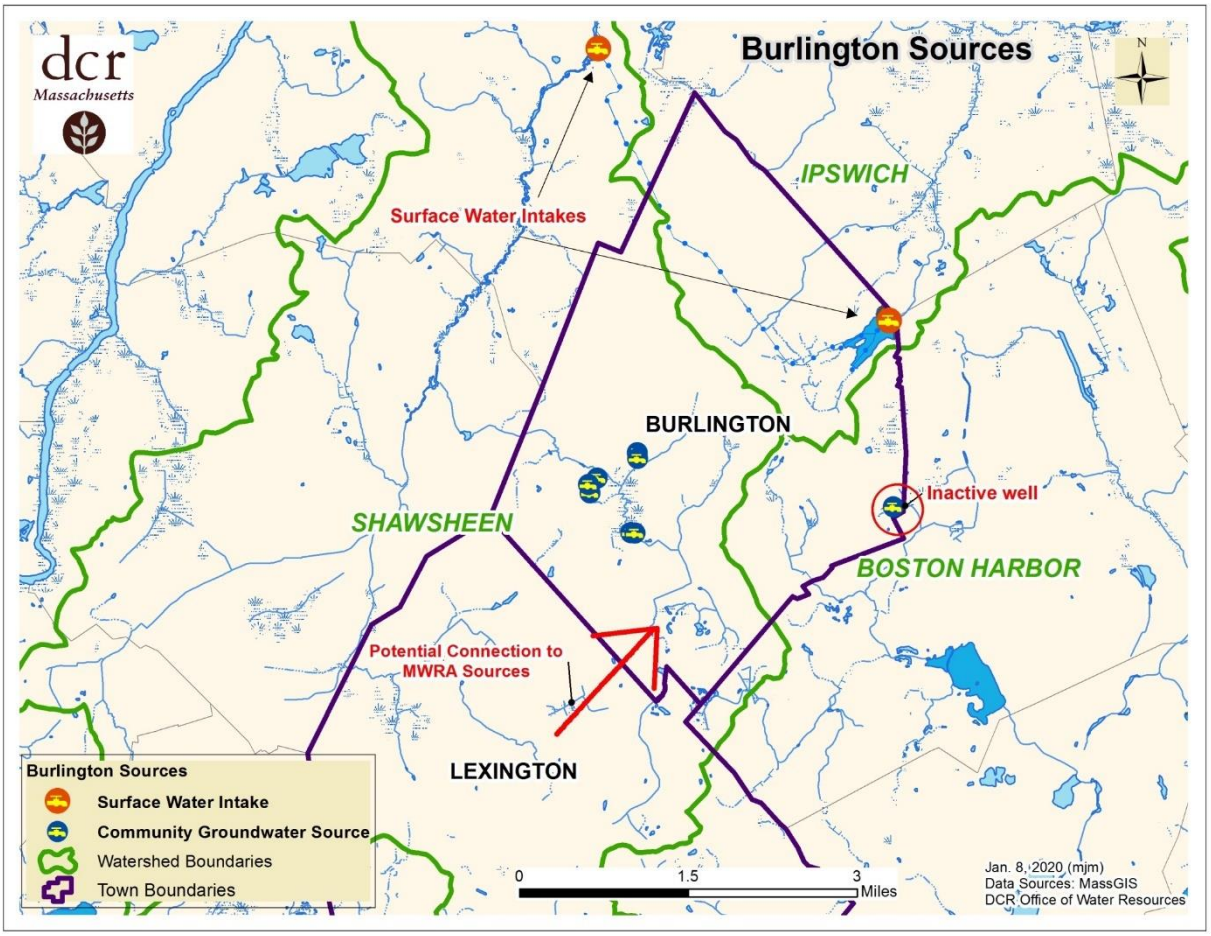
SYNOPSIS OF THE EVALUATION CRITERIA (313 CMR 4.05)

Criteria	Application Meets?
Criterion #1: MEPA Compliance	Yes
Criterion #2: Viable In-Basin Sources	Yes, with conditions
Criterion #3: Water Conservation	Yes, with conditions
Criterion #4: Forestry Management	Yes, with conditions
Criterion #5: Reasonable Instream Flow	Yes
Criterion #6: Impacts of Groundwater Withdrawals	Not Applicable
Criterion #7: Cumulative Impacts	Yes

BASIS FOR THE WRC DECISION

This application was reviewed by the Executive Office of Energy and Environmental Affairs (EEA), WRC staff at the Department of Conservation and Recreation's (DCR) Office of Water Resources, Department of Environmental Protection (MassDEP), and Department of Fish and Game's (DFG) Division of Fisheries and Wildlife and Division of Ecological Restoration. This Decision was made after an evaluation of Burlington's application and compliance with the six applicable Criteria of the ITA regulations and the ITA Performance Standards. The following section describes in detail compliance with the Criteria.

Figure 1: Burlington's Sources



Criterion #1: Compliance with MEPA

An environmental review, pursuant to MEPA (M.G.L. c. 30, §§ 61-62I) and the MEPA regulations, 301 CMR 11.00, was required for this proposed transfer. The ITA application was submitted as part of the DEIR for this project (EOEEA #15940). The FEIR was submitted in February 2020. The FEIR Certificate was issued on April 17, 2020 and stated that no further MEPA review was necessary.

Criterion #2: Viable In-Basin Sources

Burlington was required to demonstrate that it has made all reasonable efforts to identify and develop all viable sources in the receiving area. Burlington evaluated several alternatives to replace the reduction in capacity as a result of contamination in the Vine Brook aquifer. These included expanding existing sources, reactivating abandoned water supply sources, and exploring undeveloped areas in the Town where new sources could potentially be developed. However, none of these alternatives was deemed an acceptable solution that would avoid future contamination. Following is a summary of all issues considered relating to viability.

Existing Sources

The Burlington water system includes seven municipal wells, two surface water sources, two water treatment plants (WTPs), three water storage tanks and 120 miles of water mains. The seven wells are in three areas, all near Vine Brook, and are collectively treated at the Vine Brook WTP to remove naturally occurring iron and manganese, and to remove volatile organic contamination that originated at several nearby facilities. The Vine Brook WTP consists of three treatment trains, designated A, B, and C, detailed as follows:

- Train A treats Well Nos. 1 and 2 and has a design capacity of 0.8 MGD. Currently it can only produce a maximum of 0.76 MGD due to natural deterioration of the wells.
- Train B treats Well Nos. 3, 4, and 5 and has a design capacity of 0.9 MGD. This train is currently offline due to contamination.
- Train C treats Well Nos. 10 and 11 and has a design capacity of 1.4 MGD. Currently it can only produce a maximum of 1.19 MGD due to natural deterioration of the wells.

Due to the age, extensive use, and emergence of 1,4-dioxane in the wells, the production capacity of Trains A and C have been reduced. Train B was taken offline in 2013 to maintain compliance with the MassDEP 1,4-dioxane Office of Research and Standards Guideline (ORSG) because these three wells contained the highest concentration of 1,4-dioxane. Due to the reduced production capacity of the wells associated with Trains A and C and the need to take Train B offline, the capacity of the Vine Brook WTP has been reduced to approximately 1.95 MGD.

The Mill Pond WTP treats water from the Mill Pond Reservoir; the reservoir does not replenish naturally but is filled primarily with water from the Shawsheen River during periods when the withdrawal capacity is not limited by streamflow (details further below). Water is pumped from the Shawsheen River to Mill Pond by a pumping station with a capacity of up to 8 MGD through a single 4-mile-long pipe. Because it is a single main, there is no redundancy if there is a failure of this pipe. The Mill Pond WTP treats surface water from Mill Pond using conventional processes to remove naturally occurring particulate matter and produces an average of 2.5-3.0 MGD. The facility has the capability of producing up to 4.5 MGD on a very limited short-term basis depending on the elevation and raw water quality of Mill Pond. The Mill Pond WTP has several flow reducing vulnerabilities. First, the WTP was designed with a single sedimentation basin. The sedimentation basin is drained and cleaned 2-3 times per year which takes the entire facility offline. Second, should either of the two filtration trains be taken offline, the Mill Pond WTP production capacity would be reduced by half. The WTP has a single clearwell for disinfection. When the clearwell is drained, inspected and cleaned once a year, the WTP is

offline. And lastly, there is a single finished water main, a failure of which would prevent finished water from flowing to the distribution system.

Burlington's supply/withdrawal capacity is limited by restrictions on the Shawsheen River and seasonal pumping conditions. Between May 1st and June 30th, Burlington is not permitted to pump water from the Shawsheen River if river flow is less than 37 cubic feet per second (cfs) for three consecutive days in order to protect fish spawning. For the remainder of the year, withdrawals from the Shawsheen River are limited to the following:

- <12 cfs for three consecutive days – no pumping allowed
- 12-15 cfs – permitted to pump 2 MGD to Mill Pond
- 15-25 cfs – permitted to pump 4 MGD to Mill Pond
- >25 cfs – permitted to pump 8 MGD to Mill Pond

Currently, Burlington operates the Vine Brook WTP 24 hours a day, 365 days a year, and uses the Mill Pond WTP to make up the difference between Vine Brook WTP production and system demands. Because of the need for both WTPs to be in operation to meet demands, the Town is unable to perform routine maintenance on either WTP if maintenance requires the facility to be taken offline. In addition, it is recommended that pumping and treatment facilities operate a maximum of 16 hours per day to reduce wear on equipment, to allow time for routine maintenance, and to allow wells to recover. Burlington does not have this option under current operating conditions.

Alternatives Analysis

In 2016, Burlington hired Stantec Consulting Services, Inc., to complete a study entitled "Water Supply Evaluation – Future Water Demand Feasibility Study". This study evaluated five strategies for maintaining or obtaining water supplies to meet demands over a 25-year planning period. Methods for maintaining water supplies included reviewing existing sources, developing new sources, and purchasing water from the MWRA and surrounding towns. Three of the five strategies included a connection of some capacity to the MWRA. Two of the strategies considered providing treatment for 1,4-dioxane. However, neither treatment strategy addressed future unidentified contaminants. There are currently 46 known contamination sites in the areas surrounding the Town's water supply wells. The study concluded that the Vine Brook WTP was "in good working order and only currently requires maintenance work to replace and maintain aging equipment". However, the study notes that over the 25-year planning period, approximately $5.2M would need to be invested into the facility to replace equipment to keep the facility operational and reliable.

Strategies that maintained the Town's sources were the most cost-effective; however, they were not selected because they did not provide the long-term redundancy and reliability that an MWRA connection provides. A strategy that included developing new sources was also lower cost as compared to other strategies but was not selected because new groundwater sources would not eliminate the risk of pollution from future unknown contaminants, because of the widespread contamination in the Town's groundwater. The strategy that combines retaining the Mill Pond WTP with purchasing water from MWRA was selected as the recommended approach because it best met the goals of protecting public health, meeting water demands, and providing

redundancy to the water system in both the short and long term. The water supply required is estimated to be 3.5 MGD (ADD), and up to 6.5 MGD to meet MDD with Mill Pond offline.

