Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

June 11, 2024

Dartmouth Select Board
Dartmouth Town Hall
400 Slocum Road
Dartmouth, MA 02747

RE: Dartmouth – BRP/WMA
Dartmouth Department of Public Works
PWS ID #4072000
Water Management Act Permit Renewal
Permit #9P2-4-24-072.01

Dear Select Board Members,

Attached please find:

- Findings of Fact in support of the renewal of Permit #9P2-4-24-072.01, and
- Renewed Water Management Act Permit #9P2-4-24-072.01 for the Dartmouth Department of Public Works.

The signature on this cover letter indicates formal issuance of the attached documents. If you have any questions regarding this information, please contact Jen D'Urso via e-mail at jen.durso@mass.gov.

Sincerely,

Duane LeVangie

Duane LeVangie, Chief
Water Management Act Program
Bureau of Resource Protection

Ecc: Timothy Barber, Dartmouth Department of Public Works
Steven M. Sullivan, Superintendent, Dartmouth Water and Sewer Division
Dartmouth Conservation Commission
Maura Callahan, Callahan Consulting
Doug DeNatale, AECOM
Eileen Feeney, Massachusetts Division of Marine Fisheries
Anne Carrol, DCR OWR

Jen Pederson, MWWA
Julia Blatt, MA Rivers Alliance
Buzzards Bay Coalition, Board of Directors

https://massgov.sharepoint.com//:f:/r/sites/DEP-BWR/DWPArchive/SERO/2024/Dartmouth-4072000-Final Permit Renewal-9P2-4-24-072.01-6-11-2024

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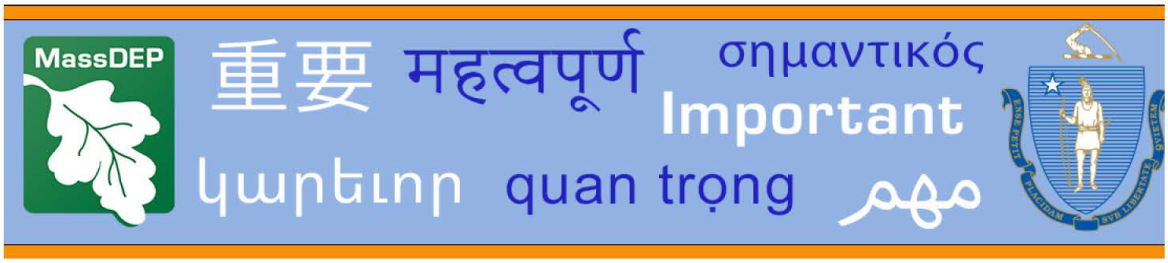

Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

If you need this document translated, please contact MassDEP's Director of Environmental Justice at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido inmediatamente. Si necesita traducir este documento, póngase en contacto con el Director de Justicia Ambiental de MassDEP (*MassDEP's Director of Environmental Justice*) en el número de teléfono que figura más abajo.

Português Portuguese

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繁體中文 Chinese Traditional

本文檔很重要，需要即刻進行翻譯。
如需對本文檔進行翻譯，請透過如下列示電話號碼與 MassDEP 的環境司法總監聯絡。

简体中文 Chinese Simplified

这份文件非常重要，需要立即翻译。
如果您需要翻译这份文件，请通过下方电话与 MassDEP 环境司法主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa a enpòtan epi yo ta dwe tradui l imedyatman. Si w bezwen tradui dokiman sa a, tanpri kontakte Direktè. Jistis Anviwònmantal MassDEP a nan nimewo telefòn ki endike anba a.

Việt Vietnamese

Tài liệu này và quan trọng và phải được dịch ngay. Nếu quý vị cần bản dịch của tài liệu này, vui lòng liên hệ với Giám Đốc Phòng Công Lý Môi Trường của MassDEP theo số điện thoại được liệt kê bên dưới.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះមានសារៈសំខាន់
ហើយគប្បីត្រូវបានបកប្រែភ្លាមៗ.
ប្រសិនបើអ្នកត្រូវការអោយឯកសារនេះបកប្រែ
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MassDEPតាមរយៈលេខទូរស័ព្ទដែលបានរាយដូចខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Es dokumentu sta important i tenki ser tradusidu immediatamenti. Se nho ta presisa ke es dokumentu sta tradisidu, por favor kontata O Diretor di Justisia di Environman di DEP ku es numero di telifoni menxionadu di baixo.

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это чрезвычайно важный документ, и он должен быть немедленно переведен. Если вам нужен перевод этого документа, обратитесь к директору Департамента экологического правосудия MassDEP (MassDEP's Director of Environmental Justice) по телефону, указанному ниже.

العربية Arabic

هذه الوثيقة مهمة وتجب ترجمتها على الفور.

إذا كنت بحاجة إلى ترجمة هذه الوثيقة، فيرجى الاتصال بمدير العدالة البيئية فيMassDEP على رقم الهاتف المذكور أدناه.

한국어 Korean

이 문서는 중대하므로 즉시 번역되어야 합니다.
본 문서 번역이 필요하신 경우, 매사추세츠 환경보호부의 "환경정의" 담당자 분께 문의하십시오. 전화번호는 아래와 같습니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է, և պետք է անհապաղ թարգմանել այն:
Եթե Ձեզ անհրաժեշտ է թարգմանել այս փաստաթուղթը, դիմեք Մասաչուսեթսի շրջակա միջավայրի պահպանության նախարարության (MassDEP) Բնապահպանական հարցերով արդարադատության ղեկավարին (Director of Environmental Justice)՝ ստորև նշված հեռախոսահամարով

فارسی Farsi Persian

این نوشتار بسیار مهمی است و باید فوراً ترجمه شود.
اگر نیاز به ترجمه این نوشتار دارید لطفاً با مدیر عدالت محیط زیستی MassDEP در شماره تلفن ذکر شده زیر تماس بگیرید.

Français French

Ce document est important et doit être traduit immédiatement. Si vous avez besoin d'une traduction de ce document, veuillez contacter le directeur de la justice environnementale du MassDEP au numéro de téléphone indiqué ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und muss sofort übersetzt werden. Wenn Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an MassDEP's Director of Environmental Justice *(Direktor für Umweltgerechtigkeit in Massachusetts)* unter der unten angegebenen Telefonnummer.

Ελληνική Greek

Το έγγραφο αυτό είναι πολύ σημαντικό και πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του εγγράφου αυτού, παρακαλώ επικοινωνήστε με τον Διευθυντή του Τμήματος Περιβαλλοντικής Δικαιοσύνης της Μασαχουσέτης στον αριθμό τηλεφώνου που αναγράφεται παρακάτω

Italiano Italian

Questo documento è importante e deve essere tradotto immediatamente. Se hai bisogno di tradurre questo documento, contatta il Direttore della Giustizia Ambientale di MassDEP al numero di telefono sotto indicato.

Język Polski Polish

Ten dokument jest ważny i powinien zostać niezwłocznie przetłumaczony. Jeśli potrzebne jest tłumaczenie tego dokumentu, należy skontaktować się z dyrektorem ds. sprawiedliwości środowiskowej MassDEP pod numerem telefonu podanym poniżej.

हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका अनुवाद तुरंत किया जाना चाहिए। यदि आपको इस दस्तावेज का अनुवाद कराने की जरूरत है, तो कृपया नीचे दिए गए टेलीफोन नंबर पर MassDEP के पर्यावरणीय न्याय निदेशक से संपर्क करें।

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
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Findings of Fact in Support of Final Permit Renewal
Water Management Permit #9P2-4-24-072.01
Dartmouth Department of Public Works

The Department of Environmental Protection (the Department or MassDEP) makes the following Findings of Fact in support of the attached Renewed Water Management Act (WMA) Permit #9P2-4-24-072.01 and includes herewith its reasons for issuing the Renewed Permit and for conditions of approval imposed, as required by M.G.L. c. 21G, § 11. The issuance of this renewed permit is in response to a water withdrawal permit renewal application by the Dartmouth Department of Public Works, (Dartmouth) for the purpose of public water supply.

The Permit Extensions

WMA permits issued during the first 20-year permitting cycle for the Buzzards Bay Basin were scheduled to expire on May 31, 2011. The expiration dates for all Water Management permits were extended for four years by Chapter 240 of the Acts of 2010 as amended by Chapter 238 of the Acts of 2012, collectively known as the Permit Extension Act. All permittees seeking to renew their Water Management permit in the Buzzards Bay Basin were required to file a renewal application on or before May 31, 2015.

Dartmouth filed a timely renewal application for their Water Management permit on May 19, 2015. Subsequently, in a letter of March 28, 2016, MassDEP informed Dartmouth that MassDEP would need additional time before making a determination on the application in order to ensure that all permit renewal applicants in the Buzzards Bay Basin fully understood the new Water Management Regulations (discussed below), and to give proper consideration to all permit renewal applications within the basin. Pursuant to M.G.L. c. 30A, § 13, and 310 CMR 36.18(7), Dartmouth's permit, including the 2020 permit amendment, continues in force and effect until the Department issues a final decision on the permit renewal application.

In accordance with 310 CMR 36.17(1), the expiration date for all renewed permits going forward in the Buzzards Bay Basin will be September 4, 2032, to restore the staggered permitting schedule in the regulations.

The Water Management Act (M.G.L. c. 21G)

In accordance with the requirements of the Water Management Act (Act), MassDEP has adopted regulations establishing criteria and standards for obtaining permits that, at a minimum, consider the following factors:

- Impact of the withdrawal on other water sources;
- Water available within the safe yield of the water source;

- Reasonable protection of water uses, land values, investments and enterprises that are dependent on previously allowable withdrawals;
- Proposed use of the water and other existing or projected uses of water from the water source;
- Municipal and Massachusetts Water Resources Commission (WRC) water resource management plans;
- Reasonable conservation consistent with efficient water use;
- Reasonable protection of public drinking water supplies, water quality, wastewater treatment capacity, waste assimilation capacity, groundwater recharge areas, navigation, hydropower resources, water-based recreation, wetland habitat, fish and wildlife, agriculture, flood plains; and
- Reasonable economic development and job creation.

