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

January 6, 2025

Robin A Grimm, Ph.D.
Town Administrator
Town of Sturbridge
308 Main Street
Sturbridge, MA 01566

RE: Sturbridge-BWR\WMA
PWS Number: 2287000
WMA Permit #9P2-2-09-287.01
Action: Permit Renewal

Dear Dr. Grimm:

Please find the attached documents:

- Findings of Fact in Support of the Final Modified Permit #9P2-2-09-287.01; and
- Water Management Act Permit #9P2-2-09-287.01 (Quinebaug River Basin) for the Town of Sturbridge.

The signature on this cover letter indicates formal issuance of the attached document. If you have any questions regarding this information, please contact Jennifer D'Urso at jen.durso@mass.gov or me at (617) 780-1962 or via e-mail at duane.levangie@mass.gov.

Very truly yours,

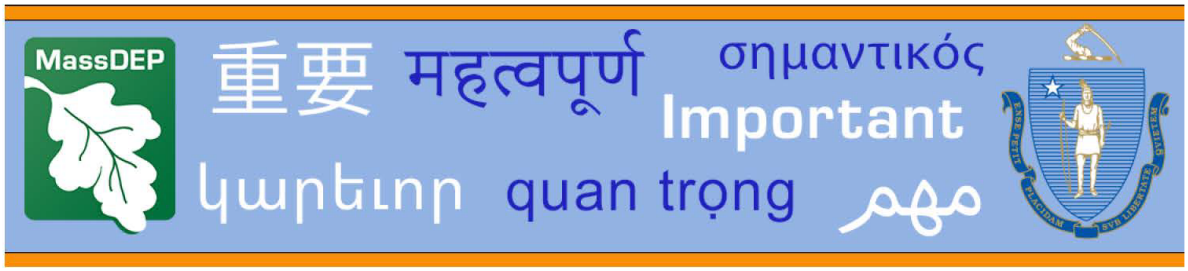
Duane LeVangie

Duane LeVangie, Chief
Water Management Program
Bureau of Water Resources

Ecc: Jennifer Pederson, MWWA
Lydia Olson, Massachusetts Rivers Alliance
Anne Carroll, Department of Conservation and Recreation-Office of Water Resources
Marielle Stone, MassDEP CERO
Todd Richards, MassWildlife

Rebecca Quinones, MassWildlife
Shane Moody, Sturbridge
Heather Blakeley, Sturbridge
Robin Grimm, Sturbridge

Sharepoint:\DWPWMA\Permit Renewals\Quinebaug\Sturbridge-2287000-Final WMA Permit-1.6.2025
Sharepoint:\DWPArchive\CERO\Sturbridge-2287000- Final WMA Permit-1.6.2025



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 EJ at the telephone number listed below.

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Este documento es importante y debe ser traducido de inmediato. Si necesita este documento traducido, comuníquese con la Directora de Diversidad de MassDEP al número de teléfono que aparece más abajo.

Português Portuguese

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繁體中文 Chinese Traditional

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼聯絡 MassDEP 多元化負責人。

简体中文 Chinese Simplified

本文件非常重要，应立即翻译。如果您需要翻译这份文件，请用下面列出的电话号码与 MassDEP 的多元化主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradwi l imedyatman. Si ou bezwen dokimar sa a tradwi, tanpri kontakte Direktè Divèsite MassDEP la nan nimewo telefòn endike anba.

Việt Vietnamese

Tài liệu này rất quan trọng và cần được dịch ngay lập tức. Nếu quý vị cần dịch tài liệu này, xin liên lạc với Giám đốc Đa dạng của MassDEP theo các số điện thoại ghi dưới đây.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះគឺសំខាន់ហើយគួរត្រូវបានបកប្រែភ្លាមៗ។ ប្រសិនបើអ្នកត្រូវការឱ្យគេបកប្រែឯកសារនេះ
សូមទាក់ទងមកនាយកផ្នែកពិពិធកម្មរបស់ MassDEP តាមលេខទូរស័ព្ទខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Kel dukumentu li é inpurtánti y debe ser traduzidu imidiatamenti. Se bu meste di kel dukumentu traduzidu, pur favor kontakta Diretor di Diversidádi di MassDEP na numeru abaxu indikadu.

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 4.21.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это важный документ, и он должен быть безотлагательно переведен. Если вам нужен перевод данного документа, пожалуйста, свяжитесь с директором по вопросам многообразия (Diversity Director) компании MassDEP по указанному ниже телефону.

العربية Arabic

هذه الوثيقة مهمة ويجب ترجمتها على الفور. اذا كنت بحاجة الى هذه الوثيقة مترجمة، يرجى الاتصال بمدير التنوع PMassDE على أرقام الهواتف المدرجة أدناه.