Existing Interconnections
The Town maintains emergency connections with Bedford, Billerica, Lexington, Wilmington, and Woburn. The connections with Bedford, Billerica, and Lexington are hard-piped interconnections. The Bedford and Billerica interconnections both require booster pumps for Burlington to receive water. The Lexington interconnection is used in periods where demands exceed Burlington's production capacity. This connection has been used in recent years (since 2011) to supplement the Town's water supply during emergencies. The remaining interconnections are for emergency purposes only and are made through hydrant to hydrant connections.

Reactivation of Abandoned Water Supply Sources
The Town of Burlington has five abandoned groundwater sources, four of which are in the Shawsheen basin. These sources include the Main Station tubular wells, Sandy Brook Gravel-packed Well No. 6, Lexington Gravel-packed Well No. 7, and Sandy Brook Well No. 9. The Town also operated a source known as the Wyman Tubular Wells No. 8 in the Boston Harbor basin.

The Main Station tubular wellfield, Sandy Brook Gravel-packed Well No. 6, and Sandy Brook Well No. 9 were all officially abandoned in 2001 and sealed with concrete. The Lexington Gravel-packed Well No. 7 was removed from service in 1988 due to trichloroethylene (TCE) contamination. It was formally abandoned by MassDEP in a 1997 letter which included approval for the construction of the Vine Brook WTP and permanent pumping facilities for Well Nos. 10 and 11. As part of that work, the pump station for Well No. 7 was repurposed to house the well controls for Well Nos. 10 and 11. The Wyman Tubular Well No. 8 was inactivated in 1995 due to excessive maintenance. The well is in "Inactive" status but the Town has not formally abandoned the source. To return this source to operational status, a complete rehabilitation and overhaul of the existing building, pumping and building systems and stand-by power system would be required. It would also require the design and construction of a minimum of approximately 13,500 feet of transmission main to the Mill Pond WTP or a minimum of approximately 20,000 feet of transmission main to the Vine Brook WTP. Because of the extensive costs and limited yield, this option was not deemed a viable solution.

Development of New In-Town Water Supply Sources
The Vine Brook Aquifer is the primary groundwater source for the Town wells. The aquifer provides a significant quantity of groundwater to the Town wells, and additional yield from a new source within this aquifer would be limited by the aquifer storage. Additionally, this aquifer is within a basin that is groundwater depleted and the WMA program would likely limit further withdrawals. In addition, the wells and aquifer have become contaminated from unauthorized discharges of volatile organic compounds (VOCs). A new source sited within this aquifer would result in the withdrawal of contaminated water requiring significant treatment.

Most of the Town is mapped as till or bedrock which are not likely water-bearing at the capacity necessary to support a community groundwater source. Furthermore, much of these areas are

built out and there are few to no suitable locations for the development of a groundwater source with adequate setbacks and protection from existing and potential contaminant threats.

A parcel map of the Town of Burlington was used to identify undeveloped areas in the Boston Harbor and Ipswich River basins. These basins were investigated because they are not net groundwater depleted within the Town and would provide a source that does not derive water from the Vine Brook Aquifer. A key part of identifying suitable parcels to locate a groundwater supply is that the Town of Burlington would need to own, or control through easements, a 400-foot radius around new sources. Structures, subsurface waste disposal systems, and a variety of other potential contamination sources cannot be located within the protective radius. Large parcels within the Boston Harbor and Ipswich River basins that would support the protective radius were identified and investigated. Data suggest that the development of a groundwater well source in the Town within these basins is not viable based on surficial geology, the distribution of potential contamination sites, and groundwater depletion. Further, there are already high levels of flow stress in the Ipswich River basin. Added stress to this basin from increased groundwater withdrawals would have significant environmental impacts and may impact neighboring communities' ability to withdraw water from the basin to serve their residents.

Water Quality Issues

When considering developing new water supply sources, water quality is also of concern. If the new sources would be located in existing wellfields, the reliability of these sources cannot be guaranteed. The Town reports that it has recently seen a slight increase in 1,4-dioxane levels in the remaining active wells. It is suspected that this is a result of plume migration from the previously active Well Nos. 3, 4, and 5 which are now out of service. Because of the widespread contamination in the Town's groundwater, Burlington is also concerned that new unknown contaminants that will also require treatment could be identified under the Environmental Protection Agency (EPA) Unregulated Contaminant Monitoring Rule (UCMR).

The risk of new contaminants has recently also become a real concern for Burlington. It was recommended that both Mill Pond and Vine Brook conduct testing for per- and polyfluoroalkyl substances (PFAS) which, if found in excess of the ORSG of 20 parts per trillion (ppt), has the potential to impact Burlington's remaining water supply. The Town will sample its sources in accordance with MassDEP's schedule. As of December 2019, MWRA has performed testing for 18 PFAS compounds resulting in negligible amounts well below all federal and state guidelines.

Future Plan for Use of Sources

The Town expects to maintain the Mill Pond WTP in service for at least another 20 years. The treatment plant is of modern design and well suited to treat the water from Mill Pond. When Burlington takes the Mill Pond WTP offline, it may consider abandonment and relinquishment of its WMA permit.

Following the connection to MWRA, Burlington intends to take the Vine Brook WTP out of service. However, it will be maintained in a "ready" state for emergencies for 5-10 years and/or until the Town is confident in the new MWRA supply and Mill Pond WTP configuration and operation. During the period of "ready state", the Town will routinely exercise pumps and

valves associated with the wells. Well Nos. 1, 2, 10, and 11 will be maintained in an "inactive" ready status and will be pumped through the Vine Brook WTP monthly. These wells will only be used with an Emergency Declaration issued by MassDEP under M.G.L. c21G, §§ 15 and 16, 310 CMR 36.40 through 36.42 or otherwise authorized by law. The Town intends to retain its WMA registration for each well source. When the decision is made to completely remove the Vine Brook WTP and wells from service, the WTP will be decommissioned and demolished and the wells associated with the facility will be abandoned. The Town intends to retain ownership of the upland areas of the property for future municipal needs. It may however consider converting the wetland areas to conservation land.

In conclusion, the basic requirement of the ITA is that local water supply sources are used to the maximum extent possible prior to obtaining permission to transfer water from out of basin. Given the above described conditions, the WRC determined that all reasonable efforts have been made to identify and develop all viable sources in the receiving area of the proposed interbasin transfer.

Criterion #3: Water Conservation

Burlington was required to demonstrate that all practical measures to conserve water have been taken. The WRC water conservation performance standards are numbered below, followed by a bulleted narrative of Burlington's actions.

1) A full leak detection survey should have been completed within the previous two years of the application. The proponent should provide documentation regarding repair of leaks identified during the survey.

- Leak detection is conducted at least every two years.
- Surveys were completed in 2015 and 2017 and documentation was submitted that leaks were repaired.
- Another survey was completed from January to February 2019 and documentation was submitted that leaks were repaired.
- According to the Water Conservation Survey submitted as part of the February 2020 FEIR, another survey was ongoing in 2020.

2) The water supply system should be 100% metered, including public facilities served by the proponent. A program of meter repair and/or replacement must be in place. Documentation of annual calibration of master meters and a description of the calibration program should be included in the application.

- Burlington's system is 100% metered, including public facilities.
- A program of meter repair and replacement is in place and is funded through an annual appropriation.
- Master meters are calibrated annually.
- Burlington owns all customer meters, including large meters. A description of the large meter calibration program was included in the Water Conservation Questionnaire submitted in the FEIR.

3) Unaccounted-for Water (UAW) should be 10% or less. The proponent should provide documentation of UAW, in both gallons and percentage of the total finished water entering the

distribution system, for each of the past five years. The definition of accounted-for and UAW for use in Interbasin Transfer applications is given in Appendix C of the Performance Standards.

- For more than the past five years, UAW has been 10% or below.

4) The proponent should provide documentation to show that there are sufficient sources of funding to maintain the system, including covering the costs of operation, proper maintenance, proposed capital improvements, and water conservation. The rate structure must encourage water conservation.

a) Sufficiency of Funds

- Water system operation costs are funded through customer bills with a combination of fixed service charges and volumetric usage charges. Water system capital costs are primarily funded through property taxes. The specific capital funds needed for the proposed project to join the MWRA, however, are being raised through an annual seven percent rate increase over ten years. The reliance on the property tax to fund the majority of capital needs for the water system means Burlington does not utilize full-cost pricing. Full-cost pricing is preferable for sending a strong conservation signal, equitably allocating costs, and raising customer awareness of the true cost of the water system. For these reasons, a transition to full-cost pricing is recommended. However, the WRC acknowledges that Burlington prefers to keep the subsidy in place, in part because it shifts a larger percentage of the cost burden to the commercial sector, which is preferable to the community. The WRC further recognizes that, accounting for the subsidy, the two sources of funding combined have historically been sufficient to cover all water system costs, including operation, maintenance, capital costs, conservation, source protection, and debt service. The Department of Public Works uses a 10- to 20-year planning horizon, which helps ensure long-term capital needs are adequately accounted for in budgeting.
- All revenues raised through customer bills are sent to Burlington's general fund. Water system costs are then paid for out of the general fund. Water bill revenues are closely tracked, and the general fund allocation to the Department of Public Works for the water system is set to equal the funds raised by customer bills plus the additional funds raised through the town's property tax. While this structure helps establish a cost basis for the water system, utilizing an enterprise fund or similar structure for the revenues raised through customer bills is strongly recommended. Even if the enterprise fund continued to be subsidized by property taxes, it would clarify expense categories, make the level of subsidy from property taxes more apparent, provide protected structures for retained earnings, such as the stabilization fund currently being used to build up reserves for joining the MWRA, and reduce the need to rely on allocations from the general fund to utilize revenues from customer bills. It would also create a smoother transition to full-cost pricing when Burlington is able to pursue that in the future, which would increase customer incentives for water conservation.

b) Strength of Water Rate Conservation Signal

- Burlington has three separate rate structures: one for primary residential accounts, one for secondary/irrigation residential accounts, and one for commercial accounts. Each of

these has a tiered structure, a base service charge, and a base allocation for which customers do not pay any volumetric charges.

- The primary residential rate includes a base allocation of 20,000 gallons per six-month billing cycle, which is roughly equivalent to 40 gallons per capita per day (gpcd) for the average Burlington household of 2.72 residents (US Census Bureau). The Massachusetts Water and Wastewater Rates Dashboard developed by the UNC Environmental Science Center places Burlington's water rates extremely low on a relative scale within Massachusetts, over a wide range of usage volumes, and shows the rate's "conservation signal" (price per gallon over 10,000 gallons of monthly use) to be similarly low. After incorporating Burlington's projected 10 years of 7%-per-year increases, the average household's volumetric charges at 65 gpcd (the state year-round residential standard) will still be in the bottom 12% among Massachusetts water rates. While it is strongly recommended this price signal be strengthened by eliminating the base allocation and moving to full-cost pricing, the WRC acknowledges that Burlington's residential sector demonstrates efficient water use patterns on the whole. The town-wide rgpcd is 50. Additionally, 70% of the customer base uses 30,000 gallons or less per billing cycle. This is equivalent to 61 gpcd for the average household.
- The secondary/irrigation rate includes a base allocation of 5,000 gallons per annual billing cycle. As outdoor irrigation is a nonessential use, Burlington must eliminate the base allocation within the secondary residential rate. Additionally, the first pricing tier applies to 5,000 – 50,000 gallons of annual use. Assuming an irrigation season of six months, this represents a range for the average household that spans from 10 gpcd to 100 gpcd of exclusively outdoor use. The state standard for indoor and outdoor use combined is 65, so 100 gpcd of only outdoor use far exceeds the state efficiency standard. Burlington also must create new tier volumes for the secondary residential rate that more effectively distinguish between efficient and inefficient outdoor usage and send stronger price signals for less efficient use. WRC staff is available to work with Burlington to assess compliance with this condition.
- Approximately 50% of Burlington's water use is from the commercial sector. The commercial rate includes a base allocation of 10,000 gallons per quarterly billing cycle. 40% of Burlington's commercial customers do not exceed the base allocation and, therefore, pay no per-gallon charge for their water, which does not effectively encourage water conservation. Burlington must substantially reduce or eliminate the base allocation for commercial customers.

