

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

February 9, 2018

Board of Selectmen
Town of Norwell
345 Main Street
Norwell, MA 02061

RE: NORWELL – BRP/WMA
PWS ID# 4219000
WMA Permit #9P4-4-21-219.01
FINAL Permit Renewal

Dear Selectmen:

Please find attached the following:

- Findings of Fact in Support of the Final Renewed Permit and;
- Final Renewed Water Management Act Permit # 9P4-4-21-219.01 for the Town of Norwell, Massachusetts

If you have any questions regarding this information, please contact Richard Friend at (617) 654-6522 or at richard.friend@state.ma.us.

Sincerely,

Rebecca Weidman
Director, Division of Watershed Management
Bureau of Water Resources

Cc: Greg McBride, Norwell Board of Selectmen
Steve Ivas, Norwell Water Commission

ecc:

Peter Dillion, Norwell Board of Water Commissioners
John McInnis, Norwell Water Dept.
Neal Merritt, Hanover DPW
Jennifer Pederson, MWWA
Samantha Woods, North & South Rivers Watershed Association
Michelle Cradock, DFW
Emily Holt, DFW
Duane LeVangie, MassDEP
Jason Federico, Polaris Consulting

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Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)

Contact Michelle Waters-Ekanem, Diversity Director/Civil Rights: 617-292-5751 TTY#

MassRelay Service 1-800-439-2370.

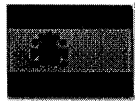
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(Version 3.30.15)



1 English:

This document is important and should be translated immediately. If you need this document translated, please contact MassDEP's Diversity Director at the telephone numbers listed below.



2 Español (Spanish):

Este documento es importante y debe ser traducido inmediatamente. Si necesita este documento traducido, por favor póngase en contacto con el Director de Diversidad MassDEP a los números de teléfono que aparecen más abajo.



3 Português (Portuguese):

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4(a) 中國（傳統）(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與 MassDEP 的多樣性總監聯繫。



4(b) 中国（简体中文）(Chinese Simplified):

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5 Ayisyen (franse kreyòl) (Haitian) (French Creole):

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradui imedyatman. Si ou bezwen dokiman sa a tradui, tanpri kontakte Divèsite Direktè MassDEP a nan nimewo telefòn ki nan lis pi ba a.



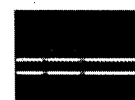
6 Việt (Vietnamese):

Tài liệu này là rất quan trọng và cần được dịch ngay lập tức. Nếu bạn cần dịch tài liệu này, xin vui lòng liên hệ với Giám đốc MassDEP đa dạng tại các số điện thoại được liệt kê dưới đây.



7 ប្រទេសកម្ពុជា (Kmer (Cambodian):

ឯកសារនេះគឺមានសារៈសំខាន់និងគួរត្រូវបានបកប្រែភ្លាមៗ ប្រសិនបើអ្នកត្រូវបានបកប្រែ ឯកសារនេះសូមទំនាក់ទំនងភ្នាក់ងារជាតិ MassDEP នៅលេខទូរស័ព្ទដែលបានរាយ ខាងក្រោម។



8 Kriolu Kabuverdianu (Cape Verdean):

Es documento é importante e deve ser traduzido imidiatamente. Se bo precisa des documento traduzido, por favor contacta Director de Diversidade na MassDEP's pa es numero indicoe li d'boche.



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Этот документ является важным и должно быть переведено сразу. Если вам нужен этот документ переведенный, пожалуйста, свяжитесь с директором разнообразия MassDEP по адресу телефонных номеров, указанных ниже.



10 العربية (Arabic):

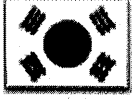
هذه الوثيقة الهامة وينبغي أن تترجم على الفور. إذا كنت بحاجة إلى هذه الوثيقة المترجمة، يرجى الاتصال مدير التنوع في MassDEP على أرقام الهواتف المدرجة أدناه.

Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)

Contact Michelle Waters-Ekanem, Diversity Director/Civil Rights: 617-292-5751 TTY#
MassRelay Service 1-800-439-2370.

<http://www.mass.gov/eea/agencies/massdep/service/justice/>

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11 한국어 (Korean):

이 문서는 중요하고 즉시 번역해야 합니다. 당신이 번역이 문서가 필요하면 아래의 전화
번호로 MassDEP의 다양성 감독에 문의하시기 바랍니다.



12 հայերեն (Armenian):

Այս փաստաթուղթը շատ կարևոր է եւ պետք է թարգմանել անմիջապես. Եթե Ձեզ
անհրաժեշտ է այս փաստաթուղթը թարգմանվել դիմել MassDEP բազմազանությունը
տնօրեն է հեռախոսահամարների թվարկված են ստորել.



13 فارسی (Farsi (Persian):

این سند مهم است و باید فوراً ترجمه شده است.
اگر شما نیاز به این سند ترجمه شده، لطفاً با ما تماس تنوع مدیر MassDEP در شماره تلفن های ذکر شده در زیر.