한국어 Korean

이 문서는 중요하고 즉시 번역해야 합니다. 이 문서의 번역이 필요하시다면, 아래의 전화 번호로 MassDEP 의 다양성 담당 이사에 문의하시기 바랍니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է և պետք է անմիջապես թարգմանվի:
Եթե Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանել, դիմեք MassDEP-ի բազմազանության տնօրենին ստորև նշված հեռախոսահամարով:

فارسی Farsi Persian

این سند مهم است و باید فورا ترجمه شود.
اگر به ترجمه این سند نیاز دارید، لطفا با مدیر بخش تنوع نژادی MassDEP به شماره تلفن ذکر شده در زیر تماس بگیرید.

Français French

Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, veuillez communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Sofern Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an den Diversity Director MassDEP unter der unten aufgeführten Telefonnummer.

Ελληνική Greek

Το παρόν έγγραφο είναι σημαντικό και θα πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του παρόντος εγγράφου, παρακαλούμε επικοινωνήστε με τον Διευθυντή Διαφορετικότητας του MassDEP στους αριθμούς τηλεφώνου που αναγράφονται παρακάτω.

Italiano Italian

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Język Polski Polish

Dokument ten jest ważny i powinien zostać natychmiast przetłumaczony. Jeśli potrzebujesz przetłumaczonej wersji dokumentu, prosimy o kontakt z dyrektorem ds. różnorodności MassDEP pod jednym z numerów telefonu wymienionych poniżej.

हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका तुरंत अनुवाद किया जाना चाहिए. यदि आपको इस दस्तावेज़ का अनुवाद करने की आवश्यकता है, तो कृपया नीचे सूचीबद्ध टेलीफोन नंबरों पर मासडेप्स डाइवर्सिटी के निदेशक से संपर्क करें.

Contact Deneen Simpson 857-406-0738
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Findings of Fact in Support of a Permit Renewal
Water Management Permit #9P2-2-09-287.01
Town of Sturbridge

The Department of Environmental Protection (the Department or MassDEP) makes the following Findings of Fact in support of the Town of Sturbridge's (Sturbridge or Sturbridge's) attached Renewed Water Management Act (WMA) Permit #9P2-2-09-287.01 and includes herewith its reasons for issuing the Permit and for conditions of approval imposed, as required by M.G.L. c. 21G, § 11.

The Town of Sturbridge Withdrawal Summary

Sturbridge is registered for an average annual daily withdrawal volume of 0.69 million gallons per day (MGD) from Wells #1, #2, #3 and #5. A Water Management Act Permit was issued in July 1996 to authorize a permitted withdrawal volume of 0.27 MGD. In 2003 the registration was modified to include Well #5 as a replacement source for Well #2. Groundwater contamination of Sturbridge's Well #1 was discovered in the early 1980's and that well was removed from service. By 2005, the source of the volatile organic compound contamination had been remediated through a groundwater pump and treat system and Well #1 was placed back in service. Sturbridge was issued an amended permit in January 2007 to add Well #4 as an additional withdrawal location. Sturbridge was authorized through their Permit and Registration to withdraw up to 1.12 MGD.

The Permit Extensions

WMA permits issued during the first 20-year permitting cycle for the Quinebaug River Basin were due to expire on August 31, 2013. 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. The expiration date for Sturbridge's permit was extended to August 31, 2017. Prior to the expiration date, Sturbridge filed to renew its permit on August 30th, 2016.

Pursuant to M.G.L. c. 30A, § 13, and 310 CMR 36.18(7), the Sturbridge Water Department's existing permit continues in force and effect until the Department issues a final decision on the permit renewal application. The expiration date for all permits going forward in the Quinebaug River Basin will be August 31, 2033, in accordance with the staggered permitting schedule set forth in the regulations.

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

The Water Management Act (Act) requires the Department to issue permits that balance a variety of factors including without limitation:

- Impact of the withdrawal on other water sources;
- Water available within the safe yield of the water source;
- Reasonable protection of existing water uses, land values, investments and enterprises;
- 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, MassDEP 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, MassDEP 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 Quinebaug River Basin section of this document or for more information on the Safe Yield methodology, go to the November 28, 2012 SWMI Framework Summary and Appendices);
- Water needs forecasts for public water suppliers developed by the 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 standards reviewed and approved by the WRC in July 2018 (https://www.mass.gov/doc/massachusetts-water-conservation-standards-2)/ 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; and
- Environmental protections developed through SWMI, including without limitation;
  - protection for coldwater fish resources;
  - minimization of withdrawal impacts in areas stressed by groundwater use; and
  - mitigation of the impacts of increasing withdrawals.

Safe Yield in the Quinebaug River Basin

This permit is being issued under the safe yield methodology adopted by the MassDEP 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 calculation for the Quinebaug River Basin is 33.9 MGD, and total registered and permitted withdrawals are 5.63 MGD. Sturbridge's WMA Permit removes their permitted volume, thus reducing the total registered and permitted withdrawals to 5.20 MGD, and not causing an exceedance of the Quinebaug River Basin's safe yield.