5) The proponent should bill its customers at least quarterly based on actual meter readings. Bills should be easily understandable to the customer (e.g., providing water use in gallons and including comparison of the previous year's use for the same period).

- Burlington bills its commercial customers quarterly, its primary residential customers biannually, and its secondary customers annually.
- Large users are billed quarterly.
- Bills are based on actual use and are billed in gallons.
- Customer meters are read daily and reviewed monthly. The water department reaches out to customers with spikes in use that may reflect a leak.
- Bills provide customers with their water use history, including comparisons to the previous year's use for the same period.

- Although the WRC acknowledges that Burlington achieves some of the benefit of quarterly or more frequent billing by monitoring meters monthly, to meet this performance standard Burlington must move to at least quarterly billing for its primary residential accounts and incorporate one additional billing cycle, mid-irrigation season, to achieve the equivalent of quarterly billing for its secondary residential accounts.

6) A drought/emergency contingency plan, as described in 313 CMR 4.02, should be in place. This plan should include seasonal use guidelines and measures for voluntary and mandatory water use restrictions and describe how these will be implemented. There should be a mechanism in place to tie water use restrictions to streamflow and/or surface water levels in the affected basin(s) where this information is available.

- Burlington has a local drought plan with seasonal use guidelines for water use restrictions based on the levels in Mill Pond and the flows in the Shawsheen River.
- In addition, since 2017, the Town has implemented year-round watering restrictions.
- With membership to the MWRA, the Town will need to update its drought plan to reflect the changes in water supply sources for both the MWRA sources and the remaining local source(s).
- Additionally, when updating its drought plan Burlington should review the 2019 (or most recent) Massachusetts Drought Management Plan and incorporate applicable recommended elements from the state plan into its local plan. It should also incorporate conditions that tie the local plan to drought declaration and any recommended actions by the Secretary of EEA for the Northeast Drought Region, and to Burlington's private well regulations.

7) All government and other public buildings under the control of the proponent should have been retrofitted with water saving devices.

- The Town has a lot of newer buildings constructed in mid to late 1990's which have water saving fixtures installed.
- As public buildings in Town are renovated, they are retrofitted with water saving devices meeting the State Plumbing Code.
- Burlington should ensure that its buildings, facilities, and landscapes are using water efficiently both indoors and outdoors. Burlington should use its smart water metering system to analyze existing water-use data to spot trends, patterns, and unexplained increases that could indicate leaks or inefficient use of water, including monitoring its facilities for leaks and ensuring compliance with water bans at public facilities. Public buildings and facilities that use large amounts of water should be investigated for potential retrofits of fixtures if they are not low flow. Where feasible, use the best available technologies for water conservation for both retrofitted facilities and new construction.

8) If the community's residential gallons per capita per day (rgpcd) is greater than 65, the proponent should be implementing a comprehensive residential conservation program that seeks to reduce residential water use.

- Burlington's rgpcd has been below 65 for more than the past five years. The five-year average is 50 rgpcd.

9) A broad-based public education program, which attempts to reach every user at least two times per year, through such means as mailings, billboards, newspaper articles, cable television announcements or programs, or the use of other media, should be in place.

- The Town website links to the MWRA water conservation website in addition to the May 2002 WRC document "Guide to Lawn and Landscape Water Conservation". Pamphlets and handouts available at the Town Hall in the Engineering Department outline effective methods to conserve water during the summer months and indoor water conservation. It is recommended that Burlington also link to the state water conservation website and use those resources for more targeted water conservation tips, tools and messaging.
- Social media is used to post water conservation information, including information about lawn watering.
- There is targeted outreach for large users. Bill stuffers are mailed as needed.
- Low-flow showerheads and faucet aerators are available to the public upon request.

10) A program which identifies and ranks all industrial, commercial and institutional (ICI) customers according to amount of use and requires regular contact with the largest users to promote water conservation, should be in place. Materials on water reuse and recirculation techniques should be provided, where appropriate.

- Burlington has a metering system that can identify large users and provide ICI customers with daily and hourly usage for the ICI customers' water conservation efforts.
- The Town ranks its top users and monitors their water use with the Town's metering system. The Town has worked closely with its highest user, who hired a consultant 4-5 years ago to assist with reducing its utilities including water, and the Town has since observed a downward trend in use. The other top users are hotels and restaurants. The Town has reached out to these users to help them lower their water use without any positive impact. However, one large office user, who is not within the top 10 water users but progressive in water conservation, has worked with the Town.
- The Town ensures compliance with the plumbing code and provides information upon request.
- The Town should continue to monitor water use on its metering system for high usage and suspected leaks and notify the users as needed. The Town should more proactively reach out to the top 10 users to direct them to EPA's WaterSense website that has information regarding conservation strategies applicable to the top 10 users (such as hotels, restaurants, etc.) to help emphasize the importance of water conservation.

11) A program of land use controls to protect existing water supply sources of the receiving area that meets the requirements of MassDEP should be in place.

- Records provided by MassDEP confirm that the Town of Burlington has adopted the following protection controls:
    - Burlington Aquifer and Water Resource Districts Bylaw, 1996 as amended
    - Burlington Aquifer and Water Resource Districts Map, 1996 as amended
    - Burlington Board of Health Floor Drain Regulations, 2018
- As a result of adopting these controls, Burlington Water Department is in full compliance with the wellhead protection requirements for its public water supply wells.

- Additional controls to protect surface water supply sources (i.e., Mill Pond) may be needed. Burlington should submit any water supply protection bylaws that it has for active/inactive reservoirs to MassDEP for review for compliance with 310 CMR 22.20C.

12) There should be a long-term water conservation program, which conforms with the 2018 Water Conservation Standards for the Commonwealth of Massachusetts and is informed by analysis of Burlington's water use data. The program should include but not be limited to an indoor and outdoor component, a water loss control program, and the development of water rates that provide incentives for water efficiency. The program should also include a public outreach and education component. The program should be documented in written form and updated regularly or at a minimum after each significant drought event.

- Burlington should continue its water loss control program and review and revise it in accordance with standard industry best management practices.
- Review of the DEIR, FEIR, and Burlington's Water Conservation Questionnaire, in addition to the information evaluated above in performance standards 1 through 10, indicates that this standard is largely met, except for an updated drought plan, a water loss control program, and billing, all of which are specified as conditions in this Decision.
- Burlington's rgpcd is below 65. The five-year average is 50 rgpcd. Burlington should continue its efforts to remain at that level or below.

Notwithstanding the above assessment, the WRC recognizes that in certain cases, local conditions may prevent a proponent from meeting or exceeding the "yardstick" that has been described in ITA guidance, even after a substantial effort has been made. In these cases, the proponent should explain why that standard cannot be met, demonstrate an alternate method of meeting the intent of the standard, and document any efforts that have been undertaken in order to comply with the standard. Therefore, the standards are presented as presumptions that can be rebutted in cases where local conditions or other extenuating circumstances must be taken into consideration.

Summary of Water Conservation Criterion

Based on the information evaluated in performance standards 1 through 12 above, the WRC finds that the water conservation Criterion of the ITA will be met upon implementation of conditions.

Criterion #4: Forestry Management Program

This Criterion requires that a comprehensive forestry management program has been implemented on any watershed lands with surface water sources serving the receiving area (Burlington) and under the control of the receiving area. Burlington's FEIR provided a list of allowable activities and practices on its watershed properties to ensure surface water protection.

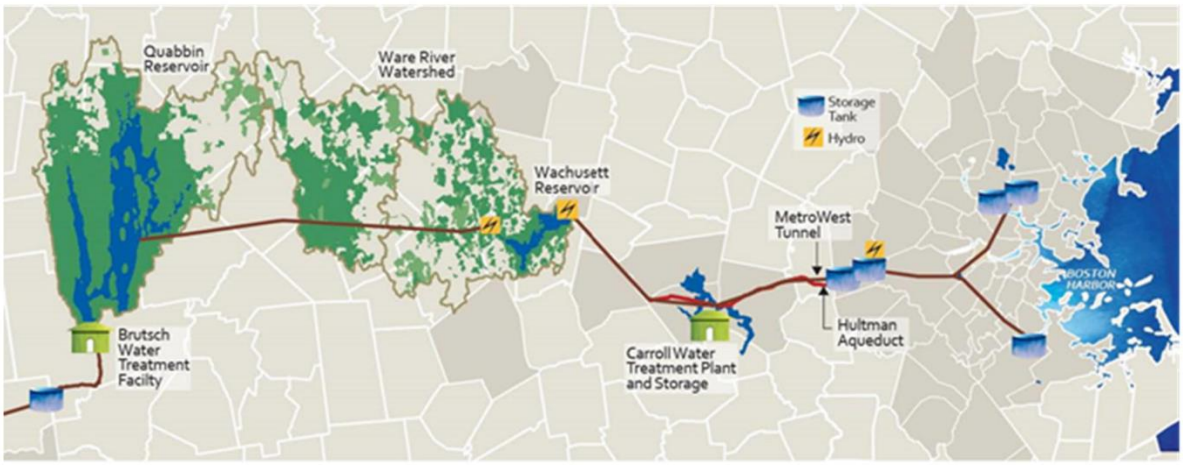
- Burlington should develop a local Surface Water Supply Protection Plan for Mill Pond Reservoir. MassDEP's Drinking Water Program is available to provide GIS maps, guidance and technical assistance. The plan shall include a component on forestry for watershed protection, should Burlington have plans to conduct forestry operations on town-owned properties.

Criterion #5: Reasonable Instream Flow and Criterion #7: Cumulative Impacts
Burlington is proposing to purchase up to 6.5 MGD of water from MWRA.
Criterion #5 requires that "reasonable instream flow in the river from which the water is transferred is maintained." In addition, per Criterion #7 the WRC must consider the "cumulative impacts of all past, authorized or proposed transfers on streamflows, groundwater, lakes, ponds, reservoirs or other impoundments in the Donor Basin and relevant sub-basins".

