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**
**AvalonBay's Request for an Interbasin Transfer**
**Pursuant to M.G.L. Chapter 21 § 8C**

**May 10, 2007**

DECISION

On May 10, 2007, by a nine to zero (9-0) vote, with one abstention, the Massachusetts Water Resources Commission (WRC) approved the Staff Recommendation concerning AvalonBay Company's request under the Interbasin Transfer Act for a proposed connection to Massachusetts Water Resources Authority (MWRA) Sewerage System through the town of Norwood for a property in Sharon. This vote was taken after review of the facts provided by the applicant, analysis of the associated data, and consideration of comments received concerning this proposal.

INTRODUCTION

On December 4, 2006, the Massachusetts Water Resources Commission (WRC) received a request for approval of an action to increase the present rate of interbasin transfer under the Interbasin Transfer Act (M.G.L. Chapter 21 §§ 8B-8D) from the AvalonBay Company for a connection to Massachusetts Water Resources Authority (MWRA) Sewerage System through the town of Norwood for a property in Sharon. The Interbasin Transfer application was submitted as part of the Notice of Project Change (NPC) for EOEA #13835.

The WRC accepted AvalonBay's application as complete on February 8, 2007 and held two public hearings, as required by the regulations, on March 27, 2007. A Staff Recommendation to approve the proposal was presented to the WRC on April 12, 2007, with an additional public hearing on the Staff Recommendation held on April 24, 2007. Responses to comments received through the public comment period are available in a separate report from the WRC. On April 12, 2007, the WRC discussed the merits of the proposal and the public comments received and on May 10, 2007, the WRC voted to approve this transfer.

FACTS PERTAINING TO THE APPLICATION

1. AvalonBay is proposing to construct a 40B development within the town of Sharon.
2. The development is being co-sponsored by AvalonBay Communities Inc. and the Town of Sharon through the Local Initiative Program.
3. This development will obtain its water supply from the Sharon municipal system. Sharon's water supply sources are located in both the Taunton River basin and the Neponset River subbasin of the Boston Harbor basin.
4. One of the Taunton River subbasins in which Sharon has wells, (Billings Brook, which drains into the Threemile River at North Dighton) has been classified as "medium stress" in the WRC's 2001 Stressed Basin report. The other Taunton subbasin, the Canoe River, is unassessed. The Neponset River subbasin, (Beaver Brook, which drains into the East Branch of the Neponset River) has been classified as "low stress."
5. The development proposes to discharge all of its wastewater to the MWRA system, through the Town of Norwood. The amount of water to be transferred is 16,120 gallons per day (gpd).
6. The MWRA discharges treated wastewater to the Massachusetts Coastal basin.
7. The sewer connection to the Town of Norwood will be owned and operated by AvalonBay and is limited to this development. No additional sewer connections can be made to this line.
8. Two public hearings, as required by the regulations, were held on March 27, 2007. An additional public hearing on the Staff Recommendation was held on April 24, 2007.

DESCRIPTION OF THE PROPOSED SEWER CONNECTION

AvalonBay is proposing to connect to the MWRA sewer system through the Town of Norwood. The development obtained permission from the Massachusetts General Court for this action on October 5, 2006 (Chapter 319 of the Acts of 2006).

The connection will be made via Tiott Street, as the Norwood system extends close to the Sharon town boundary at this location. It is expected that the amount of transfer will be monitored through annual reports submitted to the MWRA, detailing the past year's water usage, based on actual meter readings. In addition, according to the April 11, 2006 agreement between the Town of Norwood and AvalonBay, "The (Norwood) DPW shall have the right to determine, in its reasonable discretion, the method of metering (sewer flows) for the Development."

The connection will be owned and operated by AvalonBay and is limited to this development. The legislation authorizing this connection and AvalonBay's agreements with the Towns of Norwood and Sharon specify that no additional sewer connections can be made to this line. Ownership of the sewer will be deeded with the property. According to the proponent, maintenance of the sewer line will be the responsibility of the property owner, which will provide maintenance staff on the property 24 hours per day. The sewer pump system associated with the privately owned connection will be equipped with an alarm system that will notify AvalonBay of any problems.