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numéros de téléphone indiqués ci-dessous.



15 Deutsch (German):

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Το έγγραφο αυτό είναι σημαντικό και θα πρέπει να μεταφραστούν αμέσως. Αν χρειάζεστε
αυτό το έγγραφο μεταφράζεται, παρακαλούμε επικοινωνήστε Diversity Director MassDEP
κατά τους αριθμούς τηλεφώνου που αναγράφεται πιο κάτω.



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bisogno di questo documento tradotto, si prega di contattare la diversità Direttore di MassDEP
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numery telefonów wymienionych poniżej.



19 हिन्दी (Hindi):

यह दस्तावेज महत्वपूर्ण है और तुरंत अनुवाद किया जाना चाहिए. आप अनुवाद इस दस्तावेज की जरूरत
है, नीचे सूचीबद्ध फोन नंबरों पर MassDEP की विविधता निदेशक से संपर्क करें.



Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

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Findings of Fact in Support of FINAL Water Management Permit #9P4-4-21-219.01 Town of Norwell

The Department of Environmental Protection (the Department) makes the following Findings of Fact in support of the attached Final Water Management Permit #9P4-4-21-219.01, and includes herewith its reasons for issuing the Final Permit and for conditions of approval imposed, as required by M.G.L. c. 21G, § 11. The issuance of this permit is in response to a water withdrawal permit renewal application submitted by the Town of Norwell Water Department, (Norwell) for the purpose of public water supply.

The Department adopted revised Water Management Regulations at 310 CMR 36.00 on November 7, 2014, (described in greater detail below). Since that time, the Department has been working closely with each Water Management Act (WMA) permittee to fully consider all aspects of their individual situations and ensure thoughtful and implementable permits.

The Department met with Norwell's representatives on several occasions regarding the conditions in this permit, in particular the inclusion of seasonal limits on nonessential outdoor water use and the inclusion of 65 gal/day/capita and 10% UAW, all of which are new permit conditions for Norwell.

The Permit Extensions

WMA permits issued during the first 20-year permitting cycle for the South Coastal Basin expired on August 31, 2010. All permittees seeking to renew their Water Management permit were required to file a renewal application on or before May 31, 2010. Norwell filed a timely renewal application and received a one-year Interim Permit, to August 31, 2011, to continue operations while the permit renewal review was ongoing. The Department published notice of the permit renewal application in the Environmental Monitor on June 23, 2010. No comments were received.

Subsequently, 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. In addition, in a letter of September 25, 2015, the Department informed Norwell that the Department would need additional time before making a determination on the application in order to ensure that all permit renewal applicants in the South Coastal 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), Norwell'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 South Coastal Basin will be August 31, 2030, in order to restore 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, 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, 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 South Coastal 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 2006 and revised in June 2012 (<http://www.mass.gov/eea/docs/eea/wrc/water-conservation-standards-rev-june-2012.pdf>), 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;
 - 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;
 - mitigation of the impacts of increasing withdrawals.

Safe Yield in the South Coastal 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 South Coastal Basin is 70.1 million gallons per day (MGD), and total registered and permitted withdrawals are 44.90 MGD, leaving 25.20 MGD potentially available. The maximum withdrawals that will be authorized in this permit, and all other permits currently under review by the Department within the South Coastal Basin, will be within the safe yield and may be further conditioned as outlined in the regulations.

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

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 final 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, reflects the total (registered plus permitted) annual average authorized withdrawal volume from the South Coastal basin and the combined volumes from the South Coastal and Boston Harbor basins. The combined volumes reflect Norwell's water needs forecast prepared by DCR of 1.15 MGD by 2030, plus a 5% buffer of 0.06 mgd.

DCR Water Needs Forecast for Norwell

Years:	2016-2020	2021-2025	2026-2030	2026-2030 + 5% buffer
MGD:	1.11	1.14	1.15	1.21

Special Condition 2, Maximum Authorized Daily Withdrawal Rates reflect the MassDEP-approved Zone II maximum daily pumping rates for Norwell'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 have been met and are up to date as of the issuance of this permit.

Special Condition 5, Monitoring of Third Herring Brook

The MA Division of Ecological Restoration (DER) and North South River Watershed Association monitors flow weekly at four locations on Third Herring Brook through the River Instream Flow Stewards (RIFLS) program. The program has developed a stream-discharge rating curve at Well #1 and has monitored water levels there since the spring of 2015 with a datalogger. Monitoring at the other locations are weekly manual measurements.

Streamflow measured by DER from 2012 to 2016 indicates that streamflow below the Norwell and Hanover wells is impacted by pumping. DER has observed that streamflow in cubic feet per second per square mile of drainage area (cfs/m) is frequently lower downstream of the wells in the summer, presumably because of pumping. Additionally, DER observed periods of zero flow and dry streambed conditions in Third Herring Brook near Well #1 during late summer/early fall in 2015 and 2016. Streamflow depletion in Massachusetts commonly occurs by pumping wells built in glacial sand and gravel valley-fill aquifers such as the one underlying Third Herring Brook.