The ITA regulations (313 CMR 4.09(e)) direct the WRC to consider that "reasonable instream flow in the river from which the water is transferred is maintained" in making its decision to approve or deny an Interbasin Transfer request. In this case, the WRC evaluated the impacts of transferring 6.5 MGD on the operations of the MWRA Water Works System, which include impacts to reservoir levels, drought levels, low flows, intermediate flows, high flows, and the MWRA's mandated downstream releases. In addition, the cumulative impacts of the Burlington transfer, other recently approved transfers, and other potential new transfers to communities which may be added in the near future were evaluated. These transfers could result in an additional combined annual average of 10 MGD of system demand and includes the recently approved Ashland ITA transfer of up to 1.6 MGD. In its analysis of these Criteria, the WRC relied on data provided in the Burlington DEIR, FEIR, information regarding the MWRA system in a document titled, "MWRA Water System Supply and Demand" (May 2002), and previous WRC Decisions. Streamflow data and reservoir release data for the analysis were obtained from the US Geological Survey and previous WRC ITA reviews.

<u>Quabbin & Wachusett Reservoirs, Ware River and MWRA Water Works System</u>
The principal components of the system consist of the Quabbin Reservoir, Wachusett Reservoir, and the Ware River intake, the deep rock tunnels which deliver water eastward, and approximately 285 miles of pipe that distribute water to MWRA communities (Figure 2). The capacity of the transfer system is based on detailed design analysis as well as empirical operating history.

Figure 2 MWRA Water System Map



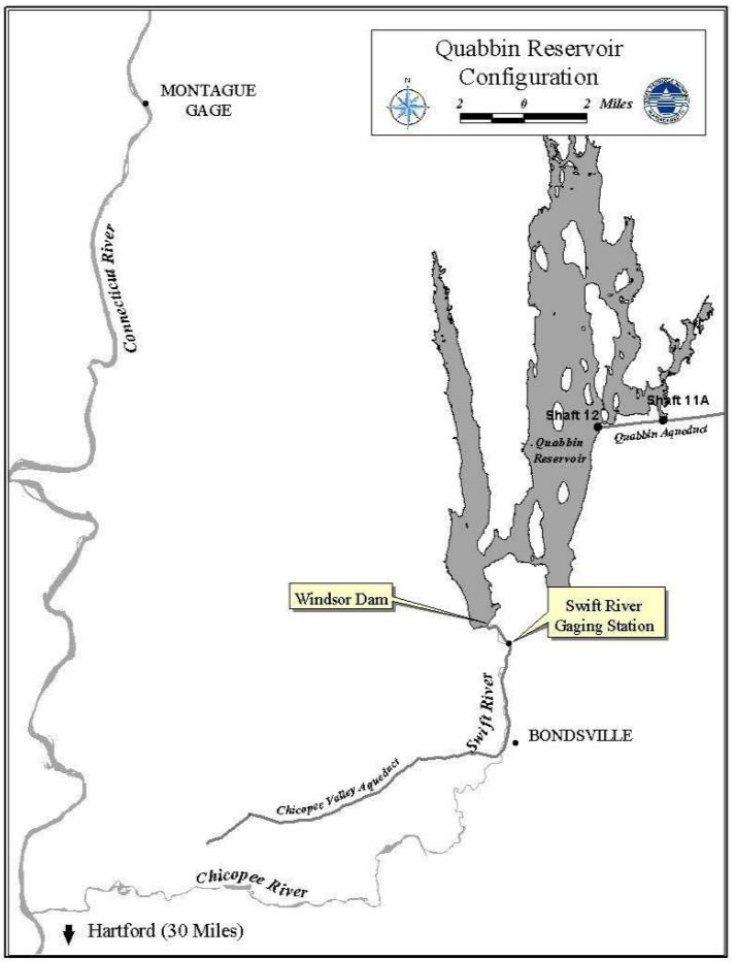
The Quabbin Reservoir, Wachusett Reservoir, and Ware River system is operated with the primary objective of ensuring high quality adequate water supply. Secondary operational objectives include maintaining an adequate flood protection buffer particularly during the spring melt and hurricane seasons and maintaining required minimum releases to both the Swift and Nashua Rivers.

Operating Schedule of the Proposed Interbasin Transfer
Burlington proposes to ultimately withdraw approximately 3.5 MGD ADD and up to 6.5 MGD on a maximum daily basis (MDD). Given that MWRA's reservoirs are multi-year storage reservoirs with 477 billion gallons of storage, the variation in Burlington's demand from MWRA over a 24-hour period, or day-to-day or between winter and summer months is of no significance to reservoir operations.

Quabbin Reservoir
The Quabbin Reservoir, located in the Chicopee River Basin, has a well-protected watershed area of 186 square miles, and a maximum storage capacity of 412 billion gallons, equivalent to between five- and six-years' worth of supply. The Quabbin contributes about 53% towards the system safe yield of 300 MGD. In addition to the water flowing directly into it, the Quabbin Reservoir can also receive water from the Ware River (also in the Chicopee River basin) via the Ware River intake. The Quabbin Reservoir is connected by the Quabbin Aqueduct to the Wachusett Reservoir in the Nashua River basin. Transfers from the Quabbin Reservoir control the Wachusett Reservoir elevation, which is kept within a narrow operating range mostly for water quality purposes, while allowing the Quabbin Reservoir to freely fluctuate. Uncontrolled releases, or unintended spills, can occur occasionally over the Quabbin spillways. There have also been extended multi-year periods when no spillway discharges have occurred.

Minimum Flow Requirements – Releases from the Quabbin Reservoir to the Swift River
Chapter 321 of the 1927 Acts of Massachusetts and the 1929 War Department Requirement call for minimum discharges to the Swift River. Sufficient water must be discharged from the Quabbin Reservoir to provide at least 20 MGD (30 cfs) in the Swift River at the Village of Bondsville located five miles downstream of Winsor Dam (Figure 3). At least 18 MGD, and more typically 20-25 MGD, is continually released from the Winsor Dam each day. This satisfies the 20 MGD requirement since the intervening watershed between Winsor Dam and Bondsville is estimated, on average, to contribute 4 MGD. Additionally, 6 MGD is supplied to the McLaughlin Fish Hatchery through a direct pipeline from the Quabbin, which is returned to the Swift River upstream of Bondsville.

Figure 3 Quabbin Reservoir



A 1929 War Department permit (now overseen by the Army Corps of Engineers) also requires seasonal releases from the Winsor Dam to maintain flow for navigability on the Connecticut River between June 1 and November 30. The seasonal releases are 70 cfs (45 MGD) if the flow in the Connecticut River, as measured at the Montague stream gage, falls below 4,900 cfs, and 110 cfs (70 MGD) if the Montague gage falls below 4,650 cfs.

Wachusett Reservoir

Wachusett Reservoir has a maximum capacity of 65 billion gallons and a 107 square mile watershed that is more developed than the Quabbin watershed. The Wachusett Reservoir contributes about 34% of the system safe yield of 300 MGD. Wachusett Reservoir is managed for continuous water availability, optimal water quality, minimum release requirements, and flood control. The Reservoir's elevation is maintained within a narrow operating band. When Wachusett Reservoir watershed yields are sufficient to maintain Reservoir elevations within the normal operating range, and transfers from the Quabbin are made for water quality purposes, higher levels of releases from valves at the Wachusett Dam to the Nashua River may be required to maintain adequate freeboard to minimize flooding potential.

Minimum Flow requirements- Releases from Wachusett Reservoir to the Nashua River
The MWRA releases water to the Nashua River consistent with Chapter 488 of the Acts of 1895, which requires that not less than 12 million gallons per week be discharged into the South Branch of the Nashua River (or on average 1.71 MGD equivalent to 2.6 cfs). This release is made via a continuous release into the basin at the base of the Wachusett Dam and is typically higher than required.

Ware River
The Ware River, at its intake, has a watershed area of 96.8 square miles. The Ware River contributes approximately 13% of the total system safe yield of 300 MGD. Under the operating approach currently implemented by the MWRA, transfers from the Ware River are made only on a limited basis for flood control or to help fill the Quabbin Reservoir when its levels are beneath their seasonal normal values.

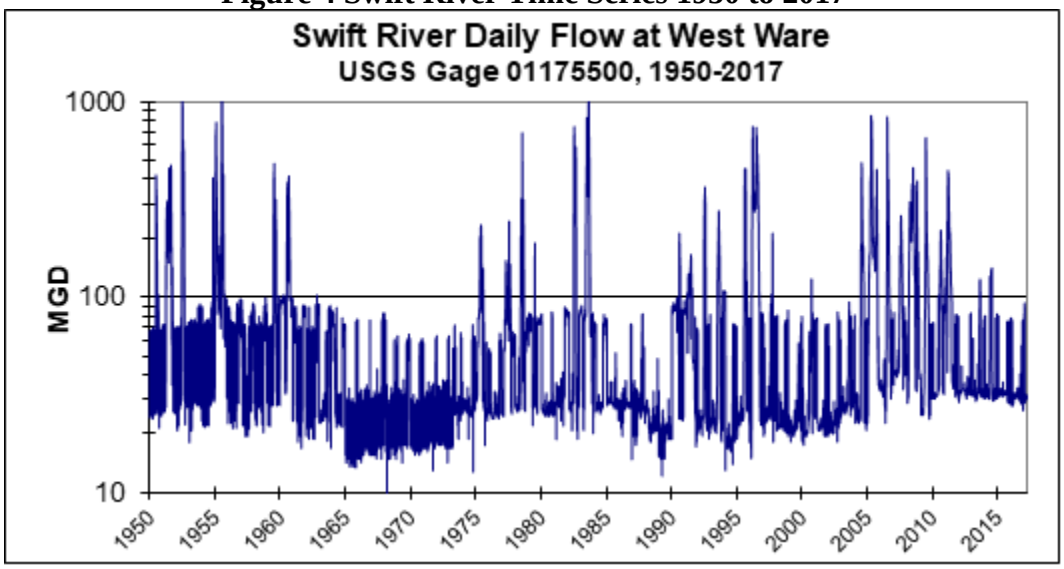
Minimum Flow Requirements- Ware River
Transfers from the Ware River to Quabbin Reservoir are only allowed at Ware River flows above 85 MGD (131 cfs), and must be limited to the period from October 15 to June 15. In addition, permission must be obtained from the Army Corps of Engineers to transfer water during the periods of June 1 through June 15 and October 15 through November 30.

Hydrologic Analysis
Several types of data are available to evaluate the potential impact of the Burlington transfer, as well as any planned or proposed transfers, on the Quabbin Reservoir. Streamflow data, or a hydrograph showing the impact of the proposed transfer on the donor river basin, is usually evaluated as part of an interbasin transfer review. However, several factors make the use of downstream flow data difficult in this case. First, the Quabbin Reservoir has a huge storage capacity, which is used to maintain a constant minimum flow. Second, the current MWRA system demand is significantly lower than its historic demand; therefore, superimposing the transfer on a historic downstream hydrograph would not be realistic. For these reasons, other types of data, including releases and reservoir levels, are being used to evaluate these Criteria. To account for the change in system demand, some of the analyses have used a shortened period of record on which to superimpose the transfer. Due to the presence of large water supply dams and their associated reservoirs, Aquatic Base Flow (ABF) criteria were not applied to downstream releases, since the outflows from the dams would not reflect the size of the watersheds above the dams on a cubic feet per second per square mile (cfsm) basis.
The Burlington application indicates that in general, given the relatively small size of the transfer in comparison to the capacity of the reservoir and the magnitude of discharges over the spillway, and the discharges governed by regulatory requirements, the effects from the proposed withdrawals on hydraulic characteristics will be imperceptible. Intended downstream releases at Quabbin, Ware, and Wachusett will not change. There would only be a slight reduction in unintended spillway flows at Quabbin.