EVALUATION OF THE PROPOSED INTERBASIN TRANSFER

This Interbasin Transfer application was reviewed on its own merits. This Decision was made on facts relevant to the Interbasin Transfer Act and its regulations. The application was evaluated against the eight criteria outlined in the regulations (313 CMR 4.05), as well as the Interbasin Transfer Act Performance Standards.

SYNOPSIS OF THE EVALUATION CRITERIA (313 CMR 4.05)

| Criteria | Application Meets? |
|---|---|
| **Criterion #1:** MEPA Compliance | Yes |
| **Criterion #2:** Viable In-Basin Sources | Yes |
| **Criterion #3:** Water Conservation | Yes |
| **Criterion #4:** Forestry Management | Not Applicable |
| **Criterion #5:** Reasonable Instream Flow | Yes |
| **Criterion #6:** Groundwater/Pumping Test | Not Applicable |
| **Criterion #7:** Local Water Resources Management Plan | Not Applicable |
| **Criterion #8:** Cumulative Impacts | Yes |

BASIS FOR THE DECISION

The application was reviewed by the Department of Conservation and Recreation (DCR)'s Office of Water Resources, the Department of Environmental Protection (DEP)'s Boston and Southeast Regional Office (SERO), the Department of Fish and Game (DFG)'s Division of Fisheries and Wildlife, and Riverways Program.

This Decision was made after an extensive evaluation of the project and of AvalonBay Sharon's compliance with the five applicable criteria of the Interbasin Transfer Act regulations. The following section describes how the project complies with the criteria.

**Criterion #1 MEPA Compliance**

An ENF for this project was filed with MEPA in June 2006. At that time, it was thought that the project could request a Determination of Insignificance (RDI) under the ITA. The Secretary's Certificate, issued on August 9, 2006, therefore, did not require an Environmental Impact Report (EIR). WRC staff provided guidance to the proponent on the requirements for a RDI. As the proponent conducted the analyses, it became apparent that some of the very strict criteria of the RDI would not be met. The proponent filed an Notice of Project Change (NPC) with MEPA in November 2006, stating the changed circumstances of the ITA review and requesting a waiver of the EIR. On January 12, 2007, the Secretary issued a Certificate on the NPC, as well as a Draft Record of Decision, waiving the EIR and stating no further MEPA review was necessary. The Final Record of Decision was signed on February 8, 2007.

**Criterion #2 Viable In-Basin Sources**

In 1987, the WRC adopted interpretations for some of the definitions in the Interbasin Transfer Act regulations to clarify how certain criteria would apply to a wastewater transfer. Based on these interpretations, a viable local wastewater source is a cost-effective, technologically feasible, environmentally sound wastewater treatment system that treats and discharges wastewater within the basin of origin, and has been approved by DEP. Such systems can include, but are not limited to, conventional Title 5 systems, groundwater discharge systems, NPDES-regulated surface water discharge systems, alternative/innovative on-site systems or package treatment plants.

In order to evaluate a wastewater transfer against this criterion, "That all reasonable efforts have been made to identify and develop all viable sources in the receiving area", the WRC interpreted "receiving area" to mean "the community(ies) or portion of community(ies) whose wastewater is collected for discharge out of basin via an interbasin transfer". For the purposes of evaluating this project against this criterion, the "receiving area" is the AvalonBay development.

WRC Staff reviewed several memos prepared by the applicant summarizing investigations and providing supporting documentation of investigations that were performed to determine the feasibility of an on-site subsurface disposal system. Subsurface investigations consisted of test pits excavated and logged in September 2002 and in February/March 2004. Results from the test pits completed in 2002 and 2004 identified two areas with potential for subsurface disposal. Further subsurface investigations and additional characterization of these two areas were performed in June and July of 2005. A total of 37 test pits were investigated and a total of 10 borings and monitoring wells were investigated on the site. As a result of the subsurface investigation and analyses, the proponent's engineer recommended that an on-site subsurface disposal system not be pursued.