Findings of Fact for Special Permit Conditions in the Town of Sturbridge's Water Management Act Permit

The Findings of Fact for the special conditions included in the permit generally describe the rationale and background for each special condition in the WMA 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 CONDITIONS

Special Condition 1, Authorized Annual Average Withdrawal Volume, recognizes the 0.69 MGD Sturbridge is authorized to withdraw from its ground water sources in the Quinebaug River Basin by its WMA Registration #20928701. The reduced allocation reflects the removal of the 0.43 MGD previously authorized through this permit. Since the permit includes no additional allocation above their registered volume, any withdrawals beyond their registered rate of 0.69 MGD, plus the 0.1 MGD permitting threshold will require Sturbridge to obtain a new permit. As shown in Table 1, Sturbridge's annual average daily volume in recent years has been substantially below 0.69 MGD.

Table 1: Sturbridge System-Wide Water Withdrawals 2017-2023

Withdrawal Basin	Actual Withdrawals (MGD)							Registered Volume (MGD)	Permitted Volume (MGD)	Total Allocation (MGD)
	2017	2018	2019	2020	2021	2022	2023			
Quinebaug	0.52	0.51	0.50	0.47	0.46	0.53	0.51	0.69	0.0	0.69

Special Condition 2, Maximum Daily Withdrawals from Withdrawal Points Withdrawals from individual withdrawal points are not to exceed the approved maximum daily volumes listed below

without specific advance written approval from the Department. The authorized maximum daily rate is based on the approved Zone II rate.

Special Condition 3, Zone II Delineations. Sturbridge's permitted groundwater sources has an approved Zone II. No further Zone II work is required as a condition of Sturbridge's WMA Permit.

Special Condition 4, Wellhead Protection. Department records indicate that the protections in place for Sturbridge's wells meet the requirements of 310 CMR 22.21(2), therefore, no further wellhead protection work is required.

Special Condition 5, Stream Discharge Monitoring and Well #4 Operation. In 2021 and 2022, Sturbridge operated Well #4 under conditions developed in coordination with the Massachusetts Fisheries and Wildlife (FEW) to evaluate impacts on Hamant Brook from the operation of Well #4. Operational conditions were developed in response to that monitoring based on input from Sturbridge and FWE. In general, the operation of Well 4 from June 1 - September 30 is controlled by the drought status of the Central Drought Region of the Massachusetts Drought plan (status can be listed as Level 0 – Normal; Level 1 - Mild Drought; Level 2 - Significant Drought9; Level 3 - Critical Drought; and Level 4 - Emergency Drought), and the streamflow values as measured at USGS streamflow gage #01175670 on the Seven Mile River near Spencer, MA. The Massachusetts Drought Plan can be found at: Drought Management Plan | Mass.gov.

Special Condition 6, Performance Standard for Residential Gallons Per Capita Day (RGPCD) Water Use.
The RGPCD required for all public water suppliers (PWSs) is 65. Permittees that cannot meet this performance standard within the timeframe in the permit must meet the Functional Equivalence Requirements outlined in Appendix A. As shown in Table 2, Sturbridge has consistently met this Performance Standard for the years 2017 thru 2023.

Table 2: Residential Gallons Per Capita Day Water Use

Year	2017	2018	2019	2020	2021	2022	2023
RGPCD	39	41	50	52	45	43	45

Special Condition 7, Performance Standard for Unaccounted for Water (UAW). The UAW percentage required for all PWSs is 10%. Permittees that cannot meet this performance standard within the timeframe in the permit must meet the Functional Equivalence Requirements outlined in Appendix B. As shown in Table 3, Sturbridge has consistently met this Performance Standard for the years 2017 thru 2023.

Table 3: Unaccounted for Water

Year	2017	2018	2019	2020	2021	2022	2023
UAW	3%	3%	2%	3%	4%	8%	7%

Special Condition 8, Water Conservation Requirements. This Special Condition incorporates the Water Conservation Standards for the Commonwealth of Massachusetts reviewed and approved by the

Water Resources Commission in July 2018 (https://www.mass.gov/doc/massachusetts-water-conservation-standards-2/).

Special Condition 9, Seasonal Limits on Nonessential Outdoor Water Use. This Special Condition reflects the restrictions on nonessential outdoor water use from May through September. The options outlined in this Special Condition are based on whether reported RGPCD for the previous year was in compliance with the RGPCD Performance Standard (see Special Condition 6, Performance Standard for RGPCD). In addition, outdoor water use by suppliers with wells in August net groundwater depleted subbasins[1] is limited to 1or 2 days per week to minimize withdrawals from depleted subbasins.

Each year Sturbridge may choose one of two options for implementing nonessential outdoor watering restrictions.

- **Calendar triggered restrictions** are in place from May 1st through September 30th. Many public water suppliers find this option easier to implement and enforce than the streamflow triggered approach
- **Streamflow triggered restrictions** are 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 commence when streamflow falls below the trigger for three consecutive days. Once implemented, the restrictions remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for seven consecutive days.

If Sturbridge selects the streamflow trigger approach, it has been assigned USGS stream #01123600 – Quinebaug River below the Westville Dam. The May-June streamflow trigger is 89 cubic feet per second (cfs), and the July-September streamflow trigger is 48 cfs. Should the reliability of flow measurement at this be so impaired as to question its accuracy, Sturbridge may request that MassDEP review and approve the transfer to another gage that will trigger restrictions. MassDEP reserves the right to require use of a different gage.