Quabbin Reservoir and Swift River
Both time series flow graphs and flow duration curves are used to describe river flow conditions. Figures 4 and 5 show both the time series and flow duration curve for the Swift River at the West Ware gage for the time period of 1950 to 2017. The Swift River West Ware gage is located 1.4

miles downstream from Winsor Dam and has a period of record from 1913 to present. The West Ware gage is located approximately 3.6 miles upstream of the compliance point at Bondsville. The intervening drainage area between the two points is reported to contribute 4 MGD of base flow (MWRA Water System Supply and Demand, 2002).

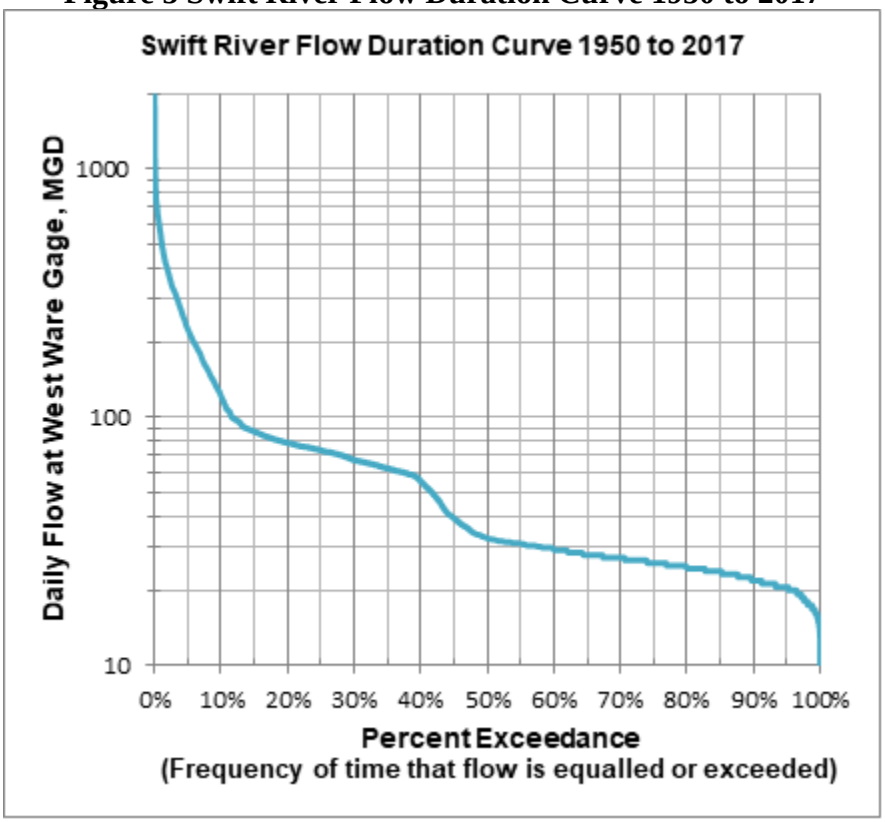
Figure 4 Swift River Time Series 1950 to 2017



Because the mandated flow requirements have been maintained, even during periods when demands were over the current level, and through the 1960's drought of record, it is assumed that those releases will continue to be met and permit conditions will be satisfied under the proposed transfer demand scenarios. Additional demands from Burlington are not expected to affect Swift River releases from the Quabbin Reservoir, which represent the majority of low flows.

Flow variation is evident in the time series graph, and the flow duration curve depicts the very high frequency of flows that exceed the minimum release requirement from the Quabbin Reservoir.

Figure 5 Swift River Flow Duration Curve 1950 to 2017



Controlled releases are significantly greater than the estimated natural 7Q10 flow as a result of the 20 MGD requirement at Bondsville. Rather than low August flows, the War Department permit frequently requires higher releases in the summer months in response to the Montague gage on the Connecticut River. When flows drop below trigger levels on the Connecticut, MWRA must release either 45 or 70 MGD.

While only minimum release requirements apply to the Quabbin Reservoir, data from USGS gages indicate that intermediate flows occur as a result of releases above the minimum requirements for the Swift River. There will only be a slight reduction in unintended spillway flows at Quabbin. The additional demand of Burlington will not in itself cause any change in how the Reservoir is operated.

Variability in Swift River flows is attributed to operational practices in a given year, the varying War Department permit releases, the use of the spillway as the reservoir nears full, as well as climatic conditions, and this variability will remain with or without the supply to Burlington.

Wachusett Reservoir and Nashua River
Flows between 1.8 and 100 MGD may be released through a valve in the Wachusett Dam to control the reservoir level or when Wachusett Reservoir is being supplemented with Quabbin water for water quality purposes. Flows above 100 MGD occur when the Wachusett Reservoir spillway crest gate is activated for larger releases and spilling. Previous analysis for the time

period of 1938 to 2006 showed that a minimum of 1.71 MGD release or greater occurred most of the time (Figures 6 and 7).

Figure 6 Time Series Releases from Wachusett Reservoir to Nashua River, 1938 to 2006

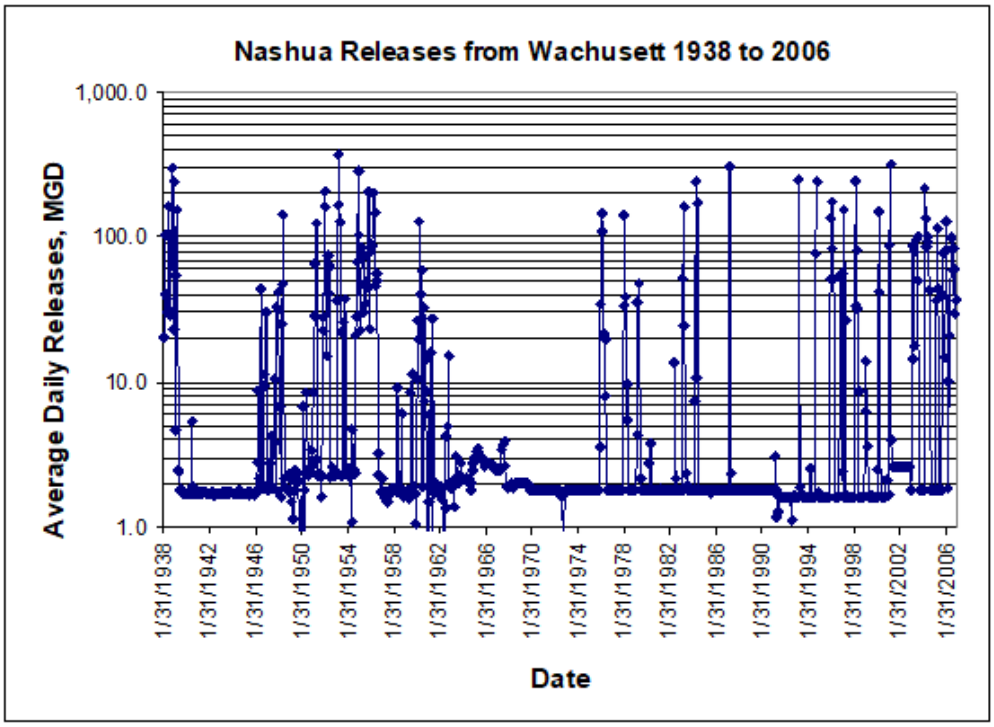


Figure 7 Wachusett Releases Flow Duration Curve 1938 to 2006

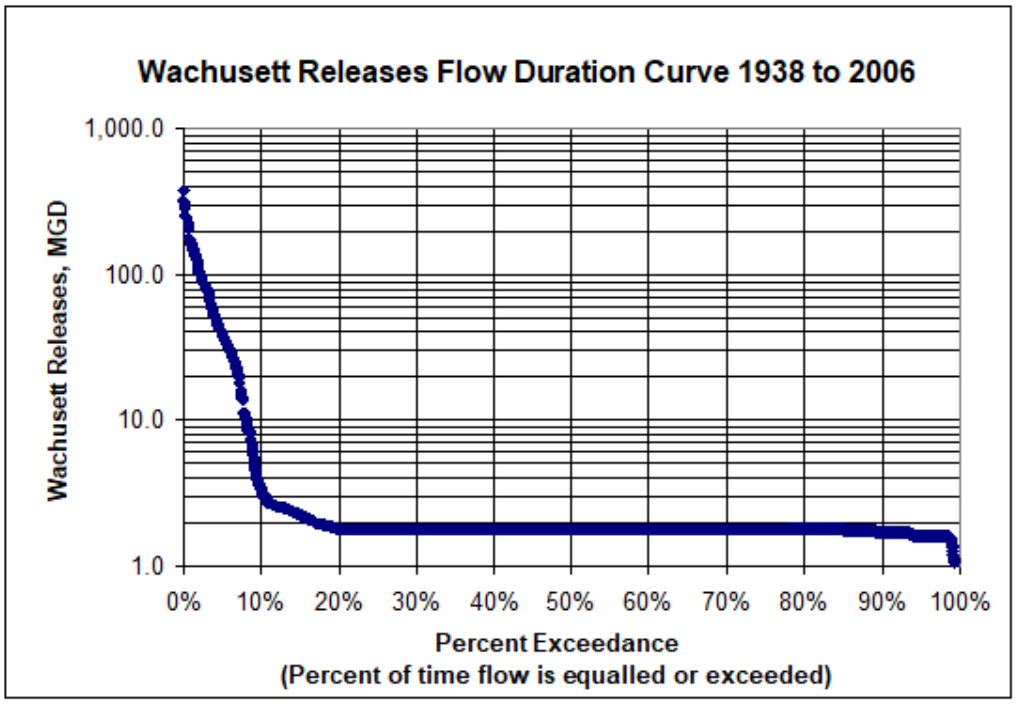


Figure 8 shows a times series of Nashua River daily releases from 2002-2018 taken from the DEIR.