To improve the level of monitoring while sharing the cost, the Department is proposing that Norwell and Hanover develop a joint monitoring plan of Third Herring Brook since both towns' wells impact the flow in the brook, and both towns have applied to renew their WMA permits. Joint monitoring will reduce the overall cost of monitoring for each town while providing more frequent data collection. The permit

condition is written such that only Norwell is required to develop such a plan, with the expectation that future permit decisions involving Hanover will include similar language.

Special Condition 6, Performance Standard for Residential Gallons Per Capita Day Water for all PWS permittees is 65 gallons. Permittees that cannot comply within the timeframe in the permit must meet Functional Equivalence requirements outlined in Appendix A. Norwell's recent RGPCD values were:

2014	2015	2016
63	59	60

Special Condition 7, Performance Standard for Unaccounted for Water for all PWS permittees is 10%. Permittees that cannot comply within the timeframe in the permit must meet 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. Norwell's recent DEP-reviewed UAW values were:

2014	2015	2016
8.5	8.6	9.7

Special Condition 8, Seasonal Limits on Nonessential Outdoor Water Use reflects the restrictions on nonessential outdoor water from May through September. The options outlined in Special Condition 8 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, because Norwell has at least one source in a subbasin that is greater than 25% August net groundwater depleted, it must minimize withdrawals by limiting outdoor water use to no more than 1 or 2 days per week.

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

The streamflow triggers are based on Aquatic Base Flow (ABF) levels that are protective of aquatic habitat for fish spawning during the spring bioperiod (May-June), and protective of flows for fish rearing and growth during the summer bioperiod (July-September). The flow levels are simulated natural flow values calculated by the Sustainable Yield Estimator (SYE)¹ from index gage flow data which represent the least altered stream flows in Massachusetts, and applied to the assigned local USGS stream gage.

If Norwell selects the streamflow approach, it has been assigned the USGS local stream gage of #01105730 – Indian Head River at Hanover. The local gage streamflow triggers at this site are 31 cubic

¹ Archfield, S.A., Vogel, R.M., Steeves, P.A., Brandt, S.L., Weiskel, P.K., and Garabedian, S.P., 2010, The Massachusetts Sustainable-Yield Estimator: A decision-support tool to assess water availability at ungaged stream locations in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2009–5227, 41 p. plus CD-ROM. See <http://pubs.usgs.gov/sir/2009/5227/>.

feet per second (cfs) for May and June, and 13 cfs for July, August and September. Should the reliability of flow measurement at the Indian Head gage be so impaired as to question its accuracy, Norwell 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.

- **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 is based on the median value of the annual 7-day low flows for the period of record. The 7-day low-flow trigger for the Indian Head River at Hanover gage is **4.9 cfs**.

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

Special Condition 9, Water Conservation Requirements, incorporates the Water Conservation Standards for the Commonwealth of Massachusetts reviewed and approved by the WRC in July 2006 and revised in June 2012. (<http://www.mass.gov/eea/docs/eea/wrc/water-conservation-standards-rev-june-2012.pdf>).

Special Condition 10, Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins, requires permittees with permitted groundwater sources in subbasins² with net groundwater depletion of 25% or more during August to minimize their withdrawal impacts on those subbasins, to the greatest extent feasible, through optimization of groundwater source use, surface water releases to improve streamflow, outdoor water use restrictions and water conservation programs that go beyond standard Water Management permit requirements.

All of Norwell's groundwater sources are located subbasins with August Net groundwater depletion values of greater than 25%. Based on the Department's records and information submitted by Norwell, the Department finds that minimization requirements will be met as follows:

- **Source Optimization** – All of Norwell's South Coastal basin groundwater sources are located in Subbasin 22015, which is greater than 25% August net groundwater depleted (NGD) and all of Norwell's Boston Harbor groundwater sources are in subbasin 21037, which is also more than 25% August NGD. There are no opportunities to optimize because Norwell must make use of all its sources in both subbasins to meet summertime demand, and therefore cannot shift pumping to a less-impacted subbasin in the summer to alleviate impacts. This decision may be revisited based on the redevelopment of existing sources. See Response to Comments below.
- **Surface Water Releases** – Jacobs Pond at the headwaters of Third Herring Brook is the only surface water body with potential for releases. The pond level is managed at its dam to maximize the pond level for recreational purposes. The Third Herring Brook study undertaken by Norwell and Hanover in 2016 included a bathymetric survey of the 60 acre pond and a Water Evaluation and Planning (WEAP) model to simulate the water budget of the Third Herring Brook subbasin. The survey found that the pond is a maximum of 4 to 5 feet deep, with much of the pond only 2 to 3 feet deep. To evaluate the potential for releases, the WEAP model simulated raising the pond by 0.5 feet for part of the year by raising its dam. Although the simulation indicated that no significant increase in outflow would result, additional data collection may shed more light on the potential for releases from the pond. Norwell should continue to evaluate releases from Jacobs Pond as more data become available.