Water Management Regulation Revisions

In 2010 the Executive Office of Energy and Environmental Affairs (EEA) convened the Sustainable Water Management Initiative (SWMI) for the purpose of incorporating the best available science into the management of the Commonwealth's water resources. SWMI was a multi-year process that included a wide range of stakeholders and support from the Departments of Environmental Protection, Fish and Game, and Conservation and Recreation. In November 2012 the *Massachusetts Sustainable Water Management Initiative Framework Summary* (http://www.mass.gov/eea/docs/eea/water/swmi-framework-nov-2012.pdf) was released.

On November 7, 2014, the Department adopted revised Water Management Regulations at 310 CMR 36.00 that incorporate elements of the SWMI framework and the Water Conservation Standards adopted by the Massachusetts WRC. The regulations reflect a carefully developed balance to protect the health of Massachusetts' water bodies while meeting the needs of businesses and communities for water.

Without limitation and in accordance with the Act, 310 CMR 36.00 and other relevant regulations, the Department has incorporated the following into Water Management permitting:

- Safe yield determinations for the major river basins based on a new methodology developed through SWMI (see the Safe Yield in the Buzzards Bay Basin section of this document);
- Water needs forecasts for public water suppliers developed by the Department of Conservation and Recreation, Office of Water Resources (DCR), using a methodology reviewed and approved by the Massachusetts WRC;
- Water supply protection measures for public water supplies including Zone II delineations for groundwater sources, and wellhead and surface water protection measures as required by Massachusetts Drinking Water Regulations (310 CMR 22.00);
- Water conservation and performance standards reviewed and approved by the WRC in July 2018 (https://www.mass.gov/massachusetts-water-conservation-standards), including without limitation;
    - performance standard of 65 residential gallons per capita day or less;
    - performance standard of 10% or less unaccounted-for-water;
    - seasonal limits on nonessential outdoor water use; and
    - a water conservation program that includes leak detection and repair, full metering of the system and proper maintenance of the meters, periodic review of pricing, and education and outreach to residents and industrial and commercial water users.

Safe Yield in the Buzzards Bay Basin

This permit is being issued under the safe yield methodology adopted by the Department on November 7, 2014 and described in the regulations at 310 CMR 36.13. As of the date of issuance of this permit, the

safe yield for the Buzzards Bay Basin is 148.4 million gallons per day (MGD), and total registered and permitted withdrawals are 83.78 MGD. The maximum withdrawals that will be authorized in this permit will be reduced by 0.14 MGD from the volume authorized in the prior permit. This reduced volume, and all other permits currently under review by the Department within the Buzzards Bay Basin, will be within the safe yield and may be further conditioned as outlined in the regulations.

Findings of Fact for Permit Conditions in Dartmouth's Water Management Act Permit

Dartmouth operates eleven (11) permitted sources and three registered sources in the Buzzards Bay Basin. Dartmouth was issued its initial Buzzards Bay Basin Water Management Permit on June 5, 1992. In July of 2012, Dartmouth applied to MassDEP for a permit amendment to add the Panelli Well #3 and Panelli wellfield to its WMA permit. In October of 2013, a new permit was issued adding those wells. The modifications to the permit included changing Dartmouth's unaccounted for water (UAW) performance standard from 15% to 10% and the residential gallons per capita day (RGPCD) performance standard from 80 gallons per day (gpd) to 65 gpd and adding the requirement to implement seasonal limits on nonessential outdoor water use based on streamflow in the Paskamanset River.

Dartmouth submitted a Water Management Act (WMA) permit amendment application for withdrawals from the proposed new Violetta Wells (TW 91-17 and TW 97-17) on September 26, 2019. Dartmouth filed an Environmental Notification Form (ENF) for the proposed new Violetta Wells and received a Certificate from the Executive Office of Energy and Environmental Affairs (EEA) on December 6, 2019 and the project received New Source Approval from DEP's Drinking Water Program in a letter dated January 30, 2020. MassDEP issued an Order to Complete to Dartmouth on January 28, 2020, and Dartmouth responded on March 24, 2020. An amended permit was issued on September 16, 2020, for the two new wells. Dartmouth did not request an increase in their system-wide authorized withdrawal volumes with that amendment but instead sought to replace three existing wells with the two new sources.

The following Findings of Fact for the special conditions included in the permit generally describe the rationale and background for each special condition in the permit. This summary of permit special conditions is not intended to, and should not be construed as, modifying any of the permit special conditions. In the event of any ambiguity between this summary and the actual permit conditions, the permit language shall control.

Special Condition 1, Maximum Authorized Annual Average Withdrawal

Dartmouth is currently registered for 1.16 million gallons per day (MGD) with a permit that includes an additional allocation of 2.11 MGD, for a total authorized average daily withdrawal volume of up to 3.27 MGD (1,193.55 Million Gallons per Year (MGY)). This volume will be reduced to 3.13 MGD as requested in Dartmouth's renewal application. Table 1 summarizes Dartmouth's WMA Authorizations:

TABLE 1: Dartmouth Department of Public Works WMA Authorizations	
WMA Authorization	**Volume Authorized**
WMA Permit #9P2-4-24-072.01	1.97 MGD (719.05 MGY)
WMA Registration #4-24-072.02	1.16 MGD (423.40 MGY)
Total WMA Authorization	3.13 MGD (1142.45 MGY)

Dartmouth may potentially withdraw an annual average daily volume of up to 3.13 MGD from the Buzzards Bay Basin. This volume is further limited by the Direct Mitigation achieved to date, compliance with the permits Special Conditions, and the need to evaluate direct mitigation in the future

(See Special Condition #13- Mitigation Requirements). In 2022, Dartmouth's average daily raw water withdrawal from the Buzzards Bay Basin was 1.37 MGD. In addition, Dartmouth purchased an average volume of 1.21 MGD from New Bedford, which contributed to a finished average daily use of 2.49 MGD. If Dartmouth needs to withdraw more than 3.13 MGD from their own sources, it will require Dartmouth obtain a new permit.

Special Condition 2, Maximum Daily Withdrawals from Groundwater Withdrawal Points, reflects the MassDEP-approved Zone II maximum daily pumping rate for each of Dartmouth's permitted wells based on prolonged pumping tests. Withdrawals in excess of these maximum daily rates require approval from the Department.

Special Condition 3, Zone II Delineation requirements have been met and no further delineations are required as a condition of this permit.

Special Condition 4, Wellhead Protection requirements for all Dartmouth's wells have been met and are up to date as of the issuance of this permit.

Special Condition 5, Groundwater Monitoring, requires Dartmouth to conduct groundwater monitoring at the locations identified from March 1 through September 30 each year. This data will be used to evaluate the impact of the wells on the surrounding area. The results of the monitoring shall be submitted annually with Dartmouth's Annual Statistical Report. Dartmouth is in compliance with this Special Condition.

Special Condition 6, Residential Gallons per Capita Day (RGPCD) has not changed from the prior permit. Dartmouth's permit requires compliance with the RGPCD standard of 65 gpd by December 31, 2015. From 2017 to 2022, Dartmouth met the RGPCD requirement every year with the exception of 2017, when it was 66.

Special Condition 7, Performance Standard for Unaccounted for Water (UAW) has changed from the prior permit. This permit requires compliance with the 10% performance standard for two out of three of the most recent calendar years. From 2017 to 2022, Dartmouth met the prior UAW requirement every year with the exception of 2020, when it was 11%, and 2022, when it was 18%. Dartmouth was required to submit a UAW Compliance Plan with its 2022 ASR, but did not. Dartmouth shall conduct a American Waterworks M36 Audit, the first step of a UAW Compliance Plan, within six months of the issuance of the Final permit.

Special Condition 8, Seasonal Limits on Nonessential Outdoor Water Use, has not changed from the prior permit, and is based in part upon the permittee's Residential Gallons per Capita Day (RGPCD) for the preceding year, and will be implemented according to either: 1) calendar triggered restrictions; or 2) streamflow triggered restrictions.

1. **Calendar triggered restrictions:** Restrictions shall be implemented from May 1st through September 30th. Many public water suppliers will find this option easier to implement and enforce than the streamflow triggered approach.

2. **Streamflow triggered restrictions:** Restrictions shall be implemented at those times when streamflow falls below designated flow triggers measured at an assigned, web-based, real-time U.S. Geologic Survey (USGS) stream gage from May 1st through September 30th. At a minimum, restrictions shall commence when streamflow falls below the trigger for three consecutive days. Once

implemented, the restrictions shall remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for seven consecutive days.

If Dartmouth selects the streamflow approach, it has been assigned the USGS stream gage #1105933 – Paskamanset River near South Dartmouth, MA. The June ABF estimated using SYE is 1.20 cubic feet per second per square mile (cfsm) and the August ABF value is 0.41 cfsm. These cfsm units translate to the Paskamanset River gage streamflow triggers of 32 cubic feet per second (cfs) for May and June, and 11 cfs for July, August and September.

Should the reliability of flow measurement at the Paskamanset River gage be so impaired as to question its accuracy, the Permittee may request MassDEP's review and approval to transfer to another gage to trigger restrictions. MassDEP reserves the right to require use of a different gage.

Drought triggered restrictions are incorporated into the seasonal limits on outdoor water use as outlined in this Special Condition. Times of low streamflow and drought do not always coincide, but both low streamflow and drought conditions can have adverse effects on water supplies, natural resources and aquatic life. Please note that many communities impose drought-based outdoor water use restrictions before the Massachusetts Drought Management Task Force declares a Drought Advisory because drought conditions can begin to impact local water supplies before a regional advisory is declared.