Figure 8 Time Series Releases from Wachusett Reservoir to Nashua, 2002 to 2018

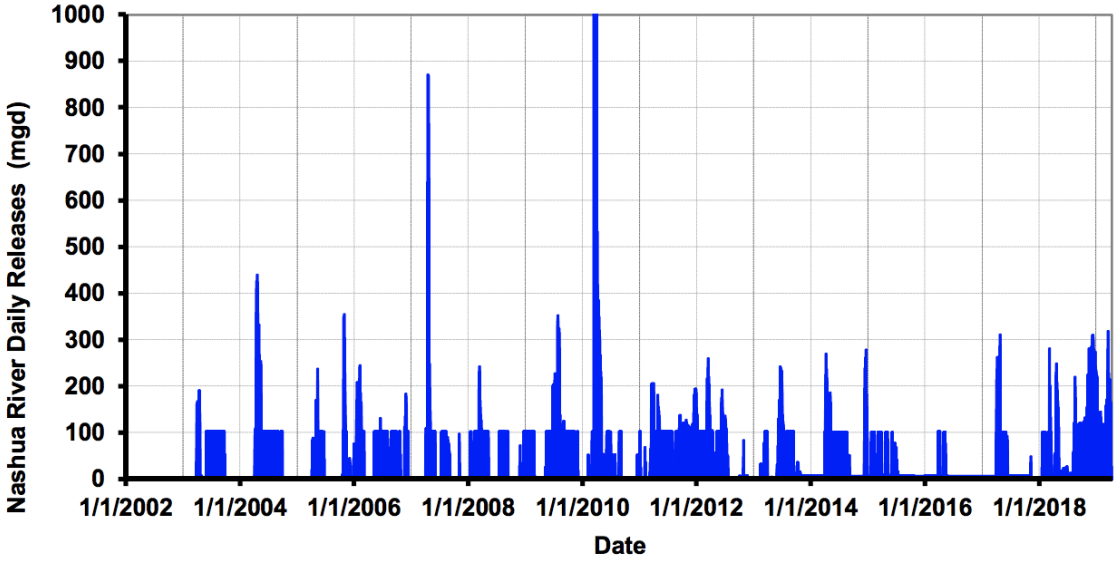
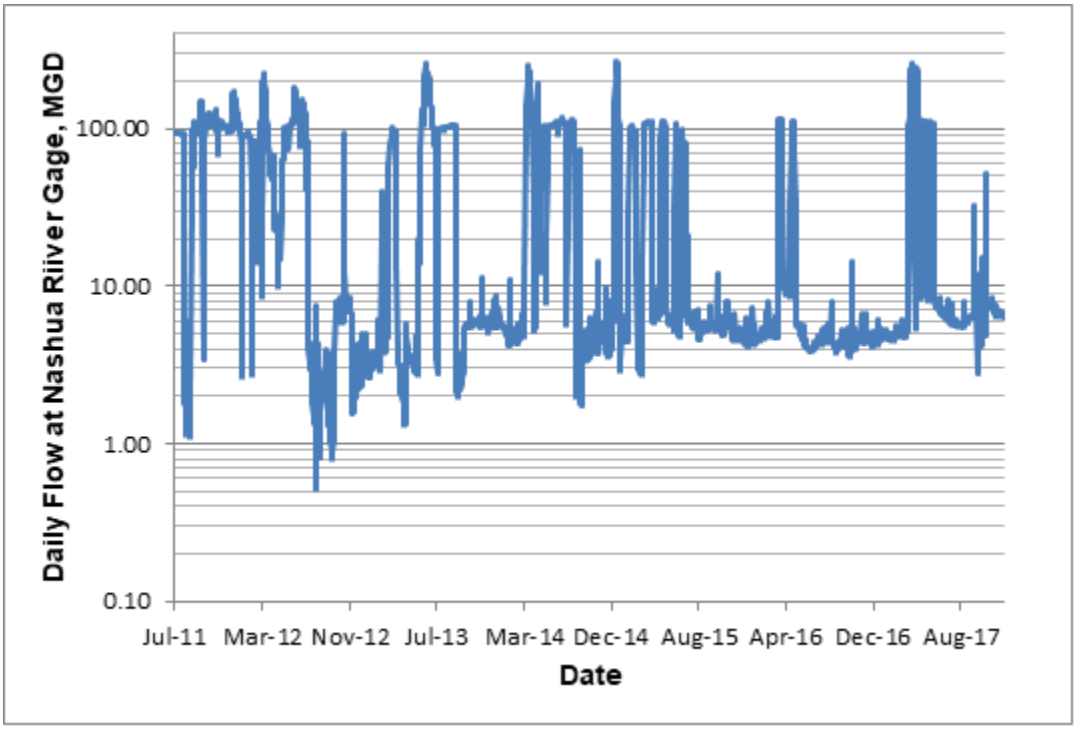


Figure 9 shows a times series of Nashua River flows from the newer USGS Gage 01095503 from July 2011 (when the period of record starts) through 2017. Additional demands from Burlington are not expected to affect Nashua River releases, which represent a majority of the low flows, from the Wachusett reservoir.

Figure 9 Nashua River Flow, MGD, USGS Gage 01095503



While only minimum release requirements apply to the Wachusett Reservoir, data from USGS gages indicate that intermediate flows can occur as a result of releases above the minimum requirement of 12 MGD per week. The additional demand of Burlington will not in itself cause any change in how the Wachusett Reservoir is operated, nor in releases to the Nashua River. Since high flows from the Wachusett Reservoir are generally uncontrolled spills, and the reservoir level is intended to be managed to a narrow range of levels, the proposed Burlington interbasin transfer is not considered to have an impact on high flows in the Nashua River.

Ware River

According to MWRA, the Ware intake at Barre was designed to pass the first 85 MGD before flow can be siphoned into the intake. Flow is measured by MWRA using its own meter at the intake. Low-flow impacts on Ware River diversions as a result of the additional demands posed by Burlington are not expected. Ware River diversions are limited to non-low-flow months (November through May), and to periods when flow exceeds 85 MGD. It is noted that diversions from the Ware River to the Quabbin Reservoir are typically only made when the reservoir level is below normal or the Army Corps of Engineers requests them for flood control.

Previous analysis showed that intermediate flows at the Ware River intake (classified herein between 50 to 100 MGD) occurred 38 percent of the time between 2002 and 2006 (See Figures 10 and 11). During this period, at times when the diversion was activated, up to 85% of Ware River flow was diverted, while maintaining at least the minimum 85 MGD downstream release. For the period analyzed (2002 to 2006), the Ware diversion was operated 184 days, or about 27 percent of the time during the intermediate flows. It is acknowledged that Ware diversions are limited based on MWRA's operating practices. Even with the diversions, however, the frequency and magnitude of intermediate flows in the Ware River appear nearly normal. High flows on the Ware River are impacted by diversions to the Quabbin Reservoir. Previous analysis showed that high flows (above 100 MGD) at the Ware River intake occurred 30 percent of the time between 2002 and 2006. During this period, at times when the diversion was activated, up to 84% of Ware River flow was diverted, while maintaining at least the minimum 85 MGD downstream release. For the period analyzed (2002 to 2006), the Ware diversion was operated only 34 days, or about 6 percent of the time during high flows. As noted previously, Ware diversions are limited based on MWRA's operating practices. Even with the diversions, however, the frequency and magnitude of high flows in the Ware River appears nearly normal. The addition of Burlington will not likely have an impact on the use of Ware River diversions or high flows in the Ware River.

Figure 10 Time Series Ware River Flows, 2002 to 2006

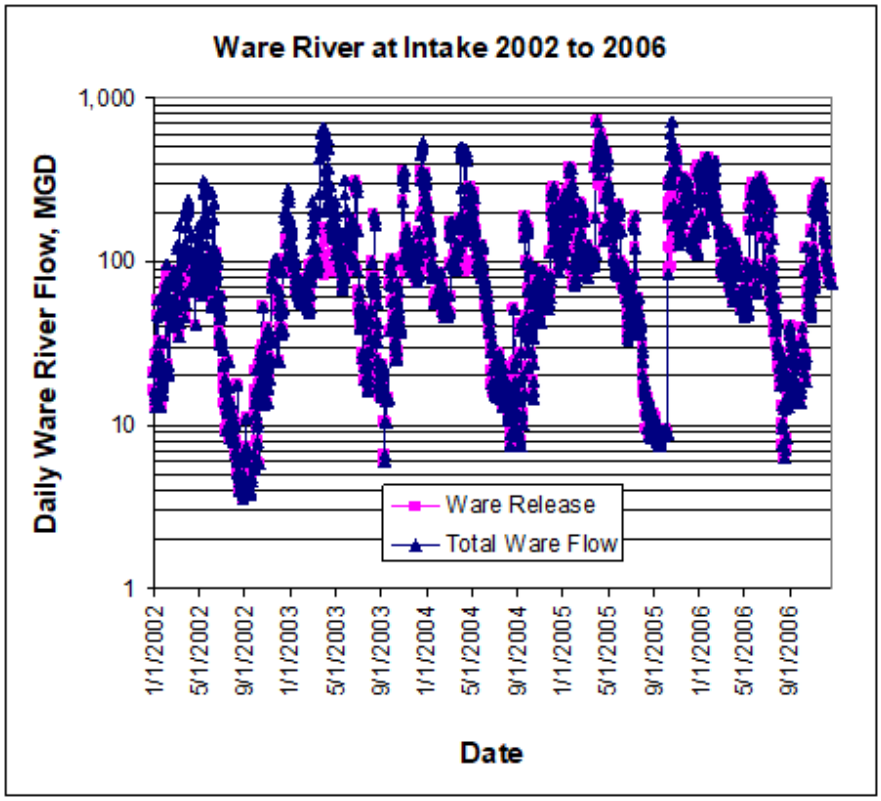
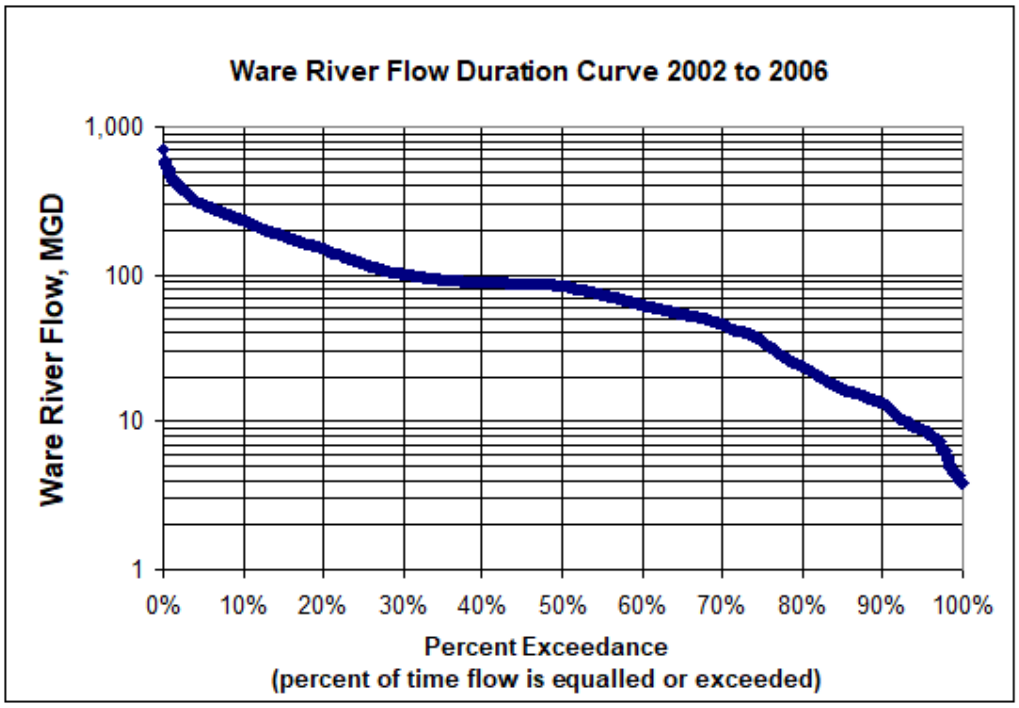


Figure 11 Ware River Flows and Flow Duration Curve, 2002 to 2006



Quabbin Reservoir - Levels & Drought Analysis

Quabbin Reservoir Levels

Figures 12 and 13 show system demand and reservoir elevation levels for the period 1950 through 2018 and 1948 through 2018 respectively.