- **The 7-Day Low Flow Trigger**, at which restrictions increase, is incorporated into both Calendar and Streamflow Triggered restrictions in order to provide additional protection to streamflows when flows are very low. The 7-day low flow trigger for Sturbridge is 18 cfs.

Sturbridge may choose to implement limits on nonessential outdoor water use that are stricter than those required by the permit.

Special Condition 10, Reporting Requirements, ensures that the information necessary to evaluate compliance with the conditions included herein is accurately reported.

[1] Subbasins used for WMA permitting are the 1,395 subbasins delineated by the U.S. Geological Survey in *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover, and Water Quality for Massachusetts Stream Basins* (Weiskel *et al.*, 2010, USGS SIR 2009-5272). The Water Management Regulations, 310 CMR 36.03, define August net groundwater depletion (NGD) to mean the unimpeded median flow for August minus 2000-2004 groundwater withdrawals plus 2000-2004 groundwater returns described by U.S. Geological Survey in *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover and Water Quality for Massachusetts Stream Basins.* A subbasin is groundwater, depleted if it has an August NGD of greater than 25%.

Other Potential Permit Requirements

Cold Water Fish Resources (CFR).

Permittees with withdrawals that impact streamflow at a CFR (identified on basin maps[2]) must evaluate reducing impacts to CFRs through feasible optimization. The impact of Sturbridge's source in Subbasin 25034 on Hamant Brook, a CFR, was monitored during the summer of 2021 and 2022 in coordination with the Massachusetts Division of Fisheries and Wildlife (DFW). MassDEP in consultation with DFW determined the operating conditions for Well 04G included in Special Condition #5 minimize the impacts of the withdrawals on the CFR, Hamant Brook.

Minimization.

Permittees with groundwater sources in subbasins having an August Net Groundwater Depletion (NGD)[3] of 25% or greater are required to develop a plan to minimize the impacts of their withdrawals. Sturbridge permitted sources are located in subbasins that do not have a August NGD greater than 25% (subbasins 25050, 25033, and 25034). As a result, Sturbridge is not required to develop and implement a minimization plan.

Mitigation.

Sturbridge's permit has been amended to remove their permitted volume, thus no increase in allocation above their registered volume (0.69 MGD) is authorized. Because the permit no longer authorizes withdrawals beyond Sturbridge's baseline volume of 0.72 MGD, which is based on Sturbridge's actual withdrawals in 2005 plus 5%, no mitigation is required.

Response to Comments

Comments on the Draft permit were received from the Massachusetts River Alliance (MRA) in a letter dated 11/11/24, and the Town of Sturbridge, in an email dated 10/8/24. Below is a summary of MassDEP's response to those comments. Comments pertaining to the safe yield methodology used in permitting, data deficiencies, or implementation policies developed as part of the Sustainable Water Management Initiative (SWMI) are not within the scope of individual Water Management permits. MassDEP continues to work with all constituents to review programmatic requirements in forums outside of the development of individual permits. Comments on regulatory and policy issues and comments addressing modifications that are not aligned with current regulations are not included in this Finding of Fact.

Comment: Because none of the subbasins are August NGD, the Town of Sturbridge is not required by the Draft Permit to develop and implement a minimization plan to address water withdrawals from August NGD subbasins. To prevent increasing damage to the subbasins being impacted by well

[2] Subbasins used for WMA permitting are the 1,395 subbasins delineated by the U.S. Geological Survey in *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover, and Water Quality for Massachusetts Stream Basins* (Weiskel *et al.*, 2010, USGS SIR 2009-5272).

[3] The Water Management Regulations, 310 CMR 36.03, define August net groundwater depletion to mean the unimpeded median flow for August minus 2000-2004 groundwater withdrawals plus 2000-2004 groundwater returns described by U.S. Geological Survey in *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover and Water Quality for Massachusetts Stream Basins.*

withdrawals, we urge MassDEP to impose minimization requirements for Sturbridge to directly improve streamflow and habitat conditions in the affected subbasins.

Response: Minimization is not required for PWSs when the subbasins where withdrawals are located are less than 25% August NGD. It should be noted that from 2017 to 2023 Sturbridge averaged 48 RGPCD, which is below the Massachusetts Performance Standard of 65 RGPCD. In addition, Sturbridge's UAW over the same period averaged 4.6%, below the Massachusetts Performance Standard of 10%. In this new permit, the permitted withdrawal volume has been reduced from 0.43 MGD to 0.0 MGD, thus allocating no more water than is registered to Sturbridge.

Sturbridge is already performing the following activities:

- Requiring High-efficiency WaterSense-labeled products and Energy Star-labeled appliances in new construction and renovations;
- Billing quarterly;
- Sturbridge has established penalties and fines for stealing water;
- Sturbridge has an automated remote meter reading system that indicates leaks at the meters and compares flow to historical average usage.
- A list is posted on their website quarterly after the reading of the meters identifying accounts with possible leaks and a second list of all the higher than normal usage accounts.
- Their website has information on how to find leaks and likely leaking locations (sinks, toilets) and on what normal usage is per size of family.