Special Condition 9, Streamflow Threshold – from June 1 through September 14 of each year, should streamflow in the Paskamansett River fall to 5.0 cfs or below Dartmouth shall cease the operation of Wells E-1, E-2, F-1 and F-2. To allow flexibility in operating the system and to meet peak demand, if an emergency necessitates the shutdown of Well D at any time when Wells E-1 and E-2 are shut down, then Well D's maximum daily rate of 0.5 MGD may be transferred to E-1 and E-2, either separately or combined. In addition, from June 1 through September 14 of each year, when streamflow in the Paskamansett River fall to 5.0 cfs and if an emergency necessitates the shutdown of Well A or Well B at any time when Wells F-1 and F-2 are not shut down, then Well A's maximum daily rate of 0.496 MGD may be transferred to F-1 and F-2, or Well B maximum daily rate of 0.507 MGD may be transferred to F-1 and F-2 either separately or combined.

Special Condition 10, Streamflow and Wetlands Monitoring – requires Dartmouth to conduct streamflow monitoring of the Paskamanset River and wetlands monitoring at plots adjacent to the Panelli Well #3 and Panelli Wellfield. Dartmouth is in compliance with this Special Condition.

Special Condition 11, General Water Conservation Requirements, has not changed from the prior permit, and incorporates the Water Conservation Standards for the Commonwealth of Massachusetts adopted by the Water Resources Commission in July 2018.

Special Condition 12, Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins, requires permittees with permitted groundwater sources in subbasins with net groundwater depletion (NGD) of 25% or more during August to minimize their withdrawal impacts, to the greatest extent feasible, through optimization of groundwater source use, surface water releases to improve streamflows, outdoor water use restrictions, and water conservation programs that go beyond standard Water Management permit requirements. Dartmouth's permitted wells are located in subbasins #22065 and #22003, of which #22003 has an August NGD of 47%. Based on Department records and information

submitted by Dartmouth, the Department finds that the minimization requirements are met as outlined below and as conditioned as follows in the permit:

- Dartmouth has no surface water supplies and, therefore, cannot make releases to improve streamflow.
- Dartmouth's rate structure is evaluated annually.
- Installation of an automated cellular meter reading system will be completed in 2024.
- Dartmouth will provide real-time water usage data via access to computer software program.
- Quarterly billing will begin in 2024, or Dartmouth shall provide a detailed summary outlining any delays in this schedule.
- Second meters have been installed for some water customers to measure outdoor water use which is billed at a higher seasonal rate (commercial sewer rate).
- Low flow aerators and toilet flappers are offered to all customers at no cost.
- Hydrant use is metered and billed.
- Fines for stealing water or tampering with fire hydrants are established and enforced.
- The limits on nonessential outdoor water use set forth in Special Conditions 8 and 9 of Dartmouth's WMA Permit were developed to minimize withdrawals in the Paskamansett River in August.
- Condition 9 further restricts withdrawals from June 1 through September 14 of each year, should streamflow of the Paskamansett River fall to 5.0 cfs or below Dartmouth shall cease the operation of Wells E-1, E-2, F-1 and F-2.
- During low flows, Dartmouth purchases surface water from New Bedford (The City of New Bedford's Water Supply is derived from five ponds located in Lakeville and Rochester, MA.)
- Since August NGD were calculate in 2010, Dartmouth has developed 4 new supplies in subbasin 22065 with the goal of reducing streamflow impacts to the Paskamansett River in subbasin 22003. Dartmouth Wells P1 (-13G), P2 (-14G), P3 (-15G) and P4 (-16G) are permitted in subbasin 22065. P1 and P2 were brought on-line in March of 2008, P3 and P4 started pumping in February of 2016.

Special Condition 13, Mitigation Requirements, [1], requires mitigation of the impacts of withdrawals above the permittee's baseline by direct and/or indirect mitigation activities. Dartmouth's Baseline in the Buzzards Bay Basin (2.79 MGD) is based on the average annual withdrawals made during 2003-2005 plus 5%. Mitigation of the impacts of increasing withdrawals can be through:

- Direct mitigation that will result in enhanced streamflows through
  - Purchase and retirement of other registered or permitted withdrawals,
  - Surface water releases,
  - Stormwater recharge, or
  - Infiltration and inflow removal (I/I) from sewer systems.
- Indirect mitigation activities that will result in streamflow and habitat improvements.

[1] Baseline is the volume of water withdrawn in 2005 plus 5%, or the average volume withdrawn from 2003 to 2005 plus 5%, which is greater. Baseline cannot be less than the registered volume and cannot be more than the authorized volume during the 2003-2005 period. For suppliers with authorizations in multiple major basins, baseline is computed for each basin and for the entire system.

Dartmouth is a Tier 3 permittee, because a withdrawal increase of only 3,000 gallons per day over baseline will change the Groundwater Withdrawal Category (GWC) in subbasin #22065. The full proposed increase would change the GWC from a GWC 1 to a GWC 5, and the Biological Category from a BC 4 to a BC 5. However, this change has already occurred because four wells were added to this subbasin after the SWMI GWC and BC modeling dates, but before the 2014 SWMI regulations were finalized. Dartmouth has demonstrated that there is no feasible alternative to additional withdrawals in subbasin #22065 by meeting:

1. 310 CMR 36.22(7)(a)(1). All alternative groundwater sources are in subbasins in groundwater withdrawal categories 4 or 5 (subbasin #22003); and
2. 310 CMR 36.22(7)(a)(2). Taking additional water from alternative groundwater sources would have an adverse impact on the subbasin's biological category, groundwater withdrawal category, or seasonal withdrawal category (subbasin #22003); and
3. 310 CMT 36.22(7)(a)(3) Dartmouth also met the requirements for no feasible alternative source because of the significant financial impact of purchasing water from New Bedford.

Therefore, Dartmouth may proceed with proposing mitigation in accordance with 310 CMR 36.22(7)(b). The mitigation volume calculation below assumes that Dartmouth's future withdrawals will be discharged to on-site septic systems at the same rate (40%) as current water withdrawals. A "wastewater adjustment" is calculated for water withdrawn that is returned to the ground as wastewater within the same major basin. After calculating for all of the wastewater return adjustments, Dartmouth's total mitigation requirement based on renewing at a permitted volume of 1.97 MGD will require up to 224,000 gallons per day of direct mitigation. Since Dartmouth is a Tier 3 permittee, any indirect mitigation being applied will be done so at a higher ratio where feasible. In this case MassDEP will require the amount of indirect mitigation credits to be doubled. Please see Table 2.

Table 2: Dartmouth Water Department
Mitigation Volume Calculation

Permitted amount above Baseline = 0.34 MGD • Permitted amount above Baseline: 3.13 – 2.79 = 0.34 MGD
Adjustment for Wastewater Discharge to Local Groundwater = 0.116 MGD • 40% of increased withdrawals are delivered to areas with on-site septic systems: 0.34 MGD x 0.40 (40%) = 0.136 MGD • 85% of water delivered to areas with on-site septic systems returns to groundwater: 0.136 MGD x 0.85 (85%) = 0.116 MGD
Amount to be Mitigated after Adjustment for Wastewater Discharge to Local Groundwater = 0.224 MGD • Permitted amount above baseline (0.34 MGD) – adjustment for wastewater discharge to local groundwater (0.116 MGD) = 0.224 MGD or 224,000 gallons per day

Dartmouth identified direct mitigation volumes associated with I/I projects completed over several years for inclusion in their mitigation plan. The total direct mitigation volumes achieved through these I/I projects completed between 2015-2020 is 0.069 MGD. Details are included in Appendix E.

In addition, on December 5, 2023, Dartmouth retired WMA registration (#42407203) for the cranberry property off Flag Swamp Road in Dartmouth. This retired 37-acre old style bog was registered for 0.33 MGD for cranberry cultivation and harvesting. The Department identified that 22.5% percent of cranberry withdrawals are consumptive and available as direct mitigation credits. The retiring of this

property provides 0.074 MGD in direct mitigation credit, for a total direct mitigation credit of 0.143 MGD. Please see Appendix E.

Because Dartmouth's actual withdrawals have been significantly below their baseline withdrawals and due to the category changes discussed above, MassDEP is requiring that Dartmouth reevaluate their direct mitigation options when their authorized annual withdrawal is closer to exceeding 3.01 MGD. Dartmouth may increase its annual average daily withdrawals to the maximum authorized volume (3.13 MGD) provided it can demonstrate to MassDEP's satisfaction that it is complying with Special Conditions 6 – 13 and has shown no additional direct mitigation options available at that time. Such demonstration shall provide sufficient details to show Dartmouth is complying with the following conditions:

- A Residential Gallons per Capita Daily water use at or below 65;
- An Unaccounted-for-water (UAW) loss at or below 10%, or Dartmouth shows it is implementing all UAW functional equivalence requirements;
- The required nonessential outdoor water use restrictions are implemented;
- The required monitoring of streamflows in the Paskamanset River and that the stream triggered pumping reductions are implemented, as necessary;
- The required Water Conservation, Minimization and Mitigation requirements are implemented.

Dartmouth may request a that the indirect migration credits already approved in this permit renewal (Please see Appendix F) be used to offset the proposed increase in their withdrawals.

As noted above, Dartmouth is a Tier 3 applicant, so the final number of indirect credits to obtain an authorized withdrawal of 3.13 MGD is doubled from 8 to 16. Dartmouth has identified 16 possible indirect credits from a wetlands bylaw, stormwater bylaw, and I/I work. These indirect credits may be submitted for consideration as part of any future request for additional water, after additional direct mitigation is reevaluated.

Special Condition 14, Reporting Requirements, ensures that the information necessary to evaluate compliance with the conditions included herein is accurately reported.

General Permit Requirements, contains conditions that pertain to all permittees.

Response to Public Comments

No comments were submitted during the public comment period, which ran from April 10, 2024 to May 10, 2024.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
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Governor

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Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

WATER WITHDRAWAL PERMIT RENEWAL
Permit #9P2-4-24-072.01
Town of Dartmouth

This renewal of Permit #9P2-4-24-072.01 is approved pursuant to the Massachusetts Water Management Act (WMA) for the sole purpose of authorizing the withdrawal of a volume of water as stated below and subject to the following special and general conditions. This amended permit conveys no right in or to any property.