Figure 12 MWRA Annual Average System Demand 1950- 2018

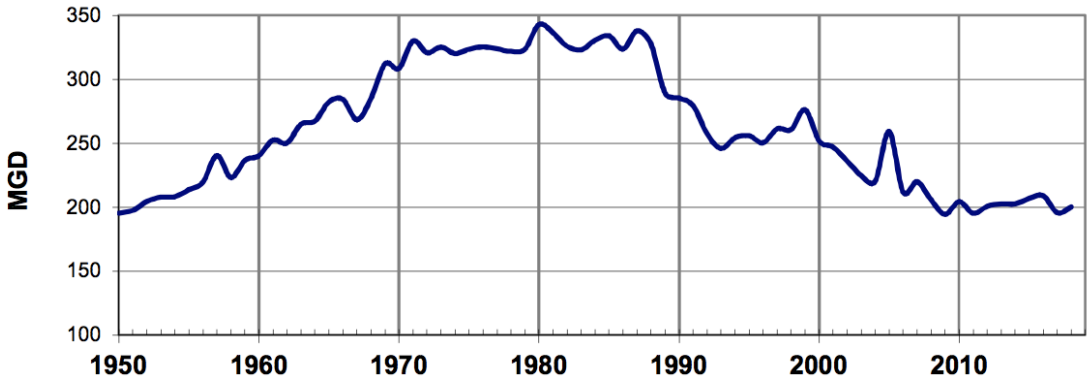
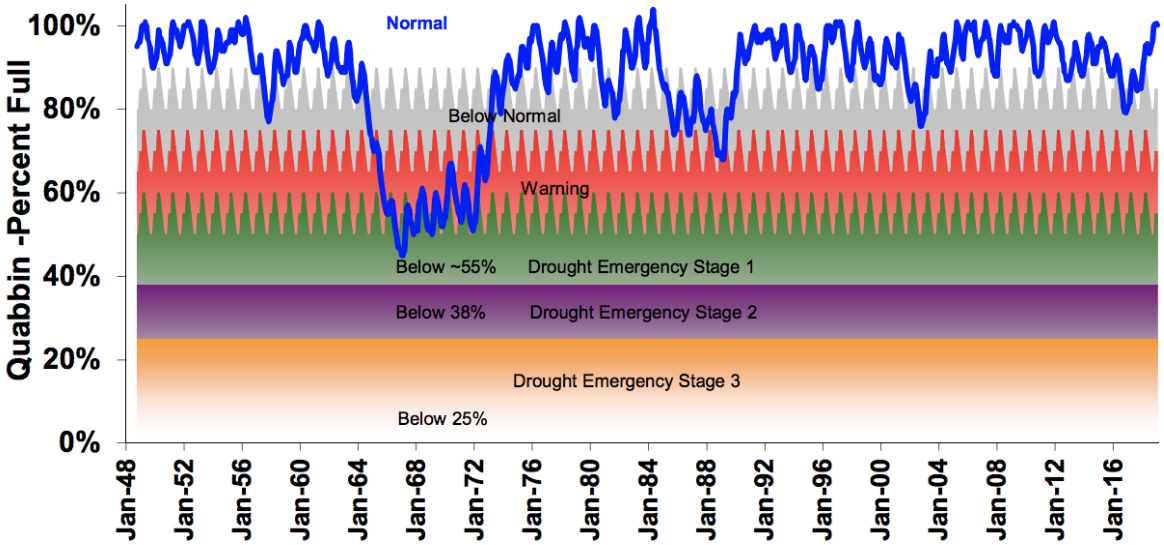


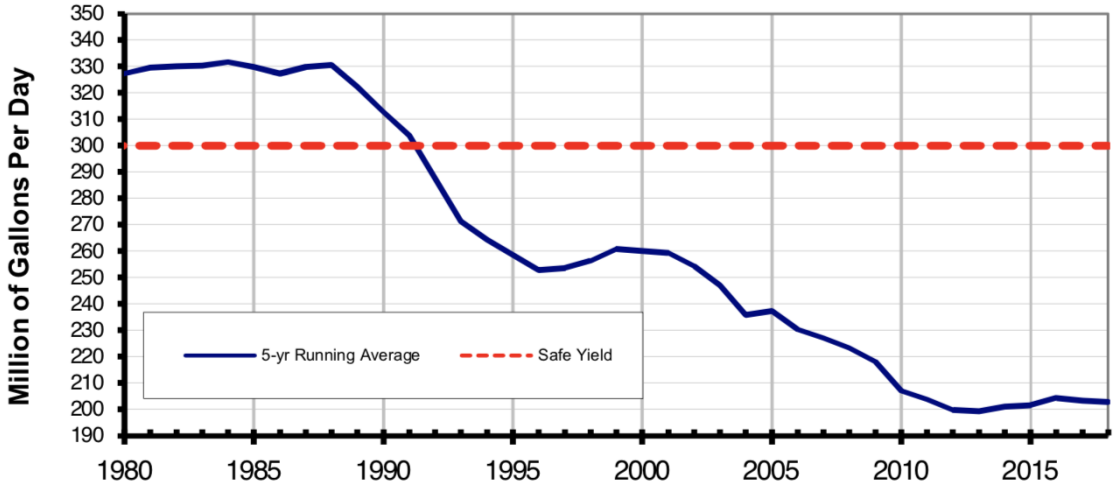
Figure 13 Quabbin Reservoir Levels 1948 – 2018



Quabbin Reservoir Performance - Drought Analysis

The safe yield of the Quabbin /Wachusett/Ware system is approximately 300 MGD. MWRA system demand has decreased since the 1980's. In the DEIR, the baseline demand used for analysis was 203 MGD (5-year average 2013-2018) (See Figure 14).

Figure 14 MWRA Demand Five Year Average 1980 to 2018



Projected 2040 Demand

Residential demand between 2010 and 2040 for water communities typically served by MWRA (which does not include emergency-only communities of Worcester, Leominster, and Cambridge) is projected to increase by approximately 23.6 MGD. It is assumed that new population growth in MWRA's communities, both partially and fully served, would be met by MWRA, not local sources. An additional 5.9 MGD is projected for non-residential demand, for a total of 29.5 MGD. Adding 29.5 MGD to the average annual demand of the MWRA water service area for the five preceding years results in a demand estimate of 233 MGD in 2040, if it is assumed that use of local sources remains roughly the same. To account for potential changes in local sources, an additional demand of 17 MGD was added. The conservative assumption of 17 MGD additional demand from partial and emergency users results in a total projected demand on the existing MWRA system of approximately 250 MGD.

The total projected demand in 2040 of the existing system as calculated above added to the demand from Burlington, Ashland, and other communities that may join MWRA system in the future for a total of up to 10 MGD results in a future demand of 260 MGD in 2040.

MWRA modeled the long-term impacts of demands ranging from 200 to 300 MGD on reservoir performance measures using the historical record 1948-2018, which includes the 1960's drought of record. The performance measures were developed in the 1994 "Trigger Planning Study." The results presented here assume use of MWRA's current operating procedures for the Ware River. All analysis also assumes full compliance with all required releases to the Swift and Nashua Rivers, and a continuation of current system operating practices. The model incorporates "pop-up" demand from MWRA partially supplied and emergency communities including Cambridge and Worcester. The reservoir performance measures used not only assess the ability of the system to satisfy projected demands, but also measure the corresponding impacts on the condition and ecology of Quabbin Reservoir and on the consumers served by the system.

At a demand of 260 MGD, there would be five months spent in drought emergency stage 1 (in addition to 66 months below normal, and 57 months in drought warning (Table 1).

Table 1 Number of Months in Each Stage of MWRA's Drought Management Plan, October 1948 to September 2018 (Including Drought of Record)

Demand (MGD)	Below Normal	Drought Warning	Drought Emergency Stage 1	Drought Emergency Stage 2	Drought Emergency Stage 3
190	22	0	0	0	0
200	33	1	0	0	0
210	44	4	0	0	0
220	50	6	0	0	0
230	59	12	0	0	0
240	62	24	0	0	0
250	74	35	1	0	0
260	66	57	5	0	0
270	68	64	15	0	0
280	80	54	35	0	0
290	120	30	66	0	0
300	161	28	70	9	0

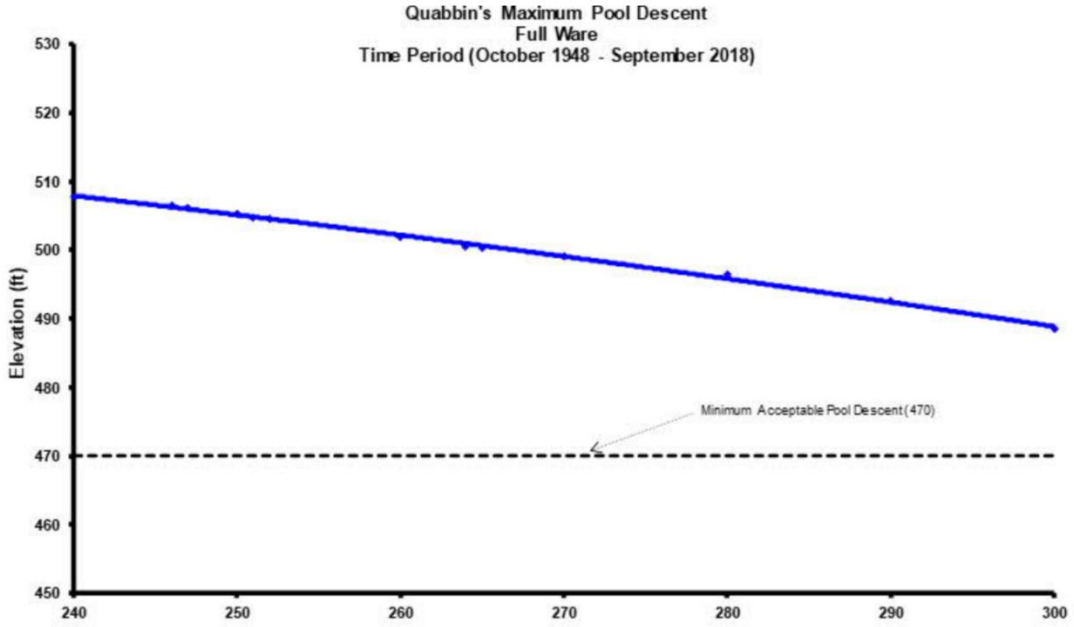
Drought Emergency Stage 1 is when the Quabbin levels are between 38% to 60% and there is a 10% target use reduction with mandatory restrictions (Table 2).

Table 2 MWRA Drought Management Stages

Stage	Trigger Range (Quabbin % Full) [2]	Target Water Use Reduction
Normal	10-100%	0
Below Normal	65-90%	Previous year's use (voluntary)
Drought Warning	50-75%	5% (voluntary)
Drought Emergency Stage 1	38-60%	10% (mandatory restrictions)
Drought Emergency Stage 2	25-38%	15% (mandatory restrictions)
Drought Emergency State 3	Below 25%	30% (mandatory restrictions)

The Quabbin's maximum descent would still be above 500 feet, above the level that performance could be affected and there are water quality concerns (see Figure 15).