While Sturbridge is not required to minimize, the above activities would be considered elements of a minimization plan. The Department does not believe that additional requirements should be included at this time.

Comment: The Department of Fisheries and Wildlife (DFW) indicated that the pumping of Well 04G on Hamant Brook had minimal impacts. However, DFW recommended the following to ensure there are no adverse effects on the CFR in Hamant Brook:

1. "We recommend that conditions are monitored in Hamant Brook throughout the summer seasons with a transponder monitoring water levels at Station 2 from Jun. 1-Sept. 30."
2. "In summer months (June 1-September 30) with regional drought status levels 0-3: The pump may be operated in 5 days on/5 days off cycles at a maximum rate of ~0.45 MGD. MGD ranged from 0.119 to 0.464 in summer 2022. "On" days should not exceed 5 consecutive days. "Off" days will be for a minimum of 5 consecutive days."
3. "In summer months with regional drought status level 4 or if Station 2 water levels fall below 0.4 ft of first reading taken on June 1: Town will use other sources of water instead of Well no. 4."

None of these recommendations were included explicitly in the Draft Permit for the Town of Sturbridge. We ask that MassDEP include the full conditions as requirements in the permit, especially the monitoring conditions. We also recommend that a switch from a streamflow trigger to a calendar trigger be put into effect for Sturbridge.

Response: Upon comparison of the water levels at the Seven Mile River gage and Hamant Brook stations, DFW determined that Seven Mile River flows at and above 1.64 cfs (for the duration outlined by the permit) resulted in indiscernible water level changes in Hamant Brook during use of the

well. Additionally, the timing of the study provided a good reference point for establishing measures to conserve both water levels and temperatures under drought conditions. DFW believes the permit as written will protect conditions in Hamant Brook to retain its function as a coldwater stream. In addition, all public water suppliers (PWS) are provided with two options to implement outdoor water use restrictions – by using either a streamflow trigger, or a calendar trigger. Limiting one PWS to one option would unfairly limit that PWS in comparison to all others.

Comment: On page 4, under Metering, item #3. "Sturbridge shall continue the meter replacement program that began in 2021 until all residential, industrial, and commercial meter have been replaced no later than May 30, 2026." Sturbridge identified that this condition is not accurate. The Town's meter replacement program began in 2012 and was completed in 2019. Meters continue to be replaced on an as needed basis. Because the Town does not have an issue with unaccounted for water they requested a delay in any new meter program to start for another five years.

Response: The above item has been replaced with the following language in accordance with the Massachusetts 2018 Water Conservation Standards: "The Town of Sturbridge completed a meter replacement program in 2019. The Town shall begin to implement a water meter repair/replacement policy and program, including a budget for the calibration, repair, and replacement of all sources of supply and distribution network water metering systems by 12/31/2025. Consult American Water Works Association (AWWA) Manual M6 "Water Meters Selection, Installation, Testing, and Maintenance" for guidance."

Comment: On page 4, under Pricing, item #3. "Sturbridge will continue to implement an increasing block rate structure." The Town has been in the process of completing an Asset Management study for both water and sewer. Once completed (2025) this will allow us to have an accurate Capital plan to complete the Rate Study with recommendation for an increasing block rate structure.

Response: The above item has been replaced with the following language in accordance with the Massachusetts 2018 Water Conservation Standards: Sturbridge shall adopt rate structures that encourage efficiency in essential water use and reduction of nonessential water use by 12/31/2026."

Finally, in Special Condition #9, the section defining Nonessential Outdoor Water Use and Water Use Restrictions was updated to include the definition of Nonessential use which was added to the WMA regulations (310 CMR 36.00) in 2023.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

WATER WITHDRAWAL PERMIT
##9P2-2-09-287.01
Town of Sturbridge

This permit is issued 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 permit conveys no right in or to any property beyond the right to withdraw the volume of water for which it is issued.

PERMIT NUMBER: 9P2-2-09-287.01 **RIVER BASIN:** Quinebaug River

PERMITTEE: Town of Sturbridge

EFFECTIVE DATE: January 6, 2025
EXPIRATION DATE: August 31, 2033

NUMBER OF WITHDRAWAL POINTS: 5
Groundwater: 5
Surface Water: 0

USE: Public Water Supply

DAYS OF OPERATION: 365

Table 1: Withdrawal Point Identification	
Source Name	**Source Code**
Well #1	2287000-01G
Well #3	2287000-03G
Well #4	2287000-04G
Well #5	2287000-05G

SPECIAL CONDITIONS

1. Maximum Authorized Annual Average Withdrawal Volume

This permit authorizes the Sturbridge Water Department (Sturbridge or the Town) to withdraw water from the Quinebaug River Basin at the rate described below in Table 2. No additional withdrawal volume is authorized by this permit above the 0.69 million gallons per day authorized to Sturbridge under Water Management Act Registration #20928701. The authorized withdrawal volume is expressed both as an annual 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 of the permit term. The Department of Environmental Protection (MassDEP) will use the raw water withdrawal volume from all authorized withdrawal points to assess compliance with the registered and permitted withdrawal volumes.