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).

- **Outdoor Water Use Restrictions** – Norwell’s limits on nonessential outdoor water use set forth in Special Condition 8 were developed to minimize withdrawals in subbasins with an August NGD of 25% or more.
- **Conservation** - Appendix G of the June 2016 Third Herring Brook SWMI Grant report prepared by Design Consultants and Bristol Engineering on behalf of Norwell and Hanover, in cooperation with North and South River Watershed Association, summarizes the annual and summertime water use patterns of municipal, commercial and residential customers. The analysis found that a small number of residential users accounted for a relatively high percentage of summertime use. For example the top 1% of users account for approximately 6% of all residential use, and the top 10% of users account for about 28% of use.
- In 2016 Norwell sent letters to its top 113 residential water users informing them that their high water use is either due to leaks or excessive outdoor watering. The permit requires Norwell to continue to monitor and reach out to its high-use residential customers to encourage them to conserve water.

Special Condition 11, Mitigation of Impacts for Withdrawals that Exceed Baseline³, requires mitigation of the impacts of withdrawals above the permittee’s baseline by direct and/or indirect mitigation activities.

- Direct mitigation activities result in enhanced streamflow through
 - Wastewater returns to local groundwater,
 - Surface water releases,
 - Stormwater recharge, or
 - Infiltration and inflow removal from sewer systems.
- Indirect mitigation activities are actions that will help to compensate for streamflow impacts resulting from withdrawals.

Norwell has limited direct mitigation credit opportunities. The town has no sewer system for infiltration/inflow removal, and there are no surface water release options. The town identified several local drainage improvements that potentially qualified for stormwater recharge credits, but the information necessary for quantifying these projects for direct mitigation credits is unavailable.

As outlined in the 2014 Water Management Act Permit Guidance, 1 indirect mitigation credit translates into 0.01 mgd of required mitigation. Norwell has registrations and permits in both the South Coastal and Boston Harbor Basins. Since 2005 the town has purchased 100.5 acres of land for water supply protection and land preservation in both basins that qualify for indirect mitigation credit, 27.6 acres in the South Coastal basin and 72.9 acres in the Boston Harbor basin. The parcels have an indirect mitigation value of 2.76 credits for the South Coastal and 7.90 credits for the Boston Harbor. Appendix C summarizes the purchased parcels and computation of each basin’s mitigation credit.

This permit authorizes Norwell to withdraw up to 1.08 mgd in the South Coastal basin, 0.40 mgd above the baseline rate of 0.68 mgd. The Department assumes that 85% of the water withdrawn above baseline will be returned to the subsurface because wastewater disposal in Norwell is entirely through on-site septic systems and permitted groundwater discharge facilities. After the 85% wastewater return adjustment, 0.06 mgd (15% of 0.40 mgd) of withdrawals above baseline in the South Coastal Basin must be mitigated, equivalent to 6 mitigation credits. The Boston Harbor permit, which is not under review at this time, may be renewed for up to its existing authorized volume of 0.64 mgd, 0.04 mgd above the

³ Baseline is the volume of water withdrawn in 2005 plus 5%, or the average annual volume withdrawn from 2003 to 2005, whichever is greater. Baseline cannot be less than the registered volume, and cannot be more than the authorized volume during the 2003 to 2005 period. For suppliers with authorizations in multiple major basins, baseline is computed for each basin and for the entire system.

baseline of 0.60 mgd, in which case the mitigation volume would be 0.006 mgd (15% of 0.04 mgd), which would require 0.6 mitigation credits.

Land purchased in both basins will be necessary to meet the South Coastal basin mitigation requirement of 6 credits. Norwell purchased land equaling 2.76 credits in the South Coastal Basin, all of which will be used for mitigation in that basin. The remaining 3.24 credits required for the South Coastal mitigation requirement will be from the 7.90 Boston Harbor land credits, leaving 4.66 Boston Harbor mitigation credits that may be available for mitigation requirements in Norwell's Boston Harbor permit when it is renewed.

Below is a summary of the permitted withdrawal rates and mitigation for the South Coastal basin, and the potential permitted withdrawal rates and mitigation for the Boston Harbor permit and for the combined basins. The combined withdrawal rate (1.21 mgd) is less than the sum of the individual basin withdrawal rates (1.72 mgd) because the town is not authorized to withdraw above the DCR water needs forecast (1.21 mgd). Providing separate and combined authorized withdrawal volumes give the town flexibility in how much water it withdraws each year from each basin to meet its needs. This requires the town to meet the mitigation requirements for each basin, rather than for their combined authorized volume.