WRC Staff conferred with DEP staff regarding the technical information submitted. DEP staff agreed that there were areas at the site with potential for subsurface disposal, however they acknowledged that even if it is possible to locate such system on-site, it would be limited. To follow up on this, WRC Staff met with the proponent and the proponent's engineers to review and clarify some questions about the submitted materials. The proponent said that given the marginal subsurface disposal suitability of the site and the engineer's recommendation, the proponent did not want to take the economic risk of a failed on-site system for this project. In addition, two septic systems abutting the property have failed, further raising the question of long-term viability. Although the possibility of an on-site system was not ruled out by the proponent, it was not considered viable for this project. The proponent's engineer subsequently submitted a memo further explaining the recommendation and reasons why the two areas (Figure 1) that did show potential for subsurface disposal are not suitable:

<u>Area in the southeast corner of the site (SAS-2)</u>

Groundwater mounding calculations indicated that 5 to 7 feet of fill would be required for a subsurface disposal system. In order to maintain adequate drainage, adjacent properties would need to be filled. In addition, required set backs from the wetlands and property lines severely limit the area available for installation.

Download PDF Figure 1 (3MB)

Area in the western portion of the site (SAS-1)

The second area is within the area of proposed development. Groundwater mounding calculations performed indicated that the required fill would result in a finished grade 12-feet above existing grades, presenting issues with the development layout. Set backs from the buildings and drainage systems for the building foundations further limit the area. The suitable soils are bounded by test pits showing unsuitable soils, which place restrictions on the site and eliminates the possibility of modification or expansion should unsuitable conditions arise. The adjacent unsuitable soils also prevent the expansion of the system to alleviate the groundwater mounding and grading issues. In addition, this area is near an area where "breakout" of groundwater has been observed in the slope leading to the wetland, indicating that there is natural tendency for flow to that location. The location and depth to permeable soils also indicates a groundwater regime that functions as a "bath tub" presenting another design concern.

The engineer's conclusion was that although there are two possible areas, they are not viable because:

- the severe soil and physical restrictions of the site
- the groundwater flow characteristics of the site
- the lack of alternative on-site areas or off-site disposal options if the system should fail; there are no alternative areas on-site for disposal and no municipal sewer is available in Sharon.
- the history of failed septic systems in the area
- the high cost and risk should the system fail for the 158 units

Given the scope of issues, the WRC concurs that an on-site system is not viable for this project. The availability of suitable soils for an on-site system is very limited. The physical constraints of the site (the site is 28.8 acres of which approximately is 1/3 wetland), with required setbacks from the wetlands, property lines, and proposed buildings also limit the area available for an on-site system. Additional issues include the economic risk, questionable long-term viability, and the lack of alternative waste disposal, if an on-site system should fail.

**Criterion #3 Water Conservation**

In order to evaluate a wastewater transfer against this criterion, "That all practical measures to conserve water have been taken in the receiving area ...", in 1987, the WRC interpreted "receiving area" to mean "the community(ies) or portion of community(ies) whose wastewater is collected for discharge out of basin via an interbasin transfer." For the purposes of evaluating this project against this criterion, the "receiving area" is the AvalonBay development.

The WRC further required that in the case of wastewater, a practical measure to conserve water should include an I/I removal program.

Because this project is a private residential development, rather than a municipal sewer expansion, many of the wastewater Performance Standards for this criterion do not directly apply, however, AvalonBay will be required to fund inflow removal at a four to one level as a condition of entry into the MWRA sewerage system. Norwood will use the funding to disconnect sump pumps in the Hawes Brook section of town. Approximately 64,000 gpd of inflow will be removed by this program.

In addition, the developer will construct a storm water recharge system in accordance with DEP guidelines to insure that pre-development levels of recharge are maintained.