Table 2: Authorized Withdrawals

Permit Periods	Raw Water Withdrawal Volumes			
	Permit		Registration + Permit	
	Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
1/6/2025 to 8/31/2028	0.0	0.0	0.69	251.85
9/1/2028 to 8/31/2033	0.0	0.0	0.69	251.85

2. Maximum Authorized Daily Withdrawals from Withdrawal Points

Withdrawals from permitted withdrawal points are not to exceed the approved maximum daily volumes listed below without specific advance written approval from MassDEP (Table 3).

Table 3: Maximum Authorized Daily Withdrawal Rates

Source Name	Source Code	MGD
Well #1	2287000-01G	0.734
Well #3	2287000-03G	0.720
Well #4	2287000-04G	0.468*
Well #5	2287000-05G	0.491

* See operating conditions outlined in Special Condition #5- Stream Discharge and Well #4 Operation.

3. Zone II Delineation

MassDEP records show that Sturbridge has approved Zone II delineations for its groundwater sources. Therefore, no further Zone II delineation work is required.

4. Wellhead Protection

MassDEP records show that Sturbridge has successfully adopted local zoning and non-zoning controls that prohibit all uses and activities cited in the MA Wellhead Protection Regulations. Therefore, no further wellhead protection work is required.

5. Stream Discharge Monitoring and Well #4 Operation

From May 1 to September 30, the use and operation of Well #4 is limited by the following operating parameters: streamflow values as measured at USGS streamflow gage #01175670 on the Seven Mile River near Spencer, MA and the drought status of the region (Central Region) with Sturbridge's withdrawal points.

- When the gage is at or below its August median daily streamflow of 1.64 cfs for three consecutive days, pumping of Well #4 will be shut off for a minimum of five consecutive days. Alternatively, Well #4 may be returned to service after shut-off for a maximum of five consecutive days with pumping limited to no more than 0.45 MGD. These operating limits shall remain until the median daily streamflow exceeds 1.64 cfs for seven consecutive days.
- When daily median streamflow exceeds 1.64 cfs for seven consecutive days, pumping may return to seven days a week at the maximum daily withdrawal volume (0.468 MGD).
- When a Level 4 (Emergency Drought) is declared by the Secretary of Energy and Environmental Affairs for Sturbridge's drought region (Central Region), county or watershed, withdrawals at Well #4 shall be suspended until the drought level declaration drops to a Level 3 (Critical drought) or lower drought.

6. Performance Standard for Residential Gallons Per Capita Day Water Use

For all public water suppliers (PWSs), the performance standard for RGPCD is 65. Permittees that cannot comply with the RGPCD Performance Standard are required to develop and implement a functional equivalence program as set forth in Appendix A: Functional Equivalence with the RGPCD Performance Standard. Sturbridge shall report its RGPCD annually in its Annual Statistical Report (ASR).

7. Performance Standard for Unaccounted for Water (UAW)

For all public water suppliers (PWSs), the performance standard for UAW is 10% or less of overall water withdrawal for 2 of the most recent years 3 throughout the permit period. Permittees that cannot comply with the UAW Performance Standard are required to develop and implement the functional equivalence requirements based on the *AWWA/IWA Water Audits and Loss Control Programs, Manual of Water Supply Practices M36,* as outlined in Appendix B. Sturbridge shall report its UAW annually in its Annual Statistical Report (ASR).

Nothing in the permit shall prevent a permittee who meets the 10% performance standard from demonstrating compliance with the UAW performance standard by developing and implementing a water loss control program following the *AWWA M36 Water Audits and Loss Control Programs*.

8. Water Conservation Requirements

At a minimum, Sturbridge shall implement the following conservation measures forthwith. Compliance with the water conservation requirements shall be reported to MassDEP upon request, unless otherwise noted in Table 4.

Table 4: 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 the last documented leak detection survey.