**Summary of Norwell Authorized Withdrawal Rates,
Baselines and Mitigation Credit Requirements**

	Registered (MGD)	Permitted (MGD)	Authorized (MGD)	Baseline Volume (MGD) ¹	Amount over baseline (MGD)	Amount to Mitigate after Wastewater Adjustment (MGD) ²	Mitigation Credits Required
South Coastal	0.68	0.40	1.08	0.68	0.40	0.06 ³	6
Boston Harbor*	0.32	0.32	0.64	0.60	0.04	0.006	0.6
Combined	1.00	0.40	1.21	1.21	--	--	--

*Boston Harbor values are based on Norwell's initial renewal application.

1. The South Coastal baseline is the registered rate, the Boston Harbor baseline is the 2005 actual use plus 5%, and the combined baseline is the 2005 total use plus 5%. Coincidentally, 1.21 MGD is both the system baseline and the DCR water needs forecast.
2. The volume to be mitigated after adjusting for the wastewater returns through groundwater discharge is 15% of the volume over baseline. The mitigation volumes would be 0.00 mgd if the town limited each basin's withdrawal to their respective baselines. However, for maximum flexibility the town has chosen to renew the South Coastal basin for an authorized volume of 1.08 mgd, requiring 0.06 of mitigation, and has indicated they will apply to renew the Boston Harbor basin for 0.64 mgd, requiring 0.006 mgd of mitigation.
3. The South Coastal maximum mitigation volume of 0.06 MGD applies if the full authorized volume of 1.08 MGD is withdrawn from the South Coastal basin.

Special Condition 12, Requirement to Report Raw and Finished Water Volumes is to assure that the information necessary to evaluate compliance with other permit conditions is accurately reported.

Coldwater Fish Resource Protection was incorporated into the Water Management Regulations in November 2014. Coldwater Fish Resource Protection is not a condition of this permit because Norwell's withdrawals do not impact any waters that MA Division of Fisheries and Wildlife has identified as supporting coldwater fish at this time.

General Permit Conditions – contains general requirements applicable to all WMA permittees.

In the event of any conflict or ambiguity between the preceding Findings and the permit, the permit language shall control.

Response to Comments on the Draft Permit

Comments on the draft permit were filed on October 19, 2017 by Samantha Woods, Executive Director of the North & South Rivers Watershed Association (NSRWA). NSRWA had a number of concerns about the draft permit that were discussed with MassDEP in a conference call on December 21, 2017. The following is a brief summary of the concerns raised and revisions to the permit based on the written comments and the conference call.

NSRWA raised concerns about the application of the Safe Yield methodology developed during the SWMI process that was promulgated in the Water Management Regulations in November 2014. Their concerns stated that applying a Safe Yield calculated for the entire South Coastal basin is not protective of smaller watersheds such as Third Herring Brook's which contains Norwell's supply wells. While NSRWA acknowledged that other conditions in the permit (conservation, mitigation and minimization) are intended to limit degradation, they believe without calculating Safe Yield on a smaller watershed scale the impacts of pumping may outweigh the benefits of the permit conditions.

MassDEP believes the streamflow criteria, and the requirements to develop and implement minimization and mitigation plans address the hydrologic conditions at the subbasin scale (i.e. Third Herring Brook). The minimization condition of the permit requires Norwell to restrict outdoor water use to at most two days per week. Norwell has recently instituted a 4-tiered outdoor water use restriction system that is more restrictive than the permit requires.

NSRWA disagreed with the draft permit's statement that the WEAP hydrologic model (developed by NSRWA in cooperation with the town) indicated that releases from Jacobs Pond were not feasible. Based on our discussions and upon further review, MassDEP agrees with NSRWA that as more data become available, for example from the monitoring of Third Herring Brook required in the permit, the feasibility of releases from Jacobs Pond should continue to be evaluated.

NSRWA identified that Norwell may be rehabilitating an existing supply well(s) more distant from Third Herring Brook that may have less impact on streamflow. If the well is rehabbed, the town should evaluate the feasibility of pumping it more heavily in the spring and summer if it would lessen impacts to Third Herring Brook during the low-flow period of the year. MassDEP may require such an evaluation upon the completion of the rehab process.



Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

FINAL WATER WITHDRAWAL PERMIT MGL c 21G

This FINAL 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: 9P4-4-21-219.01 **RIVER BASIN:** South Coastal

PERMITTEE: Town of Norwell
345 Main Street
Norwell, MA 02061

EFFECTIVE DATE: February 9, 2018

EXPIRATION DATE: August 31, 2030

TYPE AND NUMBER OF WITHDRAWAL POINTS: Groundwater: 6 Surface Water: 0

USE: Public Water Supply

DAYS OF OPERATION: 365

WITHDRAWAL POINT IDENTIFICATION:

Table 1: Withdrawal Point Identification

Source Name	PWS Source ID
Well #1	4219000-01G
Well #4 Replacement	4219000-13G
Well #6 Replacement	4219000-12G
Well #7	4219000-08G
Well #8	4219000-09G
Well #9	4219000-10G

SPECIAL CONDITIONS

1. Maximum Authorized Annual Average Withdrawal Volume

The permitted rates in Table 2 are in addition to the 0.68 MGD authorized to Norwell under WMA Registration #4-21-219.02 for withdrawal from the South Coastal Basin. These rates are expressed both as an average daily withdrawal rate (million gallons per day or MGD), and as a total annual withdrawal rate (million gallons per year or MGY) for each five-year 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 rates.