In order to minimize water use at the site and the amount of wastewater transferred, the proponent will be implementing water conservation measures, which meet or exceed the ITA Performance Standards for Water Conservation. These include:

- Use of low flow plumbing fixtures consistent with the State Plumbing code and ITA Performance Standards for a water supply transfer.
- Installation and use of low flow washing machines.
- Water submetering (i.e. each unit will be metered). Residential water use should be between 55 gpd/bedroom and 65 gpd/bedroom, based on other similar developments operated by AvalonBay.
- Installation of a non-potable water supply for irrigation.
- Use of drought tolerant, non-invasive species and restriction of the amount of turf in the landscape to minimize the need for irrigation. According to the proponent, only about 6% of the site will be irrigated.
- Rain sensors and a weather monitoring component will be installed with the site's irrigation system. According to information provided by the proponent, the weather monitoring device will use current weather conditions and evapotranspiration data to assure that watering only occurs when actually needed.
- Furnishing residents with water conservation educational material program.
- Limiting the amount of impervious surfaces and limiting development, to the maximum extent possible, to existing disturbed areas.

In addition, the WRC strongly urges the project proponent to adopt additional water conservation measures, as suggested by comments made regarding this project, in order to minimize the transfer of wastewater out of basin.

**Criterion #4 Forestry Management**
This criterion is not applicable to a wastewater transfer.

**Criterion #5 Reasonable Instream Flow**
The AvalonBay development in Sharon is proposing to discharge 16,120 gpd from the Taunton and Neponset River basins to the Massachusetts Coastal Basin, via a connection to the MWRA sewer system through the Town of Norwood. Water supply will be furnished by the Town of Sharon, which obtains its water from six wells located in three headwater sub-basins: Canoe River and Billings Brook (Taunton River Basin), and Beaver Brook (Neponset River Basin), shown on Figure 2. As a result of Sharon's well operations approximately 65% (10,575 gpd) of the water will come from the Neponset Basin and 34.4% (5,545gpd) will come from the Taunton Basin.

For analysis of the impact of the proposed transfer, points downstream of Sharon's wells were chosen. Points on the Canoe River and Billings Brook were selected where they cross the Sharon town line and a point on Beaver Brook just upstream from the confluence with Massapoag Brook was selected (Figure 2). The areas of the Canoe River and Billings Brook

**Download PDF Figure 2 (3MB)**

upstream from the analysis points were added together to determine the impacts on the Taunton River Basin. Streamflow records from the USGS gaging stations on the Neponset River at Canton, MA and the Wading River at Norton, MA were used for analysis. About 40 years of daily discharge records for the Wading River (1966-2005) and 50 years of daily discharge records for the Neponset River (1954-2004) were used for analysis. Drainage areas of the sub-basins and the USGS gaging stations are shown in Table 1. The gaging station data was pro-rated according to drainage basin area to create a synthesized daily discharge record for the two sub-basins. The mean daily discharge that would result from the proposed transfer was calculated by subtracting the requested transfer amounts from the synthesized discharge data.

As stated, it was originally thought that the project could request a Determination of Insignificance (RDI) under the ITA. However, the percent reductions in flow as calculated did not meet the stringent criteria of the Act for an RDI, "that the additional flow to be withdrawn is in all cases less than five percent (5%) of the instantaneous flow as measured at an appropriate point of the donor river or tributary thereto." (313 CMR 4.04(4)(c)). For the periods of record, there were 50 days out of 40 years in the Taunton River and 51 days out of 50 years in Neponset River Basin analysis when this 5% criterion was not met and 7 and 12 days, respectively, when a 10% reduction in flow occurred. A summary of the streamflow reductions resulting from the proposed transfer are shown in Table 2. Figure 3 shows hydrographs of existing and proposed reduced flows for a period of very low stream-flow in July through September 1965, a period considered to be the drought of record. The greatest single-day reduction in flow was 10.7% and 21.9% in the Taunton and Neponset River Basins, respectively. Table 3 shows the impact of the proposed transfer on the 95% Exceedance Flows.