Figure 15 Maximum Pool Descent



Varying water demand at the levels associated with Burlington's demand has no impact on MWRA's ability to maintain required minimum stream flows. Whether MWRA system demand is 203 MGD (the baseline demand), 260 MGD (baseline water demand plus growth in the existing service area, potential increased demand of current partial communities, and 10 MGD for Burlington, Ashland and other potential new communities), or 300 MGD (the level of demand in the 1980s), minimum in-stream flows and discharges required by the 1927 Acts of Massachusetts and 1895 Acts of Massachusetts and 1929 War Department permit are met. MWRA's controlled discharges are primarily dictated by statutorily required minimum releases, other operational practices that have been put in place to optimize water supply and water quality, and other environmental initiatives of MWRA. All of the modeling summarized above assumes all mandated releases are made.

Impacts to Flow Characteristics

ITA criteria require evaluating impacts of the transfer on specific flow statistics. No impact to the Swift River 95% flow duration (20.0 MGD) is expected, compared to existing conditions. The 95% flow duration is equivalent to the state-mandated release requirement of 20 MGD at Bondsville. Data from the Swift River gage indicate that the mandated release has been achieved at virtually all times and it is expected that it will be maintained into the future and will not be affected by the proposed transfer or those of future communities included in this analysis.

The 95% flow duration at the Wachusett Reservoir is not likely to be affected by the proposed additional transfers requested by Burlington. Data previously provided by the DCR Office of

Watershed Management and USGS gage data indicate that the mandated release has been achieved at virtually all times since 2002 and it is expected that it will be maintained into the future and not be affected by the proposed transfer.

The 95% flow duration at the Ware River should not be impacted by the proposed increase in interbasin transfer since Ware River diversions are not allowed during low flow periods.

Impacts to Other Uses

Fisheries

The proposed additional withdrawal will have no effect on anadromous fisheries, searun brook and brown trout, smelt and American shad. There are numerous downstream barriers to fish passage on the Swift and Chicopee Rivers, and the Swift River is not a component of the Connecticut River Anadromous Fish Restoration Program.

According to the Massachusetts Division of Fisheries and Wildlife, the Swift River below Winsor Dam, down to the confluence with the Ware River, contains significant fisheries habitat. An instream flow incremental method (IFIM) study of the Swift River in 1997 by Normandeau Associates for MWRA indicated that the current flow releases were adequate to protect the Swift River trout fishery. MWRA and DCR Office of Watershed Management have taken a number of steps to address fisheries issues in the Swift River.

Hydropower

There are no hydropower projects on the Swift River downstream of Winsor Dam. On the Chicopee River, downstream of the Swift River, there is the Red Bridge Dam, the Ludlow Dam, Indian Orchard Dam, Chicopee Falls Dam and Dwight Dam. These Chicopee River hydropower projects are affected by flows from a much greater drainage area than just the Swift above Winsor Dam. These projects would be unaffected by the proposed withdrawal from Burlington, Ashland and other potential new communities for a total of 10 MGD.

Other Instream Uses

There are no ACECs mapped downstream of Quabbin Reservoir or the Ware River. The Central Nashua River Valley ACEC is located downstream of the Wachusett Reservoir but will not be affected by this transfer as current operating procedures and required discharges to the river will not change. There are no designated wild and scenic rivers downstream of the water sources that supply the MWRA system.

Other than the Quabbin Reservoir itself, the only significant wetland in the Chicopee River basin that could be affected by the transfer is in Ware, along the Swift River. The area is 70 acres of open water impounded by a dam in Bondsville. Because this area is open water and is part of the river, current minimum flow requirements appear to be adequate to protect the wetland area.

The current values would not be altered as a result of supplying 10 MGD of water to Burlington, Ashland, and other potential new communities, and no effects on water quality, recreational uses, and aesthetic values are anticipated. The reservoir system will continue to be operated to maximize water quality and will continue to be governed by an operating policy developed and supported by detailed modeling.

Summary of Reasonable Instream Flow Analysis and Cumulative Impacts

The analyses of release data indicate there will be no change in the operation of the Quabbin and Wachusett Reservoirs in response to the proposed Burlington transfer or to other potential transfers up to the 10 MGD used in the analyses of the MWRA Water Works System. Downstream flows will continue to meet all applicable permit and regulatory requirements. Low flows will not change, and intermediate and high flows will possibly only be slightly affected on the Swift and Ware Rivers. Current resources will be unaffected by the transfer. The proposed action to increase the present rate of interbasin transfer will still maintain reasonable instream flow in the donor basins. The WRC recognizes that current conditions represent a highly engineered environment. Modifications to the timing and magnitude of releases to the Swift and Nashua Rivers, previously undertaken, may be beneficial to the downstream aquatic habitat. This Decision attempts to address the balance between water supply needs and aquatic habitat needs of flow, water quality and water temperature in the Swift, Ware, and Nashua Rivers.

Criterion #6: Impacts of Groundwater Withdrawals

MWRA's sources are surface water sources. This Criterion is not applicable to this proposal.

EXECUTIVE ORDER 385

This Decision is consistent with Executive Order 385, which has the dual objective of resource protection and sustainable development. This Decision does not encourage growth in areas without adequate infrastructure nor does it cause a loss of environmental quality or resources.

CONDITIONS FOR APPROVAL

Based on the analyses of this project, the approval of Burlington's application under the ITA to purchase water from MWRA is subject to the following conditions. **Burlington must commit in writing within 45 days of this Decision to abide by all conditions required by the approval of this transfer.**

1. By virtue of claiming that its local groundwater sources are currently not viable at any time for drinking water purposes, and therefore an interbasin transfer from the MWRA is needed to meet the Town's water supply needs, under the ITA Burlington will need to ultimately discontinue the use of its groundwater sources. During Phase 1 of the project, in which 1 MGD will be transferred from MWRA to Burlington through the Town of Lexington, Burlington will still need to rely on the currently active Vine Brook wells and WTP (Wells No. 1, 2, 10, and 11, which produce approximately 1.95 MGD) to meet water supply needs. When Phase 2 is complete, accepted for commissioning by MassDEP and the Town, and the connection to MWRA for the full 6.5 MGD is active, Wells No. 1, 2, 10 and 11 will then be maintained in an inactive ready status to be pumped through the Vine Brook WTP monthly. After the completion of Phase 2, the wells and the Vine Brook WTP will be used for water supply purposes only during a MassDEP-declared emergency.

   If, at a future date, the Town decides to completely remove the wells from service and decommission and demolish the Vine Brook WTP, Burlington must notify the WRC of this change in operations. In addition, in the event that Burlington's local groundwater sources become viable in the future, Burlington must notify the WRC for consideration of

the implications of in-basin water availability on this approval. Burlington must also notify the WRC of any system changes, including those in infrastructure or operation, which could provide the Town the ability to increase its rate of interbasin transfer.

2. Burlington must prioritize the use of its surface water source to the maximum extent possible and may only withdraw the full 6.5 MGD (MDD) from MWRA when the Mill Pond WTP is not available to supply water to the Town due to maintenance, repair needs, or other circumstances. In the future, if Burlington seeks to discontinue use of its Mill Pond WTP and rely solely on the MWRA for its full supply of water, Burlington must notify the WRC regarding the change in viability of its local surface water sources and request and obtain from the WRC appropriate amendments to the final WRC decision to reflect the changed circumstances that its local sources are no longer viable.

3. To attain compliance with Water Conservation Standard #4 - Pricing, Burlington must:
    a. Eliminate the base allocation of 5,000 gallons per annual billing cycle within the secondary residential rate.
    b. Create new tier volumes for the secondary residential rate that more effectively distinguish between efficient and inefficient outdoor usage and send stronger price signals for less efficient use.
    c. Substantially reduce or eliminate the base allocation of 10,000 gallons per quarterly billing cycle for commercial customers.

4. Within the next four years and with updates on progress provided annually, Burlington must move to at least quarterly billing for its primary residential accounts and incorporate one additional billing cycle, mid-irrigation season, to achieve the equivalent of quarterly billing for its secondary residential accounts.

5. To attain compliance with Water Conservation Standard #6 - a drought/emergency contingency plan, the Town must update its drought plan to reflect the changes in water supply sources for both the MWRA sources and the remaining local source(s). Additionally, when updating its drought plan, Burlington should review the 2019 (or most recent) Massachusetts Drought Management Plan and incorporate applicable recommended elements from the state plan into its drought plan. It must also tie its drought plan to the Secretary of EEA's drought declaration as a secondary trigger and incorporate recommended actions by the Secretary of EEA for the Northeast Drought Region.

6. Burlington must continue to regulate nonessential outdoor water use from private wells based on local conditions and state-declared drought status and seek WRC approval prior to making any changes to its Water Supply Conservation bylaw or private well regulations regarding nonessential outdoor water use that would make them less environmentally protective than the current restrictions.

7. To complete compliance with Water Conservation Standard #7 - Municipal Use, Burlington must ensure that its buildings, facilities, and landscapes are using water efficiently both indoors and outdoors. Burlington must use its smart water metering system to analyze existing water-use data to spot trends, patterns, and unexplained

increases that could indicate leaks or inefficient use of water, including monitoring its facilities for leaks and ensuring compliance with water bans at public facilities. Public buildings and facilities that use large amounts of water must be investigated for potential retrofits of fixtures if they are not low flow. Where feasible, use the best available technologies for water conservation for both retrofitted facilities and new construction.

8. To complete compliance with Water Conservation Standard #10 - Industrial, Commercial and Institutional (ICI) Use, Burlington must continue to monitor water use on its metering system for high usage and suspected leaks, and notify the users as needed. The Town must reach out annually to the top 10 users to direct them to EPA's WaterSense website that has information regarding conservation strategies applicable to the top 10 users (such as hotels, restaurants, etc.) to help emphasize the importance of water conservation.

9. To complete compliance with Water Conservation Standard #12 - A long-term water conservation program, Burlington must:
    a. Continue to implement core elements of a Water Loss Control Program to remain at or below 10% UAW and review and revise its Program as needed in accordance with standard industry best management practices. Additional elements of a Water Loss Control Program can be found in the 2018 Water Conservation Standards and EPA guidance. Water Loss Control Strategies can be found in the American Water Works Association guidance on M36 Audits as well as EPA guidance.
    b. Provide annual summaries of progress and make all documents available upon request to WRC staff for review.

10. Burlington must complete the updated WRC Water Conservation Questionnaire to serve as its written water conservation plan and outline how Burlington's program conforms with the 2018 Massachusetts Water Conservation Standards. This questionnaire, updated every five years by Burlington, will reflect its existing program and additional components outlined in conditions 3 and 4 (water rates and billing), condition 5 (drought plan), condition 7 (municipal use), condition 8 (ICI), and condition 9 (water loss control). Burlington must actively continue all water conservation efforts to maintain its rgpcd at or below 65 and its UAW at or below 10%.

11. Burlington must continue to maintain its public education program on water use and conservation through various media, online and other outlets.

12. Burlington must develop a local Surface Water Supply Protection Plan for Mill Pond Reservoir. MassDEP's Drinking Water Program is available to provide GIS maps, guidance and technical assistance. The plan shall include a component on forestry for watershed protection, in the event that Burlington has plans to conduct forestry operations on Town-owned properties. As part of this process, Burlington should work with MassDEP to ensure compliance with 310 CMR 22.20C.