Table 2: South Coastal Authorized Withdrawal Rates

5-Year Periods		Total Raw Water Withdrawal Volumes			
		Permit		Registration + Permit	
		Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
2/9/2018	8/31/2020	0.40	146.00	0.68 + 0.40 = 1.08	394.20
9/1/2020	8/31/2025	0.40	146.00	0.68 + 0.40 = 1.08	394.20
9/1/2025	8/31/2030	0.40	146.00	0.68 + 0.40 = 1.08	394.20

In addition to the limitations outlined above in Table 2 for the South Coastal, MassDEP further limits system-wide withdrawals from all of Norwell's sources to the volumes in Table 3.

Table 3: Combined Maximum Authorized Annual Withdrawal Volumes from the South Coastal and Boston Harbor River Basins

5-Year Periods		Total Water Withdrawal Volumes	
		Daily Average (MGD)	Total Annual (MGY)
2/9/2018	8/31/2020	1.11	405.15
9/1/2020	8/31/2025	1.14	416.10
9/1/2025	8/31/2030	1.15 + 0.06 buffer= 1.21	441.65

Norwell may increase annual average daily withdrawals to the maximum authorized (1.21 mgd) prior to 2025, if Norwell is meeting the following conditions:

- residential gallons per capita day water use (RGPCD) of 65 or less, or all RGPCD functional equivalence requirements in Special Condition #6;
- unaccounted-for-water use (UAW) of 10% or less, or all UAW functional equivalence requirements in Special Condition #7;
- seasonal limits on nonessential outdoor water use in Special Condition 8; and
- water conservation requirements in Special Condition 9.

2. Maximum Daily Withdrawal Rates

Withdrawals from Norwell's permitted South Coastal Basin sources are not to exceed the approved maximum daily rates listed in Table 4 below without advance approval from MassDEP.

Table 4: Individual Source Maximum Daily Withdrawal Rates

Source Name	PWS Source ID	Maximum Daily Rate (MGD)
GP Well 1	4219000-01G	0.40
Well #4 Replacement	4219000-13G	0.22
Well #6 Replacement	4219000-12G	0.65
GP Well 7	4219000-08G	0.14
GP Well 8	4219000-09G	0.07
GP Well 9	4219000-10G	0.09

3. Zone II Delineation

The Zone II delineations have been approved for the permitted sources. No further Zone II work is required.

4. Wellhead Protection

MassDEP records indicate that Norwell meets the requirements of 310 CMR 22.21(2), therefore, no further wellhead protection work is required.

5. Monitoring of Third Herring Brook

Norwell shall develop a Third Herring Brook monitoring plan to be reviewed and approved by MassDEP and the Massachusetts Division of Ecological Restoration (DER). The monitoring plan will include installation, maintenance and monthly downloading of dataloggers at Jacob's Pond and Third Herring Brook at River Street, which are now monitored manually by DER through their RIFLS program. The monitoring plan will also require installation, maintenance and monthly downloading of a water level sensor and datalogger in the brook near Norwell's Well #1 to measure and record water levels in the brook. The DER program has established a stage-discharge curve at Well #1 and will use the water levels measured and recorded by the town to determine streamflow.

The Third Herring Brook monitoring plan will also include reporting to DEP and DER. All water level data recorded and downloaded from dataloggers will be provided quarterly in electronic format to DER. An annual monitoring report will be submitted along with the town's Annual Statistical Reports (ASRs) to DEP and submitted separately to DER. The report will summarize the water level data from all dataloggers and daily pumping records of all of Norwell's and Hanover's wells in the Third Herring Brook subbasin. The data provided in the annual report will be cumulative, starting from the time when the transducers/dataloggers are installed. The annual report will include an analysis and summary of the water level and streamflow data to assess pumping impacts on streamflow, and will include graphs and tables summarizing the data. Electronic records of the monitoring data will be included with the annual reports or sent separately via email.

Norwell shall submit a proposed monitoring plan to DEP and DER by six months from Permit issuance (August 9, 2018) for review and approval prior to initiating the plan. The installation of dataloggers shall occur within two months of DEP and DER approval, unless delayed due to frozen conditions.

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

The Town of Norwell's performance standard for residential gallons per capita day (RGPCD) is 65 gallons or less. Norwell shall be in compliance with this standard by December 31, 2019, or, if Norwell does not meet the standard, shall be in compliance with the functional equivalence requirements (Appendix A).