Because of the small sub-basin sizes in the reaches above the points of analyses, flows are very sensitive to the proposed transfer during periods of naturally low streamflow. The analysis is based on data from a downstream gage and indicates that even in the lowest period of record, streamflow will be maintained and will exceed about 0.11 cfs (50 gpm) and 0.28 cfs (125gpm) in the Taunton and Neponset River sub-basins. Ninety-five percent of the time the proposed transfer will be less than 1.3% and 2.2% of the total discharge from the Taunton and Neponset River sub-basins. However, anecdotal evidence indicates that some upper reaches of Beaver Brook may dry up during periods of low streamflow.

Based on the analysis performed for this transfer, the WRC concludes that reasonable instream flows will be maintained, however, the Town of Sharon, as the water withdrawer, may be contributing to streamflow depletion in the upper reaches of these sub-basins. Sharon is subject to the Water Management Act and any permit issued for the Town is expected to require town-wide conservation measures during low flows, which should mitigate the impacts of this transfer.

**Criterion #6 Groundwater/Pumping Test**
This criterion is not applicable to a wastewater transfer.

**Criterion #7 Local Water Resources Management Plan**
This criterion is not applicable to the AvalonBay Sharon project.

## Table 1. Summary of data used for analysis to determine impact of water use at Avalon Sharon development in Sharon, MA on streamflow

| Stream/ River Basin (Station used for analysis) | Area at Gaging Station in square miles | Drainage Area at Point of Analysis | Prorating Value |
|---|---|---|---|
| Beaver Brook (01105500)[1] | 27.2 | 3.4 | 12.5% |
| Billings Brook/Canoe River (0110900)[2] | 43.3 | 5.8 | 13.4% |

1. 01105500 ---- USGS Stream Gage -- East Branch Neponset River at Canton, MA
2. 01109000 ---- USGS Stream Gage -- Wading River at Norton, MA

## Table 2. Streamflow reductions resulting from proposed water use at Avalon Sharon development in Sharon, MA

| Basin (station used for analysis) | Years of Data (number of days) | 5% Streamflow Reduction in Days (%) | 10% Streamflow Reduction in Days (%) | >20% Streamflow Reduction in Days (%) | Maximum Reduction in % (date) |
|---|---|---|---|---|---|
| Beaver Brook (01105500)[1] | 1/1954 to 9/2004 (18,536) | 51 days (0.28%) | 12 days (0.07%) | 3 days (0.02%) | 21.87 (7/7/57) |
| Billings Bk/Canoe R.(0110900)[2] | 1/1996 to 9/2005 (14,883) | 50 days (0.34%) | 7 days (0.05%) | 0 days (0.00%) | 10.70 (8/31/93) |

3. 01105500 ---- USGS Stream Gage -- East Branch Neponset River at Canton, MA
4. 01109000 ---- USGS Stream Gage -- Wading River at Norton, MA