PERMIT NUMBER: #9P2-4-24-072.01 **RIVER BASIN**: Buzzards Bay

PERMITTEE: Town of Dartmouth
Dartmouth Town Hall
400 Slocum Road
Dartmouth, MA 02747

EFFECTIVE DATE: June 11, 2024

EXPIRATION DATE: September 4, 2032

TYPE AND NUMBER OF WITHDRAWAL POINTS: Groundwater: 11 Surface Water: 0

USE: Public Water Supply **DAYS OF OPERATION**: 365

AUTHORIZED WITHDRAWAL POINTS:

Table 1: Permitted Withdrawal Points

Well Name	PWS Source ID Code	Well Name	PWS Source ID Code
Well D	4072000-06G	Well F-2	4072000-12G
Well E-1	4072000-09G	Panelli #1	4072000-13G
Well E-2	4072000-10G	Panelli #2	4072000-14G
Well F-1	4072000-11G	Panelli #3	4072000-15G
Violetta #4	4072000-17G	Panelli Wellfield	4072000-16G
		Violetta #5	*4072000-18G

Special Conditions

1. Maximum Authorized Annual Average Withdrawal

This permit authorizes the Town of Dartmouth to withdraw water from the Buzzards Bay Basin at the rate described below in Table 2. The permitted volume is in addition to the 1.16 MGD that the Town is authorized to withdraw from its sources in the Buzzards Bay Basin under its WMA registration #4-24-072.01. The permitted volumes are expressed both as an average daily withdrawal rate (million gallons per day or MGD), and as a total annual withdrawal volume (million gallons per year or MGY) for each permit period outlined. The Department of Environmental Protection (MassDEP or the Department) will use the raw water withdrawal volume from all authorized withdrawal points to assess compliance with the registered and permitted withdrawal rates.

Table 2: Buzzards Bay Authorized Withdrawal Rates

Permit Periods	Total Raw Water Withdrawal Volumes*			
	Permit*		Permit + Registration*	
	Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
6/11/2024 to 9/4/2027	1.97*	719.05	1.97+1.16=3.13*	1,142.45
9/5/2027 to 9/4/2032	1.97*	719.05	1.97+1.16=3.13*	1,142.45

*System-wide authorized withdrawals are limited to 3.01 MGD until such time as Dartmouth meets the requirements described in Condition 13, Mitigation Requirements, and obtains approval from MassDEP.

2. Maximum Daily Withdrawals from Groundwater Withdrawal Points

Withdrawals from permitted groundwater sources are not to exceed the approved maximum daily rates listed in Table 3 below without advance written approval from the Department.

Table 3: Maximum Daily Withdrawal Rates from Authorized Groundwater Withdrawal Points

Well Name	PWS Source ID Code	Maximum Daily Rate (MGD) for Individual Wells	Maximum Daily Rate (MGD) for Well Combinations
Well D	4072000-06G	0.50	Combined shall not exceed 1.73
Well E-1	4072000-09G	0.72	
Well E-2	4072000-10G	1.01	
Well F-1	4072000-11G	0.58	--
Well F-2	4072000-12G	0.48	--
Panelli #1	4072000-13G	--	Combined shall not exceed 0.864
Panelli #2	4072000-14G	--	
Panelli #3	4072000-15G	0.096	--
Panelli Wellfield	4072000-16G	0.336	--
Violetta #4	4072000-17G	--	Combined shall not exceed 0.60
Violetta #5	4072000-18G		

3. Zone II Delineation
Department records show that all of Dartmouth's sources have approved Zone II delineations, therefore, no further Zone II work is required.

4. Wellhead and Surface Water Protection
Department records show that Dartmouth has complied with Wellhead Protection regulations at 310 CMR 22.21(2).

5. Groundwater Monitoring
Dartmouth is required to conduct groundwater monitoring near the two permitted Violetta Wells as outlined in Appendix D.

6. Performance Standard for Residential Gallons Per Capita Day Water Use
Dartmouth's Performance Standard for Residential Gallons Per Capita Day (RGPCD) is 65 gallons. Dartmouth was required to be in compliance with the Performance Standard by December 31, 2015. Dartmouth shall report its RGPCD water use annually in its Annual Statistical Report (ASR). See Appendix A for additional information on the requirements if the Performance Standard for RGPCD is not met.

7. Performance Standard for Unaccounted for Water
Dartmouth's Performance Standard for Unaccounted for Water (UAW) is 10% of overall water withdrawal. Dartmouth was required be in compliance with the Performance Standard by December 31, 2015. This condition has been modified slightly to require Dartmouth to meet the 10% performance standard for two out of three of the most recent calendar years. Dartmouth shall report its UAW annually in its Annual Statistical Report (ASR). Dartmouth is currently out of compliance with this standard and shall complete an American Waterworks M36 Audit within six months of this permit being issued as final. See Appendix B for additional information on requirements if the Performance Standard for UAW is not met.

8. Seasonal Limits on Nonessential Outdoor Water Use
Dartmouth shall limit nonessential outdoor water use through mandatory restrictions from May 1st through September 30th as outlined in Table 4 below.

Dartmouth shall be responsible for tracking streamflow gages and drought advisories and recording and reporting when restrictions are implemented if triggered restrictions are implemented. See Table 5: *Instructions for Accessing U.S. Geologic Survey Groundwater Level and Massachusetts Drought Advisory Website Information.* Dartmouth shall also document compliance with the seasonal limits on nonessential outdoor water use annually in its Annual Statistical Report (ASR), and indicate whether it anticipates implementing calendar triggered restrictions or USGS monitoring well triggered restrictions during the next year.

Restricted Nonessential Outdoor Water Uses
Nonessential outdoor water uses that are subject to mandatory restrictions include**:**

- irrigation of lawns via sprinklers or automatic irrigation systems;
- filling swimming pools;
- washing of vehicles, except in a commercial car wash or as necessary for operator safety; and

- washing exterior building surfaces, parking lots, driveways or sidewalks, except as necessary to apply surface treatments such as paint, preservatives, stucco, pavement or cement.

The following uses may be allowed, before 9 am and after 5 pm, when mandatory restrictions are in place:

1. irrigation to establish a new lawn and new plantings during the months of May and September;
2. irrigation of public parks and recreational fields by means of automatic sprinklers outside the hours of 9 am to 5 pm;
3. irrigation of gardens, flowers and ornamental plants by means of a hand-held hose or drip irrigation systems; and
4. irrigation of lawns by means of a hand-held hose.

Water uses NOT subject to mandatory restrictions are those required:

- for health or safety reasons;
- by regulation;
- for the production of food and fiber;
- for the maintenance of livestock; or
- to meet the core functions of a business (for example, irrigation by golf courses as necessary to maintain tees, greens, and limited fairway watering, or irrigation by plant nurseries as necessary to maintain stock).

Public Notice of Seasonal Nonessential Outdoor Water Use Restrictions

Dartmouth shall notify its customers of the restrictions, including a detailed description of the restrictions and penalties for violating the restrictions. Notice that restrictions have been put in place shall be filed each year with the Department within 14 days of the restriction's effective date. Filing shall be in writing on the form "Notification of Water Use Restrictions" available on MassDEP website.

Table 4: Seasonal Limits on Nonessential Outdoor Water Use
May 1 to September 30

Dartmouth meeting the 65 RGPCD standard for the preceding year (as reported in the ASR and accepted by MassDEP) must implement either:
1. Calendar Triggered Restrictions from May 1st through September 30th **No nonessential outdoor water use from 9 am – 5 pm**
2. Streamflow Triggered Restrictions from May 1st through September 30th **No nonessential outdoor water use from 9 am – 5 pm whenever:** **a) Streamflow at the assigned USGS local stream gage #1105933 – Paskamanset River near South Dartmouth, MA falls below the following designated flow triggers for three (3) consecutive days:** • **May 1st through June 30th: 32 cfs (based on minimum flows that are protective of habitat for fish spawning during the spring bioperiod), and** • **July 1st through September 30th: 11 cfs (based on minimum flows that are protective of habitat for fish rearing and growth during the summer bioperiod).** **Once implemented, the restrictions shall remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for seven (7) consecutive days; or**

b) A Drought Advisory or higher is declared by the Massachusetts Drought Management Task Force.

Dartmouth NOT meeting the 65 RGPCD standard for the preceding year (as reported in the ASR and accepted by MassDEP) must implement either:

1. Calendar Triggered Restrictions from May 1st through September 30th

a) Nonessential outdoor water use is allowed TWO DAYS per week before 9 am and after 5 pm; and

b) Nonessential outdoor water use is allowed ONE DAY per week whenever A Drought Advisory or higher is declared by the Massachusetts Drought Management Task Force.

2. Streamflow Triggered Restrictions from May 1st through September 30th

Nonessential outdoor water use is allowed ONE DAY per week before 9 a.m. and after 5 p.m. whenever:

a) Streamflow at the assigned USGS local stream gage #1105933 – Paskamanset River near South Dartmouth, MA falls below the following designated flow triggers for three (3) consecutive days:

- **May 1st through June 30th: 32 cfs (based on minimum flows that are protective of habitat for fish spawning during the spring bioperiod), and**
- **July 1st through September 30th: 11 cfs (based on minimum flows that are protective of habitat for fish rearing and growth during the summer bioperiod).**

Once implemented, the restrictions shall remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for seven (7) consecutive days; or

b) A Drought Advisory or higher is declared by the Massachusetts Drought Management Task Force.

Table 5: Instructions for Accessing Streamflow and Drought Advisory Website Information

Streamflow information is available at the USGS National Water Information System (NWIS): Web Interface. The USGS NWIS default shows Massachusetts streamflows in real time, i.e., the most recent, usually quarterly hourly, reading made at each USGS stream gage.

Seasonal Limits on Nonessential Outdoor Water Use are implemented when the mean daily streamflow falls below the designated trigger. The mean daily flow is not calculated until after midnight each day when the USGS computes the hourly data into a mean daily streamflow. As a result, Dartmouth must use the mean daily streamflow from the preceding day when tracking streamflows.