7. Performance Standard for Unaccounted for Water

Norwell's Performance Standard for Unaccounted for Water (UAW) is 10% or less of overall water withdrawals for 2 of the most recent 3 years throughout the permit period. Norwell shall be in compliance with this performance standard by December 31, 2020 or, if Norwell does not meet the standard, shall be in compliance with the functional equivalence requirements (Appendix B).

8. Seasonal Limits on Nonessential Outdoor Water Use

Norwell shall limit nonessential outdoor water 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 a.m. and after 5 p.m. when evaporation and evapotranspiration rates are lower.

Table 5: Seasonal Limits on Nonessential Outdoor Water Use

Restrictions if Norwell has met the 65 RGPCD Standard for the preceding year RGPCD ≤ 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	<p>Nonessential outdoor water use is allowed:</p> <ul style="list-style-type: none"> 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 01105730 – Indian Head River at Hanover, MA falls below 4.9 cfs for three (3) consecutive days. <p>Once streamflow triggered restrictions are implemented, they shall remain in place until streamflow at the gage meets or exceeds 4.9 cfs for seven (7) consecutive days.</p>
Streamflow Triggered Restrictions	<p>Nonessential outdoor water use is allowed:</p> <ul style="list-style-type: none"> a) two (2) days per week before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below: <ul style="list-style-type: none"> • May 1 – June 30: 31 cfs for three (3) consecutive days • July 1 – September 30: 13 cfs for three (3) consecutive days b) one (1) day per week before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below 4.9 cfs for three (3) consecutive days. <p>Once implemented, the restrictions shall remain in place until streamflow at the gage meets or exceeds the trigger streamflow for seven (7) consecutive days.</p>
Restrictions if Norwell has not met 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 one (1) day per week before 9 am and after 5 pm
Streamflow Triggered Restrictions	<p>Nonessential outdoor water use is allowed one (1) day per week before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below:</p> <ul style="list-style-type: none"> May 1 – June 30: 31 cfs for three (3) consecutive days July 1 – September 30: 13 cfs for three (3) consecutive days <p>Once implemented, the restrictions shall remain in place until streamflow at the gage meets or exceeds the trigger streamflow for seven (7) consecutive days.</p>

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, 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 01105730 – Indian Head River at Hanover, MA.
- Click on the gage number.
- 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.

Norwell shall 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 streamflow 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 automatic irrigation system or sprinklers;
- filling swimming pools;
- washing of vehicles, except in a commercial car wash or as necessary for operator safety; and
- washing of 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 when mandatory restrictions are in place:

- irrigation to establish a new lawn and new plantings during the months of May and September;
- irrigation of public parks and recreational fields by means of automatic sprinklers outside the hours of 9 am to 5 pm; and
- watering lawns, gardens, flowers and ornamental plants by means of a hand-held hose or drip irrigation system; and
- 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 Limits on Nonessential Outdoor Water Use Restrictions

Norwell 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 to customers shall include the following:

- A detailed description of the restrictions and penalties for violating the restrictions;
- The need to limit water use, especially nonessential outdoor water use, to ensure a sustainable drinking water supply and to protect natural resources and streamflow for aquatic life; and
- Ways individual homeowners can limit water use, especially nonessential outdoor water use.

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 Water Use Restrictions Form at <http://www.mass.gov/eea/agencies/massdep/water/watersheds/municipal-water-use-restrictions.html>

In any one year, notice to customers and MassDEP need not be provided if Permittee has already implemented water use restrictions that conform to the applicable restrictions and those restrictions are still in force.

Nothing in this permit shall prevent Norwell from implementing water use restrictions that are more stringent than those set forth in this permit. Norwell has recently adopted more stringent restrictions than those set forth above. The more stringent restrictions are outlined in Special Condition #10 (Minimization Plan).

9. Water Conservation Requirements

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

Table 6 Minimum Water Conservation Requirements	
Leak Detection	
1.	At a minimum, conduct a full leak detection survey every three years.
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.	Norwell shall have repair reports available for inspection by the Department. Norwell 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 Norwell's priority schedule including leaks up to the property line, curb stop or service meter, as applicable. Norwell shall have water use regulations in place that require property owners to expeditiously repair leaks on their property.

Metering

1. Calibrate all source and finished water meters at least annually and report date of calibration on the ASR.
2. Norwell reports its system is 100% metered. All water distribution system users shall have properly sized service lines and meters that meet AWWA calibration and accuracy performance standards as set forth in AWWA Manual M6 – Water Meters.
3. Norwell 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. The plan shall continue to include placement of sufficient funds in the annual budget to calibrate, repair, or replace meters as necessary.

Pricing

1. Norwell shall maintain a water pricing structure that includes the full cost of operating the water supply system. Norwell shall evaluate rates at a minimum every three to five years and adjust costs as needed. Full cost pricing factors all costs - operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) - into prices.
2. Norwell shall not use decreasing block rates. Decreasing block rates which charge lower prices as water use increases during the billing period are not allowed by M.G.L. c. 40, § 39L.