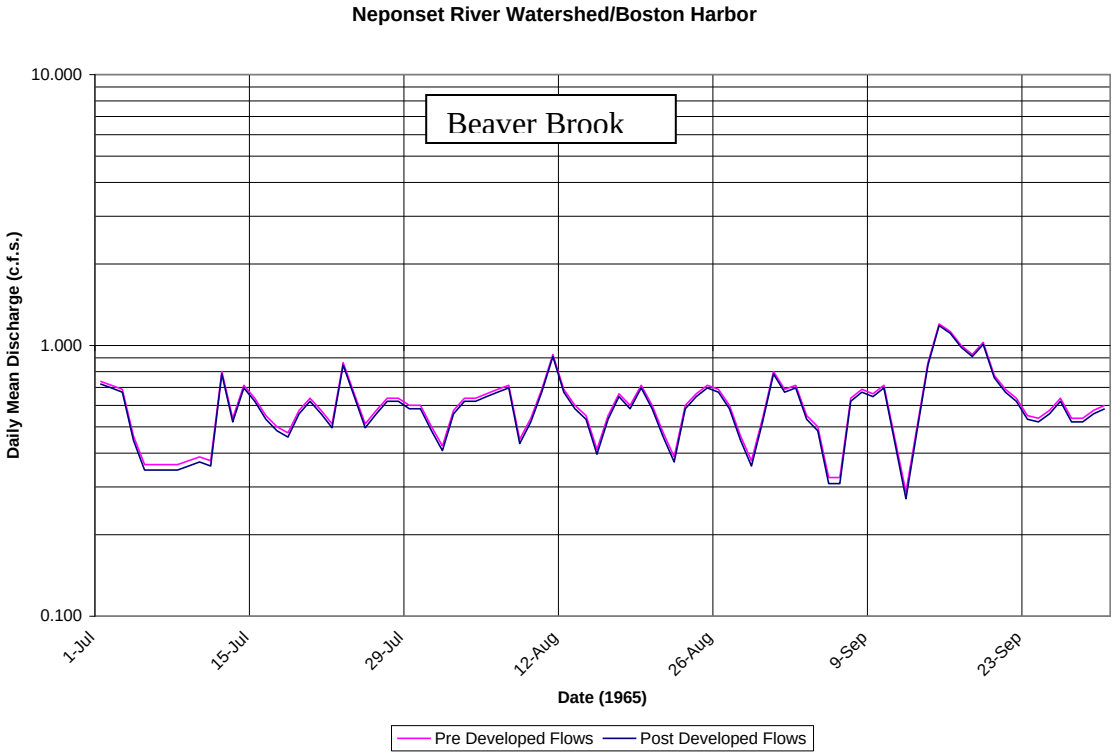
## Table 3. Projected 95 Percent Exceedance Flows in streams impacted by water use at proposed Avalon Sharon development in Sharon, MA

***1 Cubic Foot Per Second (CFS) = 449 Gal/Min***

| Stream Basin | 95% Exceedance Flow in CFS | Avalon Sharon Daily Water Use in CFS | Avalon Sharon Percent of 95% Exceedance Flow |
|---|---|---|---|
| Beaver Brook[1] | 0.74 CFS | 0.016 CFS | 2.2% |
| Billings Brook and Canoe River[2] | 0.56 CFS | 0.009 CFS | 1.3% |

[1] Flow statistics calculated from USGS stream gage 01105500 – East Branch Neponset River at Canton, MA

[2] Flow statistics calculated from USGS stream gage 01109000 – Wading River at Norton, MA.