Mean daily streamflow gage readings are available at the USGS NWIS Web Interface at http://waterdata.usgs.gov/ma/nwis/current/?type=flow.

- **Scroll down to #1105933 – Paskamanset River near South Dartmouth, MA.**
- **Click on the gage number.**
- **Click on "Real Time Legacy Page."**
- **Scroll down to "Provisional Date Subject to Revision – Available data for this site" and click on the drop down menu.**

- **Click on "Time-series: Daily data" and hit GO.**
- **Scroll down to the "Available Parameters" box. Within the box, be sure "Discharge (mean)" is checked, then, under "Output Format" click "Table" and hit GO.**
- **Scroll down to "Daily Mean Discharge, cubic feet per second" table and find the current date on the table.**
- **Compare the cubic feet per second (cfs) measurement shown on the table to the cfs shown under Streamflow Triggered Restrictions above.**

Drought Advisory information is available at the Massachusetts Department of Conservation and Recreation (DCR) Drought Status Website at http://www.mass.gov/dcr/waterSupply/rainfall/drought.htm.

- **Under "Drought Status Reports", click on "drought map" on the right-hand side of the page. The color coded map displays the six drought regions in Massachusetts. Restrictions are implemented when a Drought Advisory, Watch, Warning or Emergency is announced through the DCR website.**

Nothing in the permit shall prevent the Permittee from implementing water use restrictions that are more stringent than those set forth in this permit.

9. Streamflow Threshold

From June 1 through September 14 of each year, should streamflow in the Paskamansett River at the Russell Mills Road staff gauge fall to 5.0 cfs or below, Dartmouth shall cease the operation of Wells E-1, E-2, F-1 and F-2. To allow flexibility in operating the system and to meet peak demand, if an emergency necessitates the shutdown of Well D at any time when Wells E-1 and E-2 are shut down, then Well D's maximum daily rate of 0.5 MGD may be transferred to E-1 and E-2, either separately or combined. In addition, from June 1 through September 14 of each year, when streamflow in the Paskamansett River fall to 5.0 cfs and if an emergency necessitates the shutdown of Well A or Well B at any time when Wells F-1 and F-2 are not shut down, then Well A's maximum daily rate of 0.496 MGD may be transferred to F-1 and F-2, or Well B maximum daily rate of 0.507 MGD may be transferred to F-1 and F-2 either separately or combined.

10. Streamflow and Wetlands Monitoring

Dartmouth is required to conduct streamflow monitoring of the Paskamanset River and wetlands monitoring at plots adjacent to the Panelli Well #3 and Panelli Wellfield. Please see Appendix C.

11. Water Conservation Requirements

At a minimum, Dartmouth shall implement the following conservation measures in Table 6. The Department recognizes that Dartmouth is currently implementing a number of these requirements. Compliance with the water conservation requirements shall be reported to the Department upon request, unless otherwise noted below.

Table 6: Minimum Water Conservation Requirements

System Water Audits and Leak Detection

1. At a minimum, conduct a full leak detection survey every three years. The first full leak detection survey shall be completed no later than 3 years from the date of last documented leak detection survey.

2. Perform a leak detection survey of those sections of the distribution system that have not been surveyed within the last year whenever the percentage of unaccounted for water increases by 5% or more (for example an increase from 3% to 8%) over the percentage reported on the ASR for the prior calendar year. Within 60 days of completing the leak detection survey, Permittee shall submit to MassDEP a report detailing the leak detection survey, any leaks uncovered as a result of the survey or otherwise, dates of repair and the estimated water savings as a result of the repairs.

3. Conduct field surveys for leaks and repair programs in accordance with the AWWA Manual 36.

4. Permittee shall have repair reports available for inspection by MassDEP. Permittee shall establish a schedule for repairing leaks that is at least as stringent as the following:
   - Leaks of 15 gallons per minute or more shall be repaired as soon as possible but not later than one month after leak detection.*
   - Leaks of less than 15 gallons per minute, but greater than 5 gallons per minute, shall be repaired as soon as possible but not later than two months after leak detection.*
   - Leaks of 5 gallons per minute or less shall be repaired as soon as possible but not later than six months after leak detection, except that hydrant leaks of one gallon or less per minute shall be repaired as soon as possible.*
   - Leaks shall be repaired in accordance with the priority schedule including leaks up to the property line, curb stop or service meter, as applicable.
   - Have water use regulations in place that require property owners to expeditiously repair leaks on their property.

   The following exceptions can be considered:
   - Repair of leakage detected during winter months can be delayed until weather conditions become favorable for conducting repairs;* and
   - Leaks in freeway, arterial or collector roadways may be coordinated with other scheduled projects being performed on the roadway.**

   *Reference: MWRA regulations 360 CMR 12.09

   **Mass Highway or local regulations may regulate the timing of tearing up pavement on roads to repair leaks.

Metering

1. Calibrate all source and finished water meters at least annually and report date of calibration on the ASR.

2. Ensure that the system is 100% metered, including all water use at municipal facilities (schools, school athletic fields, etc.).

3. All water distribution system users shall have properly sized service lines and meters that meet AWWA calibration and accuracy performance standards.

Table 6: Minimum Water Conservation Requirements
AWWA References: AWWA Manual M22 – Sizing Water Service Lines and Meters AWWA Manual M6 – Water Meters, or as amended
4. Permittee shall have an ongoing program to inspect individual service meters to ensure that all service meters accurately measure the volume of water used by your customers. The metering program shall include regular meter maintenance, including testing, calibration, repair, replacement and checks for tampering to identify and correct illegal connections.
5. Ensure placement of sufficient funds in the annual water budget to calibrate, repair, or replace meters as necessary.
Pricing
1. Implement a water revenue structure that includes the full cost of operating the water supply system in compliance with state and federal requirements by the next 5-year review. Evaluate revenues every three to five years and adjust rates as needed. Full cost pricing factors all costs – operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) – into the revenue structure. AWWA References for Additional Information on Pricing: AWWA Manual 1- Principals of Water Rates, Fees and Charges
2. AWWA Manual 29- Fundamentals of Water Utility Financing
3. Permittee reports using an increasing block rate structure and shall continue to do so.
Residential and Public Sector Conservation
1. Permittee shall meet the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code.
2. Meter or estimate water used by contractors using fire hydrants for pipe flushing and construction.
3. Dartmouth has retrofitted that all municipally owned public buildings in the service area.
Industrial and Commercial Water Conservation
1. Permittee shall review the use records for its industrial, commercial and institutional water users and develop an inventory of the largest water users. Permittee shall develop and implement an outreach program designed to inform and (where appropriate) work with its largest industrial, commercial and institutional water users on ways to reduce their water use. Such outreach plans can include, but are not limited to: information on water audits, meter sizing, water reuse, low-flow plumbing fixtures, mandatory outdoor water use restrictions, suggestions for contacting trade associations for process specific information on water use reductions, and information on contacting the Executive Office of Environmental Affairs Office of Technical Assistance for Toxics Use Reduction (OTA) which offers a range of assistance and information to help facilities improve water use efficiency and reduce wastewater discharge. OTA can be contacted at (617) 626-1060 or at www.mass.gov/envir/ota.
2. Upon request by MassDEP, Permittee shall report on industrial, commercial and institutional water conservation including the results of its review of water use records for industrial, commercial and institutional water users, the inventory of the largest water users, copies of any outreach materials distributed to industrial, commercial and institutional water users, and

Table 6: Minimum Water Conservation Requirements
to the extent practical, a summary of water use reductions or savings that have resulted. Upon receipt of this report, MassDEP will take whatever action it deems appropriate to promote the interests of the Water Management Act, including without limitation requiring Permittee to take additional actions to reduce industrial, commercial and institutional water use.
Lawn and Landscape
1. Review Permittee's water use restriction bylaw to determine if it provides authority to implement and enforce water use restrictions required by Special Condition #8, "Seasonal Limits on Nonessential Outdoor Water Use". If it does not, adopt a water use restriction bylaw, ordinance or regulation by May 1, 2024, to implement the new restrictions.
Public Education and Outreach
1. Develop and implement a Water Conservation Education Plan. Permittee's Water Conservation Education Plan shall be designed to educate the Permittee's water customers on ways to conserve water. Without limitation, Permittee's plan may include the following actions: • Annual work sheets, included in water bills or under separate cover, to enable customers to track water use and conservation efforts and estimate the dollar savings; • Public space advertising/media stories on successes (and failures); • Conservation information centers perhaps run jointly with electric or gas company; • Speakers for community organizations; • Partner with garden clubs, or other private and non-profit organizations, to promote efficient water use; • Provide information on water-wise landscaping, gardening, efficient irrigation and lawn care practice; • Public service announcements; radio/T.V./audio-visual presentations; • Joint advertising with hardware stores to promote conservation devices; • Water conservation workshops for the general public • Use of civic and professional organization resources; • Special events such as Conservation Fairs; • Develop materials that are targeted to schools with media that appeals to children, including materials on water resource projects and field trips; and • Make multilingual materials available as needed. o References and additional information available through the USEPA Water Sense Program at http://www.epa.gov/watersense.
2. Upon request of MassDEP, Permittee shall report on its public education and outreach effort, including a summary of activities developed for specific target audiences, any events or activities sponsored to promote water conservation and copies of written materials.

12. Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins

Permittees with permitted groundwater sources in subbasins with net groundwater depletion of 25% or more during August are required to minimize their withdrawal impacts, to the greatest extent feasible, through optimization of groundwater source use, surface water releases to improve streamflows, outdoor water use restrictions and water conservation programs that go beyond standard Water Management permit requirements. Dartmouth has permitted wells located in subbasin #22003

which has an August NGD of 47% net groundwater depletion. Based on Department records and information submitted by Dartmouth, the Department finds that minimization requirements will be met with additional requirements outlined here:

- Dartmouth has no surface water supplies and, therefore, cannot make releases to improve streamflow.
- Dartmouth's rate structure is evaluated annually.
- Installation of an automated cellular meter reading system will be completed in 2024.
- Dartmouth will provide real-time water usage data via access to computer software program.
- Quarterly billing will begin in 2024, or Dartmouth shall provide a detailed summary outlining any delays in this schedule.
- Second meters have been installed for some water customers to measure outdoor water use which is billed at a higher seasonal rate (commercial sewer rate).
- Low flow aerators and toilet flappers are offered to all customers at no cost.
- Hydrant use is metered and billed.
- Fines for stealing water or tampering with fire hydrants are established and enforced.
- The limits on nonessential outdoor water use set forth in Special Conditions 8 and 9 of Dartmouth's WMA Permit were developed to minimize withdrawals in the Paskamansett River in August.
- Condition 9 further restricts withdrawals from June 1 through September 14 of each year, should streamflow of the Paskamansett River fall to 5.0 cfs or below Dartmouth shall cease the operation of Wells E-1, E-2, F-1 and F-2.
- During low flows, Dartmouth purchases surface water from New Bedford (The City of New Bedford's Water Supply is derived from five ponds located in Lakeville and Rochester, MA.)
- Since August NGD were calculate in 2010, Dartmouth has developed 4 new supplies in subbasin 22065 with the goal of reducing streamflow impacts to the Paskamansett River in subbasin 22003. Dartmouth Wells P1 (-13G), P2 (-14G), P3 (-15G) and P4 (-16G) are permitted in subbasin 22065. P1 and P2 were brought on-line in March of 2008, P3 and P4 started pumping in February of 2016.

13. Mitigation Requirements

Dartmouth's total mitigation requirement based on renewing at the permitted volume of 1.97 MGD is 224,000 gallons per day. Dartmouth identified several years' worth of I/I projects completed after 2005 for their mitigation plan, as well as purchasing and retiring a registered cranberry bog, which qualify for direct mitigation credits. The total direct mitigation credits achieved through these projects is 0.143 MGD. Details are presented in Appendix E.

Dartmouth is a Tier 3 permittee, because the proposed withdrawal increase over baseline will change the Groundwater Withdrawal Category (GWC) in subbasin 22065 (Panelli Wells #1, #2, #3, and the Panelli Wellfield). A proposed increase of only 3,000 gallons per day will change the GWC, and the full proposed increase with change the GWC 1 to a GWC 5, and the Biological Category from a BC 4 to a BC 5. Total authorized withdrawals between the baseline withdrawal of 2.79 MGD, and the direct mitigation volumes outlined above, authorize withdrawals of 3.01 MGD at this time. The direct mitigation provided (0.143 MGD) represents 64% of the mitigation needed, (0.224 MGD), to achieve the full 3.13 MGD permitted. 64% of the 0.34 MGD ask over baseline is 0.22 MGD.

Dartmouth must reevaluate their direct mitigation options prior to exceeding 3.01 MGD. If Dartmouth wishes to withdraw more than 3.01 MGD, up to their potential authorized volume of 3.13 MGD, they must:

1. Submit a request to the MassDEP that demonstrates compliance with Special Conditions 6 –13 and indicate that no additional direct mitigation options are available to Dartmouth at that time.
2. If additional direct mitigation is not available and Dartmouth demonstrates compliance with Special Conditions 6-13, Dartmouth may, with MassDEP's written approval, withdraw up to 3.13 MGD using the indirect migration credits approved in this permit renewal (Please see Appendix F).

14. Reporting Requirements

Dartmouth shall report annually as required by completing the electronic Annual Statistical Report (eASR) for public water suppliers, and shall provide other reporting as specified in the Special Conditions above.

General Permit Conditions (applicable to all Permittees)

1. Duty to Comply The Permittee shall comply at all times with the terms and conditions of this permit, the Act and all applicable State and Federal statutes and regulations.

2. Operation and Maintenance The Permittee shall at all times properly operate and maintain all facilities and equipment installed or used to withdraw up to the authorized volume so as not to impair the purposes and interests of the Act.

3. Entry and Inspections The Permittee or the Permittee's agent shall allow personnel or authorized agents or employees of MassDEP to enter and examine any property, inspect and monitor the withdrawal, and inspect and copy any relevant records, for the purpose of determining compliance with this permit, the Act or the regulations published pursuant thereto, upon presentation of proper identification and an oral statement of purpose.

4. Water Emergency Withdrawal volumes authorized by this permit are subject to restriction in any water emergency declared by MassDEP pursuant to M.G.L. c. 21G, §§ 15-17, M.G.L. c. 111, § 160, or any other enabling authority.

5. Transfer of Permits This permit shall not be transferred in whole or in part unless and until MassDEP approves such transfer in writing, pursuant to a transfer application on forms provided by MassDEP requesting such approval and received by MassDEP at least thirty (30) days before the effective date of the proposed transfer. No transfer application shall be deemed filed unless it is accompanied by the applicable transfer fee established by 310 CMR 36.37.

6. Duty to Report The Permittee shall submit annually, on a form provided by MassDEP, a certified statement of the withdrawal. Such report is to be received by MassDEP by the date specified by MassDEP. Such report must be mailed or hand delivered to the address specified on the report form.

7. Duty to Maintain Records The Permittee shall be responsible for maintaining withdrawal records as specified by this permit.

8. Metering Withdrawal points shall be metered. Meters shall be calibrated annually. Meter shall be maintained and replaced as necessary to ensure the accuracy of the withdrawal records.

9. Amendment, Suspension or Termination The Department may amend, suspend or terminate this permit in accordance with M.G.L. c. 21G or 310 CMR 36.29.

APPEAL RIGHTS AND TIME LIMITS

This permit is a decision of MassDEP. Any person aggrieved by this decision may request an adjudicatory hearing. Any such request must be made in writing, by certified mail and received by MassDEP within twenty-one (21) days of the date of receipt of this permit.

No request for an appeal of this permit shall be validly filed unless a copy of the request is sent by certified mail, or delivered by hand to the local water resources management official in the community in which the withdrawal point is located; and for any person appealing this decision, who is not the applicant, unless such person notifies the permit applicant of the appeal in writing by certified mail or by hand within five (5) days of mailing the appeal to MassDEP.

CONTENTS OF HEARING REQUEST

310 CMR 1.01(6)(b) requires the request to include a clear and concise statement of the facts which are the grounds for the request and the relief sought. In addition, the request must include a statement of the reasons why the decision of MassDEP is not consistent with applicable rules and regulations, and for any person appealing this decision who is not the applicant, a clear and concise statement of how that person is aggrieved by the issuance of his permit.

FILING FEE AND ADDRESS

The Notice of Claim and supporting documentation must be sent must be sent by certified mail or hand delivered to:

Case Administrator
Office of Appeals and Dispute Resolution
Department of Environmental Protection
100 Cambridge Street, Suite 900
Boston, MA 02114

The request shall be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

EXEMPTIONS

The filing fee is not required if the appellant is a municipality (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority.

WAIVER

MassDEP may waive the adjudicatory hearing filing fee for any person who demonstrates to the satisfaction of MassDEP that the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request, an affidavit setting forth the facts which support the claim of undue hardship.

Duane LeVangie

June 11,2024

Duane LeVangie
Chief, Water Management Act Program
Bureau of Water Resources

Date

Appendix A – Functional Equivalence with the 65 Residential Gallons Per Capita Day Performance Standard

MassDEP will consider PWS permittees who cannot meet the 65 RGPCD performance standard to be functionally equivalent, and in compliance with their permit, if they have an on-going program in place that ensures "best practices" for controlling residential water use as described below.

If the permittee fails to document compliance with the RGPCD performance standard in its 2018 Annual Statistical Report (ASR), or in any ASR thereafter, then the permittee must file with that ASR a Residential Gallons Per Capita Day Compliance Plan (RGPCD Plan) which shall include, at a minimum:

1. A description of the actions taken during the prior calendar year to meet the performance standard;
2. An analysis of the cause of the failure to meet the performance standard;
3. A description of the actions that will be taken to meet the performance standard which must include, at a minimum, at least one of the following:
    a) a program that provides water saving devices such as faucet aerators and low flow shower heads at cost;
    b) a program that provides rebates or other incentives for the purchase of low water use appliances (washing machines, dishwashers, and toilets), or
    c) the adoption and enforcement of an ordinance, by-law or regulation to require the installation of moisture sensors or similar climate related control technology on all automatic irrigation systems;
    and may include, without limitation, the following:
    d) the use of an increasing block water rate or a seasonal water rate structure as a tool to encourage water conservation;
    e) a program that provides rebates or other incentives for the installation of moisture sensors or similar climate related control technology on automatic irrigation systems;
    f) the adoption and enforcement of an ordinance, by-law or regulation to require that all new construction include water saving devices and low water use appliances;
    g) the adoption and enforcement of an ordinance, by-law or regulation to require that all new construction minimize lawn area and/or irrigated lawn area, maximize the use of drought resistant landscaping, and maximize the use of top soil with a high water retention rate;
    h) the implementation of a program to encourage the use of cisterns or rain barrels for outside watering;
    i) the implementation of monthly or quarterly billing.
4. A schedule for implementation; and
5. An analysis of how the planned actions will address the specific circumstances that resulted in the failure to meet the performance standard.

If the permittee is already implementing one or more of these programs, it must include in its RGPCD plan the continued implementation of such program(s), as well as implementation of at least one additional program. All programs must include a public information component designed to inform customers of the program and to encourage participation in the program.

RGPCD plans may be amended to revise the actions that will be taken to meet the performance standard. Amended RGPCD plans must include the information set forth above.

If a RGPCD plan is required, the permittee must:

1. submit information and supporting documentation sufficient to demonstrate compliance with its RGPCD plan annually at the time it files its ASR, and
2. continue to implement the RGPCD plan until it complies with the performance standard and such compliance is documented in the permittee's ASR for the calendar year in which the standard is met.