Residential and Public Sector Conservation

1. Norwell shall meet the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code.
2. Norwell shall meter or estimate water used by contractors using fire hydrants for pipe flushing and construction.
3. Norwell reported in 2010 in the Water Conservation Questionnaire for Public Water Suppliers that all municipally owned public buildings within the service area have water saving devices. Norwell shall continue to ensure that water savings devices are installed in all municipal buildings as they are renovated, and shall ensure water conserving fixtures and landscaping practices are incorporated into the design of new municipal capital projects.

Industrial and Commercial Water Conservation

1. Norwell shall ensure water conservation practices in all development proposals, particularly low flow devices and water-wise landscaping practices.

Public Education and Outreach

1. Norwell shall continue to implement its water conservation and education efforts designed to educate the Town's water customers on ways to conserve water. Without limitation, Norwell's 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. Upon request of the Department, the Town of Norwell 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.

10. Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins

Norwell shall minimize the impacts of its groundwater withdrawals on Subbasin 22015 by:

- Implementing seasonal limits on nonessential outdoor water use as outlined in **Special Condition 8**;
- Continued implementation of the ongoing meter replacement program and maintenance of the automatic drive-by meter reading system.

Norwell has new tier-based restrictions that are more restrictive than DEP requires in Special Condition 8 (Table 5 above). Tier 1 which is always in effect allows 2 days/week 4 hours per day (3-7AM) for a total of 8 hours per week. Table 5 allows 32 hours per week (2 days x 16 hours/day).

11. Mitigation

Norwell is required to mitigate 0.06 mgd for its renewed permitted withdrawals over baseline in the South Coastal basin. The South Coastal mitigation requirement of 0.06 mgd will be met with 6 indirect mitigation credits through land purchases in the South Coastal and Boston Harbor basins as summarized in Table 7.

Table 7
Summary of Land Purchase Mitigation Credits
Applied to South Coastal Basin Mitigation Requirement

South Costal indirect land purchase credits:	2.76
Boston Harbor indirect land purchase credits:	3.24
Total land purchase indirect mitigation credits:	6.00

A summary of the land purchases is in Appendix C.

12. Reporting Requirements

Norwell shall report annually on its ASR the raw water volumes and finished water volumes for the entire water system and the raw water volumes for individual water withdrawal points.

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 hearing request, together with a valid check, payable to the Commonwealth of Massachusetts in the amount of \$100 must be mailed to:

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

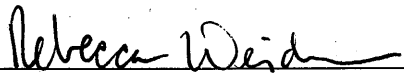
The request shall be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

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.



Rebecca Weidman, Director
Division of Watershed Management
Bureau of Water Resources

Date 2/9/18

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 2019 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, 2020, 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 DEP, 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).

Appendix C - Summary of Norwell Land Purchase Indirect Mitigation Credits

Norwell has sources, permits and developed land area in both the South Coastal and Boston Harbor basins, and the town purchased land in both basins that qualifies for indirect mitigation credit. All of the South Coastal indirect credit plus some of the Boston Harbor indirect credit will be used to meet the mitigation requirement of the South Coastal basin. The remaining Boston Harbor land purchase indirect mitigation credit may be used for the Boston Harbor mitigation requirement when that permit is renewed.

Date and Purpose of Town Meeting Approval	Major Basin	Map and Lot	Acres	Credits per acre	Credits per Lot
October 7, 2013 for watershed protection, open space, and/or recreation	South Coastal	Map 37, Lot 53	16.7	0.1	1.67
		Map 37 Lot 55	10.0	0.1	1
		Map 37, Lot 60	0.9	0.1	0.09
South Coastal Indirect Credits:					2.76
May 5, 2014 for watershed protection, open space, and/or recreation	Boston Harbor	Map 13, Lot 13	4.0	0.1	0.4
May 2, 2016 for improving the drinking water supply		Map 1, Lot 2	25.8	0.1	2.58
		Map 14, Lot 2	5.1	0.1	0.51
		Map 14, Lot 3	5.1	0.1	0.51
		Map 14, Lot 14	15.2	0.1	1.52
		Map 14, Lot 17	7.6	0.1	0.76
		Map 14, Lot 18	4.0	0.1	0.40
		Map 14, Lot 17*	2.4	0.2	0.48
		Map 14, Lot 18*	3.7	0.2	0.74
Boston Harbor Indirect Credits:					7.9
Total Acres:			100.5	TOTAL CREDITS:	10.66

* Lots 17 and 18 on Map 14 are 10 acres and 7.7 acres, respectively. A portion of each parcel is designated as "Core Habitat of Species of Conservation Concern" per the Massachusetts Natural Heritage & Endangered Species Program and therefore qualifies for 0.2 indirect mitigation credits per acre.