2. Conduct leak detection of the entire distribution system within one year whenever the percentage of UAW 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, submit to the Department a report detailing the 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. Sturbridge shall have repair reports available for inspection by MassDEP. Sturbridge shall establish a schedule for repairing leaks that is at least as stringent as the following: • Leaks of 3 gallons per minute or more shall be repaired within 3 months of detection. • Leaks of less than 3 gallons per minute at hydrants and appurtenances shall be repaired as soon as possible. • Leaks of less than 3 gallons per minute shall be repaired in a timely manner, but in no event more than 6 months from detection, except that leaks in freeway, arterial or collector roadways shall be repaired when other roadwork is being performed on the roadway. Leaks shall be repaired in accordance with Sturbridge's priority schedule including leaks up to the property line, curb stop or service meter, as applicable. Sturbridge shall have water use regulations in place that require property owners to expeditiously repair leaks on their property.
Metering
1. Sturbridge shall continue to calibrate all source and finished water meters at least annually and report date of calibration on the ASR.
2. Sturbridge shall maintain its system as 100% metered.
3. The Town of Sturbridge completed a meter replacement program in 2019. The Town shall begin to implement a water meter repair/replacement policy and program, including a budget for the calibration, repair, and replacement of all sources of supply and distribution network water metering systems by 12/31/2025. Consult American Water Works Association (AWWA) Manual M6 "Water Meters Selection, Installation, Testing, and Maintenance" for guidance.
Pricing
1. Sturbridge shall have a plan and schedule for establishing and maintaining a water pricing structure that includes the full cost of operating the water supply system. Thereafter, Sturbridge shall implement the plan and schedule as approved by MassDEP. Full cost pricing factors all costs - operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) - into prices.
2. Evaluate rates at a minimum every three to five years and adjust costs as needed.
3. Sturbridge shall adopt rate structures that encourage efficiency in essential water use and reduction of nonessential water use by 12/31/2026.
4. Sturbridge shall continue to bill at least quarterly.
Residential and Public Sector Conservation
1. Sturbridge shall ensure that the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code are met when buildings are constructed or renovated.
2. Sturbridge reports metering water used by contractors using fire hydrants for pipe flushing and construction and shall continue to do so.

Industrial and Commercial Water Conservation
1. Sturbridge shall continue to inspect industrial facilities and recommend the use of separate meters for process water where appropriate.
Public Education and Outreach
1. Within thirty days of the effective date of this permit, Sturbridge shall submit to MassDEP a plan and schedule for the development and implementation of a water conservation education and outreach plan designed to educate customers on ways to conserve water. Without limitation, the plan may include the following actions: • Include in bill stuffers and/or bills, a work sheet 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; • Public service announcements; radio/T.V./audio-visual presentations; • Joint advertising with hardware stores to promote conservation devices; • 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 • Provide multilingual materials as needed.
2. Thereafter, Sturbridge shall develop and implement the water conservation education and outreach plan and schedule as approved by MassDEP. Upon request of MassDEP, Sturbridge shall report on its public education and outreach efforts.

9. Seasonal Limits on Nonessential Outdoor Water Use

Sturbridge shall limit nonessential outdoor water use through mandatory restrictions from May 1st through September 30th as outlined in Table 5. To the extent feasible all summer outdoor water use should take place before 9 am and after 5 pm when evaporation and evapotranspiration rates are lower.

TABLE 5: Sturbridge Seasonal Limits on Nonessential Outdoor Water Use
May 1 to September 30

For Permittees meeting the 65 RGPCD Standard for the preceding year RGPCD ≤ 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	Nonessential outdoor water use is allowed: a) **Seven (7) days per week** before 9 am and after 5 pm; **and** b) **One (1) day per week** before 9 am and after 5 pm when USGS stream gage 01123600 – Quinebaug River below the Westville Dam, falls below **18 cfs** for three (3) consecutive days. Once streamflow triggered restrictions are implemented, they shall remain in place until streamflow at the gage meets or exceeds 18 **cfs** for seven (7) consecutive days.
Streamflow Triggered Restrictions	Nonessential outdoor water use is allowed **seven (7) day per week** before 9 am and after 5 pm when USGS stream gage 01123600 – Quinebaug River below the Westville Dam falls below: a) May 1 – June 30: **89 cfs** for three (3) consecutive days b) July 1 – September 30: **48 cfs** for three (3) consecutive days c) **one (1) day per week** before 9 am and after 5 pm

	when USGS stream gage 01123600 – Quinebaug River below the Westville Dam falls below **18 cfs** for three (3) consecutive days. Once implemented, the restrictions shall remain in place until streamflow at the gage meets or exceeds the trigger streamflow for seven (7) consecutive days.
For Permittees NOT meeting the 65 RGPCD standard for the preceding year RGPCD > 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	Nonessential outdoor water use is allowed: a) **Two (2) days per week** before 9 am and after 5 pm; **and** b) **One (1) day per week** before 9 am and after 5 pm when USGS stream gage 01123600 – Quinebaug River below the Westville Dam falls below **18 cfs** for three (3) consecutive days. Once streamflow triggered restrictions are implemented, they shall remain in place until streamflow at the gage meets or exceeds **18 cfs** for seven (7) consecutive days
Streamflow Triggered Restrictions	Nonessential outdoor water use is allowed t**wo (2) day per week** before 9 am and after 5 pm when USGS stream 01123600 – Quinebaug River below the Westville Dam, Southbridge, MA falls below: d) May 1 – June 30: **89 cfs** for three (3) consecutive days e) July 1 – September 30: **48 cfs** for three (3) consecutive days c) **one (1) day per week** before 9 am and after 5 pm when USGS stream gage gage 01123600 – Quinebaug River below the Westville Dam falls below 18 **cfs** for three (3) consecutive days. Once implemented, the restrictions shall remain in place until streamflow at the gage meets or exceeds the trigger streamflow for seven (7) consecutive days.