Appendix B – Functional Equivalence with the 10% Unaccounted for Water Performance Standard

MassDEP will consider PWS permittees who cannot meet the 10% UAW performance standard to be functionally equivalent, and in compliance with their permit, if they have an on-going program in place that ensures "best practices" for controlling water loss. The water loss control program will be based on annual water audits and guidance as described in the AWWA/IWA *Manual of Water Supply Practices – M36, Water Audits and Loss Control Programs* (AWWA M36).

If, as of December 31, 2019, the permittee fails to document compliance with the Unaccounted for Water performance standard (UAW of 10% or less for 2 of the 3 most recent years throughout the permit period), then the permittee shall develop and implement a water loss control program following the *AWWA M36 Water Audits and Loss Control Programs* within 5 full calendar years.

1. Conduct an annual "top down" water audit, calculate the data validity level/score using AWWA Water Loss Control Committee's Free Water Audit Software, and submit the AWWA WLCC Free Water Audit Software: Reporting Worksheet and data validity score annually with its Annual Statistical Report (ASR).
    - If a PWS's data validity level/score is less than Level III (51-70), steps recommended through the audit(s) shall be taken to improve the reliability of the data prior to developing a long-term program to reduce real and apparent water losses.
    - Data with a validity score of 50 or less are considered too weak to be used to develop a component analysis or for infrastructure planning and maintenance.
    - Developing data with an acceptably strong validity score can be a multi-year process.
2. When the data validity score meets the Level III (51-70) requirement, the permittee shall conduct a component analysis to identify causes of real and apparent water loss and develop a program to control losses based on the results of the component analysis. The Permittee shall submit the component analysis and water loss control program with a proposed implementation schedule to the Department.
3. Continued implementation will be a condition of the permit in place of meeting the 10% UAW performance standard.
4. Upon request of the Department, the permittee shall report on its implementation of the water loss control program.

A PWS permittee may choose to discontinue the water loss program implementation if UAW, as reported on the ASR and approved by MassDEP, is below 10% for four consecutive years, and the water audit data validity scores are at least Level III (51-70) for the same four years.

NOTE FOR SMALL SYSTEMS: For small systems with less than 3,000 service connections or a service connection density of less than 16 connections per mile of pipeline, the Unavoidable Annual Real Loss (UARL) calculation and the Infrastructure Leak Index (ILI) developed as the steps of the top down water audit may not result in valid performance indicators, and may not be comparable to the UARL and ILI calculations for larger systems.

However, these small systems can benefit from developing reliable data and conducting an annual top down water audit. Small systems can rely on the real losses (gallons per mile of main per day) performance indicator developed in the water audit as a measure of real water loss when developing a water loss control program. The M36 Manual discusses the audit process for small systems, and

includes a chapter to guide small systems in understanding the results of their audits and in developing a water loss control program (*Manual of Water Supply Practices – M36, Fourth Edition, Chapter 9: Considerations for Small Systems*, pp. 293-305).

MassDEP UAW Water Loss Control Measures: Permittees who do not have MassDEP approved Water Loss Control Programs in place by 6th calendar year after 2019 will be required to implement the MassDEP UAW Water Loss Control Measures outlined below:

- An annual water audit and leak detection survey, as described in the AWWA M36 Manual, of the entire system.
  - Within one year, repair 75% (by water volume) of all leaks detected in the survey that are under the control of the public water system;
  - Thereafter, repair leaks as necessary to reduce permittee's UAW to 10% or the minimum level possible.
- Meter inspection and, as appropriate, repair, replace and calibrate water meters:
  - Large Meters (2" or greater) – within one year
  - Medium Meters (1" or greater and less than 2") – within 2 years
  - Small Meters (less than 1") – within three years
  - Thereafter, calibrate and or replace all meters according to type and specification.
- Bill at least quarterly within three years.
- Water pricing structure sufficient to pay the full cost of operating the system.

Hardship - A permittee may present an analysis of the cost effectiveness of implementing certain conservation measures included in the MassDEP UAW Water Loss Control Measures and offer alternative measures. Any analysis must explicitly consider environmental impacts and must produce equal or greater environmental benefits. Suppliers will be able to present:

- Reasons why specific measures are not cost effective because the cost would exceed the costs of alternative methods of achieving the appropriate standard;
- Alternative specific conservation measures that would result in equal or greater system-wide water savings or equal or greater environmental benefits than the conservation measures included in the MassDEP UAW Functional Equivalence Plan; and
- When applicable, an analysis demonstrating that implementation of specific measures will cause or exacerbate significant economic hardship.

Appendix C – Streamflow and Wetlands Monitoring

Dartmouth shall conduct the following streamflow and wetlands monitoring are required by Special Condition 9 of WMA Permit 9P2424072.01.

Streamflow Monitoring

From June 1 through September 14, Dartmouth shall access the USGS on-line streamflow data on a daily basis to determine if the mean daily flow in the Paskamanset River has met the 5.0 cfs threshold for ceasing operation of Wells E-1, E-2, F-1 and F-2. The mean daily streamflow gage readings for the Paskamanset River are available at the USGS NWIS Web Interface at:

http://waterdata.usgs.gov/ma/nwis/uv/?site_no=01105933&PARAmeter_cd=00065,00060

- Click on "Real Time Legacy Page."
- Scroll down to "Provisional Date Subject to Revision – Available data for this site" and click on the drop down menu.
- Click on "Time-series: Daily data" and hit GO.
- Scroll down to the "Available Parameters" box. Within the box, be sure "Discharge (mean)" is checked, then, under "Output Format" click "Table" and hit GO.
- Scroll down to "Daily Mean Discharge, cubic feet per second" table and find the current date on the table.

The mean daily flow is not calculated until after midnight each day when the USGS computes the hourly data into a mean daily streamflow. As a result, Dartmouth must use the mean daily streamflow from the preceding day when tracking streamflows.

At least twice weekly from June 1 through September 14 Dartmouth shall take a reading at the staff gage located at the Russells Mills Road bridge and compare this reading to the reading from the USGS gage. If the two readings are found to differ by more than 0.03 ft the USGS will be notified of the problem and necessary corrections shall be made to ensure consistent readings between the two gages.

Should the USGS gage become disabled, Dartmouth shall notify the Department and shall take daily readings at the staff gage at Russells Mills Road bridge to determine streamflow.

Monitoring reports shall be submitted annually by January 31 of the following year to MassDEP. Reports shall include the following data collected from June 1 through September 14:

- mean daily streamflow from the USGS Paskamanset River gage;
- twice weekly staff gage readings;
- any differences noted between the staff gage and USGS gage and actions taken to correct the difference;
- dates of shut down of Wells E-1, E-2, F-1 and F-2;
- any use of Well E-1 and/or E-2 necessitated by the shutdown of Well D.

Wetlands Monitoring

Types of Monitoring

- Water Level Monitoring
- Vegetative Monitoring

Monitoring Locations

- Existing monitoring deep wells DP-4 and DP-6;
- One shallow well (18" deep) at DP-4, to be designated as DP-4A, and one at DP-6, to be designated as DP-6A;
- One wetlands vegetative plot at DP-4, Plot A, and one at DP-6, Plot B.

Water Level Monitoring

- Monitor groundwater levels DP-4, DP-4A, DP-6 and DP-6A starting in fall of 2013 prior to installation of the Panelli Well #3 and Panelli Wellfield.
- Water level monitoring shall be conducted annually April to October, with readings of each monitoring well to be taken every two weeks.
- The height above ground level of each monitoring well shall be measured at the beginning and end of each monitoring season to determine if shifting of the wells has occurred. If shifting of the wells has occurred, Dartmouth shall reset the wells to ensure consistent readings from year to year.

Vegetative Monitoring

- Vegetative monitoring of Plot A and Plot B shall occur during the spring of 2013, 2015 and 2020.
- Results of the vegetative monitoring shall be reported using Section 1 of the *Bordering Vegetated Wetland Delineation Field Data Form* which can be found at: http://www.mass.gov/eea/agencies/massdep/water/watersheds/bordering-vegetated-wetland-delineation-manual.html

Reporting

Monitoring reports shall be submitted annually by January 31 of the following year to MassDEP and the Dartmouth Conservation Commission. Reports shall include the following data collected from April through September:

- rainfall data;
- record of average daily pumping of Panelli Well #3 and the Panelli Wellfield;
- water level readings from the four monitoring wells;
- height of the monitoring wells taken at the beginning and end of each monitoring season and any action taken to reset the wells;
- vegetative data (for years 2013, 2015 and 2020 only).

Appendix D –Groundwater Monitoring

Dartmouth shall conduct the following groundwater monitoring as required by Special Condition 5 of WMA Permit 9P2424072.01.