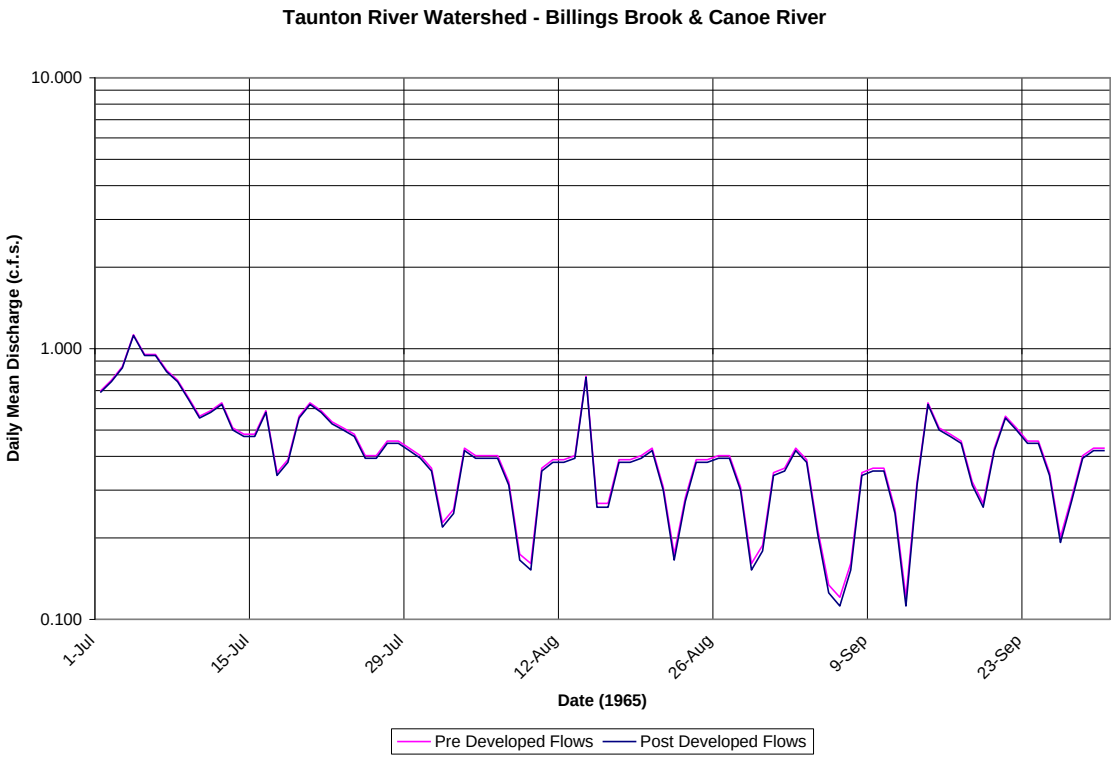




Figure – Hydrographs showing flow reductions resulting from increased withdrawals to supply proposed Avalon Sharon development in Sharon, MA

**Criterion #8 Cumulative Impacts**
All of the subbasins analyzed through this review are impacted to some degree by water supply withdrawals from Sharon's wells. There is some evidence suggesting that the analysis of flow conditions may overestimate flow in the Beaver Brook watershed (flows may be lower than presented) and there may be some stream reaches above the point of analyses, in the headwater tributaries, that go dry during low flow periods. However, the impacts of this project will probably only be felt during extremely low flow periods and should be mitigated by water conservation restrictions imposed town-wide. It should be noted that the impacts of water withdrawals will be unaffected by this wastewater interbasin transfer because the AvalonBay development is not located in the subbasins where Sharon's water supply wells are located. Therefore the WRC recommends that DEP pay careful attention to the flow conditions in these subbasins when issuing or renewing Water Management Act permits to assure a high degree of environmental protection.

OTHER ISSUES CONSIDERED
The use of ultra-low flow toilets in the AvalonBay development was discussed by many commenters and has been addressed by the proponent and the Town of Sharon. Sharon has an ordinance which requires installation of ultra-low flow toilets in new developments. AvalonBay has been working with the Town on water conservation issues. The parties mutually agreed to install low-water use washing machines, in lieu of installation of ultra-low flow toilets, in this development. AvalonBay has stated that it would prefer not to use ultra-low flow toilets in its developments based on consumer preference. It will install 1.6 gallon per flush toilets, which meet both the ITA Performance Standards and the State Plumbing code. Eric Hooper, Superintendent of Public Works for the Town of Sharon, stated in his comments on the application, that the town believed that the use of low-water use washing machines will conserve more water at this development than the installation of ultra-low flow toilets.

The WRC acknowledges that AvalonBay's conservation proposals for this development meet, and in some cases go beyond, the ITA Performance Standards. However, we suggest that the developer pilot a few units with ultra-low flow toilets, to gauge consumer acceptance.

EO 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 OF THE DECISION
Based on the analyses and concerns expressed about this project, approval of AvalonBay's application under the Interbasin Transfer Act for a connection to the MWRA Sewerage System, is subject to the following conditions. AvalonBay must commit in writing to abide by these conditions.

1. AvalonBay must provide copies of the annual reports to be submitted to the MWRA to WRC Staff, detailing the past year's water usage and thus wastewater flows to the sewer. If

an alternative means to monitor the transfer is implemented, AvalonBay must consult with WRC Staff to determine alternate reporting requirements.

2. A maintenance plan for the privately-owned sewer infrastructure must be developed and submitted to the WRC for review and approval, before the development can begin transferring wastewater to the MWRA.
3. AvalonBay must continue to implement the water conservation measures outlined in its ITA application for the life of the project. A report must be furnished to WRC Staff upon completion of construction of the development, documenting the low water use fixtures installed. The WRC may inquire periodically as to the status of these fixtures after the project has been built.