Instructions for Accessing Streamflow Website Information
If Sturbridge chooses Streamflow Triggered Restrictions, Sturbridge shall be responsible for tracking streamflows and recording and reporting to MassDEP when restrictions are implemented.
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, permittees 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 gage 01123600 – Quinebaug River below the Westville Dam, MA. • Click on the gage number. • Click on Legacy real-time 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 "00060 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.
Sturbridge shall document compliance with the Seasonal Nonessential Outdoor Water Use Restrictions annually in its Annual Statistical Report (ASR) and indicate whether it anticipates implementing calendar triggered restrictions or streamflow triggered restrictions during the next year.

Nonessential Outdoor Water Use and Water Use Restrictions

Nonessential Outdoor Water Use means a use that is not required:

(a) for health or safety reasons, including public facilities used for cooling such as splash pads and swimming pools, and for washing of boats, engines, or marine equipment to prevent negative saltwater impacts or the transfer of invasive aquatic species;
(b) by permit, license, statute or regulation;
(c) for the production of food, including vegetable gardens, and fiber;
(d) for the maintenance of livestock;
(e) to meet the core functions (those functions essential to the commercial operations) of a business, including but not limited to:
1. plant nurseries as necessary to maintain stock;
2. golf courses as necessary to maintain greens and tees, and limited fairway watering per 310 CMR 36.07(2)(c)2.a. through c.;
3. venues used for weddings or similar special events that limit watering to hand-held hose or drip irrigation as necessary to maintain gardens, flowers and ornamental plants;
4. professional washing of exterior building surfaces, parking lots, driveways and/or sidewalks as necessary to apply surface treatments such as paint, preservatives, stucco, pavement, or cement in the course of construction, reconstruction or renovation work;
(f) for irrigation of public parks before 9:00 A.M. and after 5:00 P.M.,
(g) for irrigation of public and private recreation fields, including those operated by schools, colleges, universities and athletic associations, before 9:00 A.M. and after 5:00 P.M.,
(h) for irrigation of publicly-funded shade trees and trees in the public right-of way; or
(i) to establish a new lawn as necessary to stabilize soil in response to new construction or following the repair or replacement of a Title 5 system.

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:

- irrigation to establish a new lawn and new plantings during the months of May and September; and

- irrigation of lawns, gardens, flowers, and ornamental plants by means of a hand-held hose.

Public Notice of Seasonal Nonessential Outdoor Water Use Restrictions
Sturbridge shall notify its customers of the restrictions and the consequences of failing to adhere to the restrictions.

- For calendar-triggered restrictions, customers shall be notified by April 15th each year.
- For streamflow-triggered restrictions, when streamflow at the assigned USGS local stream gage falls below a streamflow trigger for three consecutive days, customers shall be notified as soon as possible, but within three days of implementing the restrictions.

Notice that restrictions have been put in place shall be filed each year with MassDEP 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's website. Should the reliability of flow measurement at the Quinebaug River gage be so impaired as to question its accuracy, Sturbridge 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.

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

10. Reporting Requirements
Sturbridge 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

Any person aggrieved by this decision may request an adjudicatory hearing on this Permit by timely filing a Notice of Claim for an Adjudicatory Appeal ("Notice of Claim") in accordance with 310 CMR 36.37 and 310 CMR 1.01 within twenty-one (21) days of its receipt of this Permit. The Notice of Claim shall state specifically, clearly and concisely the facts that are grounds for the appeal, the relief sought, and any additional information required by applicable law or regulation. A copy of this Permit shall be included with a Notice of Claim. No request for an appeal of this Permit shall be validly filed unless a copy of the request is sent at the same time 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 Permittee, unless such person notifies the Permittee of the appeal in writing by certified mail or by hand within five (5) days of mailing the appeal to the Department.

The Notice of Claim and supporting documentation 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

In addition, the Department's fee transmittal form, together with a valid check made payable to the Commonwealth of Massachusetts in the amount of $100 for the appeal filing fee, if required, must be mailed to:

Commonwealth of Massachusetts Lock Box
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

The Notice of Claim may be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver.

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

1/6/2025

Duane LeVangie
Water Management Program Chief
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 by December 31, 2023, in its 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 topsoil 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: 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 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 of failing to meet the standard as follows:

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, 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.
3. Within 5 full calendar years of failing to meet the standard, submit the component analysis and water loss control program with a proposed implementation schedule to the Department.
4. Continued implementation will be a condition of the permit in place of meeting the 10% UAW performance standard.
5. 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 the Department, 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 final 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: If the permittee is required to develop a Functional Equivalence Plan for the 10% Unaccounted for Water Performance Standard, and the permittee does not have a MassDEP-approved Water Loss Control Program in place within 5 full calendar years of failing to meet the standard, the permittee 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.

A permittee's hardship analysis shall:

- Document economic hardship and present an analysis demonstrating that implementation of specific measures will cause or exacerbate significant economic hardship;
- Present reasons why specific measures are not cost-effective because the cost would exceed the costs of alternative methods of achieving the appropriate standard; and
- Propose 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 Water Loss Control Measures.

MassDEP will review a permittee's detailed, written analysis to determine whether unique circumstances make specific Best Management Practices (BMPs) less cost-effective than alternatives, or infeasible for the permittee.