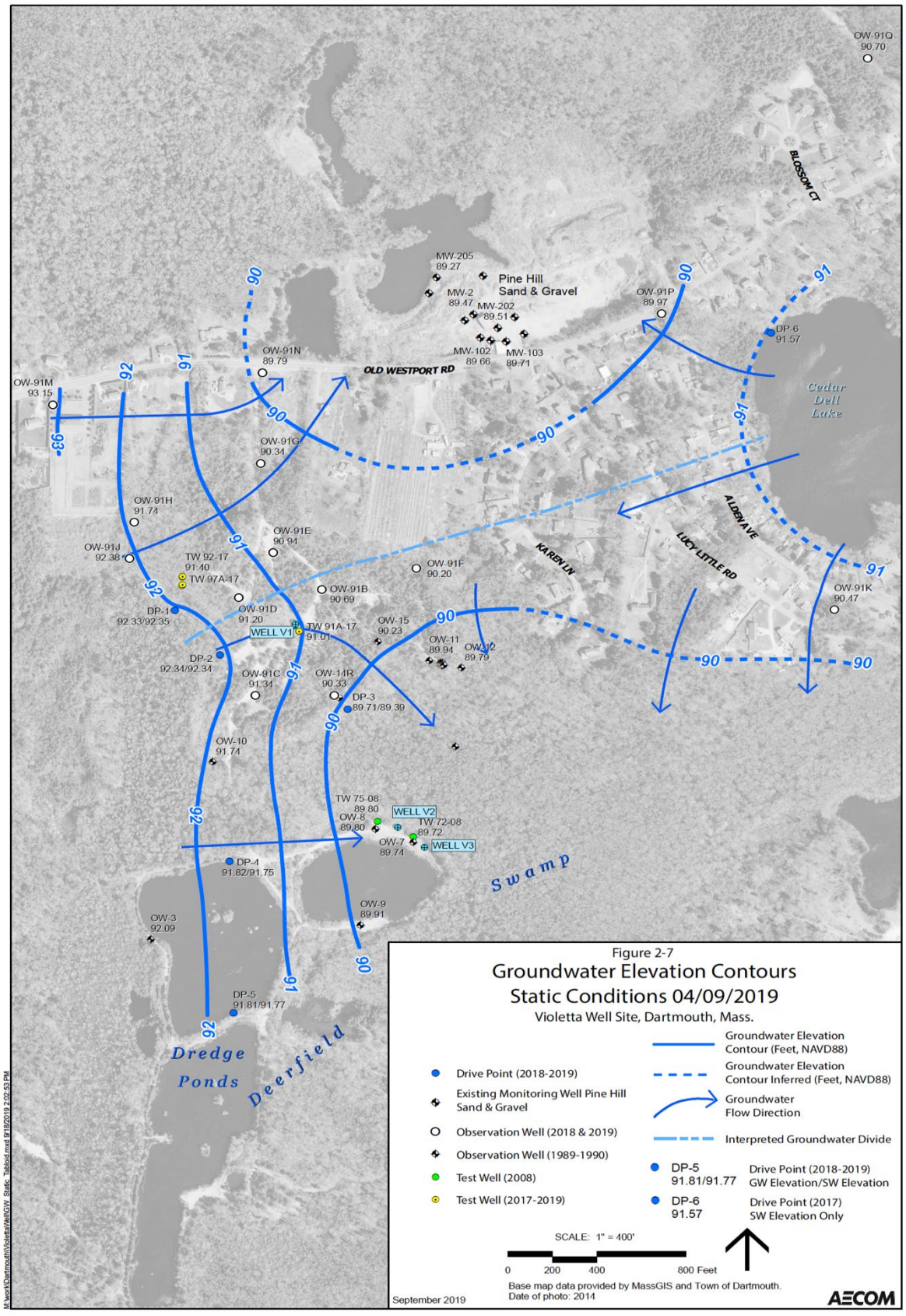
Dartmouth shall collect the following data twice a week from March 1st through September 30th annually:

- Groundwater levels from observation wells OW 91K, OW 91P and OW 91Q (shown on Figure 2-7 of the NSA Report, attached).
- Staff gauge readings in Cedar Dell Lake (at the site of DP-6, shown on Figure 2-7 of the NSA Report).
- The DP-6 staff gage should be replaced with a screened well to prevent silting. If well DP-6 is redeveloped, a mechanism to prevent silting must be added. DP-6 shall be cleaned as needed to obtain accurate readings and surveyed each spring.

Dartmouth will also track and record daily precipitation and ambient groundwater level data each year from March 1st through September 30th from the following sources:

- Precipitation data from the National Weather Station at the New Bedford Regional Airport (KEWB), located at latitude $41^0$68’ and latitude $70^0$96’
- Ambient groundwater levels at USGS Well MA-LKW 14 located 30 feet west of parking lot and about 300 feet north of State Route 105 at closed Lakeville State Hospital at latitude $41^0$52’28” and longitude $70^0$55’46”

The data will be submitted each year with Dartmouth’s Annual Statistical Report and will be evaluated during the next review of Dartmouth’s Water Management Permit.


OW-91Q
90.70
BLOSSOM CT
MW-205
89.27
Pine Hill
Sand & Gravel
MW-2
89.47
MW-202
89.51
OW-91P
89.97
DP-6
91.57
MW-102
89.66
MW-103
89.71
OW-91N
89.79
OLD WESTPORT RD
OW-91M
93.15
Cedar
Dell
Lake
OW-91G
90.34
OW-91H
91.74
OW-91E
90.94
OW-91J
92.38
TW 92-17
91.40
TW 97A-17
OW-91F
90.20
KAREN LN
ALDEN AVE
LUCY LITTLE RD
OW-91K
90.47
OW-91B
90.69
DP-1
92.33/92.35
OW-91D
91.20
WELL V1
TW 91A-17
91.01
OW-15
90.23
OW-11
89.94
OW-12
89.79
DP-2
92.34/92.34
OW-91C
91.34
OW-14R
90.33
DP-3
89.71/89.39
OW-10
91.74
TW 75-08
89.80
OW-8
89.80
WELL V2
TW 72-08
89.72
OW-7
89.74
WELL V3
DP-4
91.82/91.75
Swamp
OW-9
89.91
OW-3
92.09
DP-5
91.81/91.77
Dredge
Ponds
Deerfield
90
91
92
93
Figure 2-7
Groundwater Elevation Contours
Static Conditions 04/09/2019
Violetta Well Site, Dartmouth, Mass.
Groundwater Elevation Contour (Feet, NAVD88)
Groundwater Elevation Contour Inferred (Feet, NAVD88)
Groundwater Flow Direction
Interpreted Groundwater Divide
Drive Point (2018-2019)
Existing Monitoring Well Pine Hill Sand & Gravel
Observation Well (2018 & 2019)
Observation Well (1989-1990)
Test Well (2008)
Test Well (2017-2019)
DP-5 91.81/91.77
Drive Point (2018-2019) GW Elevation/SW Elevation
DP-6 91.57
Drive Point (2017) SW Elevation Only
SCALE: 1" = 400'
0
200
400
800 Feet
Base map data provided by MassGIS and Town of Dartmouth.
Date of photo: 2014
September 2019
AECOM

Appendix E – Dartmouth Mitigation Calculation

DIRECT MITIGATION
I/I removal summary table

Major Basin	*Year completed*	*Data Source(s)*[1]	*Activity Type (infiltration or inflow)*	*Activity*[2]	*Method*[3]	*Flow Estimate (mgd)*	*Measured or Removable I/I?*[4]	*Peak or Average Annual Flow?*[5]	*Notes*
Buzzards Bay	2015	2015 Sewer System Rehab Specifications and Plans Fay, Spofford & Thorndike, Burlington, MA	I and I	2015 Sewer System Rehabilitation – main line repair	CIP lining of 8-in. and 12-in. mainline sewers, CIP lining of 6-in.sewer service laterals, testing and sealing of 8-in. and 12-in. maintenance sewers,and 6-in. laterals, point repairs, rehab manhole	0.177	Removable	Average	0.117 x 0.5 = 0.056
Buzzards Bay	2018	2018 Manhole Rehabilitation Specs by Stantec, Burlington, MA, Performed by National Water Main Cleaning, Co., Canton, MA	Inflow	Manhole Repairs	Install mh covers, mh frame and covers (cretex grade rings and internal mh seals	0.047	Removable	Average	131 manhole covers X 26 gpd = 3,406 gpd
Buzzards Bay	2020	2020 Manhole Rehabilitation Specs by Stantec, Performed by Tasco Construction, Inc., Belmont, MA	Inflow	Manhole Repairs	Install mh covers, mh frame and covers (cretex grade rings and internal mh seals	0.050	Removable	Average	141 manhole covers x 26 gpd = 3,666
Buzzards Bay	2019	Dartmouth DPW Records	Inflow	Sump Pump Removal	ID sump pump, letter to home owner, home owner notified Town when disconnected.	0.405	Removable	Average	71 disconnections x 86 gpd = 6,106 gpd
Total									**0.0691 MGD**

[1]SSES reports and/or post-rehab monitoring data should be the primary data sources for completing this table. Please consult with DEP if using an alternate data source.
[2]Example I/I removal activities include main line repairs, service connection repairs, manhole repairs, and sump pump measurements.
[3]Example I/I removal methods include CIPP lining for pipe repairs and frame & cover replacements for manhole repairs.
[4]Please indicate whether the value provided in the SSES report is the estimated volume or the estimated *removable* volume.
[5]Please indicate whether the value provided in the SSES report reflects peak flow (i.e. based on springtime measurements) or annual average flow conditions.

Flag Swamp Road Cranberry Bog Retirement

Information needed for credit calculation:	Acres in Cultivation during baseline period		Water Use (Acre-feet of water/acre/year)		Conversion factor from acre-feet to Million Gallons		Consumptive water use percentage		Days per year		Direct Credits
37 acres Old Style Bog	37 acres	×	10 acre feet of water/acre/year	×	0.325851 million gallons per acre-foot	×	22.5%	÷	365 days	=	0.074 million gallons per day
Total											0.074 MGD

Appendix F: Approved Indirect Credits

Dartmouth's Bylaw Credits		
Local Wetlands Protection Ordinance Updated 09/11	1 credit for enforceability of the bylaw. 1 credit for jurisdiction to resource areas "*whether or not they border surface waters"*. 1 credit for Single and two-family residential recharge and stormwater requirements. .	3 credits
Stormwater Management Ordinance Updated 09/18	1 credit for the geographic extent of the Ordinance (MS4 area only) 2 credits when required to infiltrate 1 inch of runoff 5 credits for regulated project size when projects 5,000 square feet (0.11 acres) and larger are applicable	8 credits
	Total Credits	**11**

Dartmouth's I/I Mitigation Credits		
O&M Plan (1 credit)	• Detailed plan of methods, locations, duration, and frequency • Demonstrated funding availability	1 credit
I/I Analysis (1 credit max)	• I/I Analysis plan developed (1/2 credit) • I/I Analysis study completed with report (1/2 credit)	1 credit
SSES (1 credit max)	• SSES plan developed (1/2 credit) • SSES study completed with report (1/2 credit)	1 credit
Sewer System Rehab (2 credits max)	• Sewer system rehab plan developed (1 credit) • Funding secured and construction dates set (1 credit)	2 credits
	Total Credits	**5**