MassDEP
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
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Lieutenant Governor

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Secretary

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February 14, 2020

Mr. Joseph LaPointe
Superintendent
Abington-Rockland Joint Water Works
366 Centre Street
Rockland, MA 02370

RE: Abington-Rockland Joint Water Works
PWS ID #4001000
Water Management Act Permit #9P2-4-21-251.01

Dear Mr. LaPointe:

Attached please find:

- Findings of Fact in support of the Permit #9P2-4-21-251.01, and
- WMA Permit #9P2-4-21-251.01 for the Abington-Rockland Joint Water Works.

If you have any questions regarding this information, please contact Beth McCann at (617) 292-5901 or via e-mail at elizabeth.mccann@mass.gov.

Very truly yours,

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

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Ecc: Duane LeVangie, MassDEP
Patti Kellogg, MassDEP SERO
Anne Carroll, DCR OWR
Michelle Craddock, DFW
Jen Pederson, MWWA
Julia Blatt, Mass Rivers Alliance
Blake Martin, Weston & Sampson
Tara McManus, Weston & Sampson

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/ (Version 3.30.15)

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Findings of Fact in Support of Permit Decision
Abington-Rockland Joint Water Works
Water Management Permit #9P2-4-21-251.01 in the South Coastal Basin

The Department of Environmental Protection (MassDEP) makes the following Findings of Fact in support of the attached Water Management Permit #9P2-4-21-251.01, 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 issuance of this permit is in response to a water withdrawal permit application by the Abington-Rockland Joint Water Works (ARJWW) for the purpose of public water supply.

MassDEP adopted revised Water Management Regulations at 310 CMR 36.00 on November 7, 2014, (described in greater detail below). Since that time, MassDEP 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.

ARJWW's Water Withdrawal History

Registered Sources: ARJWW holds two Water Management registrations:

- Registration 4-21-251.01 is for an average annual daily withdrawal of 2.21 million gallons per day (MGD) from the Hingham Street Reservoir and Great Sandy Bottom Pond in the South Coastal Basin; and
- Registration 4-25-251.01 is for an average annual daily withdrawal of 0.46 MGD from the Myers Avenue Wells #1-4 in the Taunton River Basin.

Permit Application: On August 29, 1991, ARJWW filed a Water Management Permit application for the planned expansion of the Hingham Street Reservoir and increased town-wide water use through 2010. On November 20, 1991, MassDEP issued an Order to Complete requesting firm yield analyses of the Hingham Street and the Great Sandy Bottom Pond Reservoirs to be approved by MassDEP prior to issuance of a permit.

Great Sandy Bottom Pond is considered to be a groundwater driven reservoir. During the early 1990's, MassDEP had not developed an acceptable methodology for determining the firm-yield of groundwater driven reservoirs. On November 3, 1995, MassDEP extended the completion deadline for the ARJWW permit application pending MassDEP's development of a method for determining the firm yield of groundwater driven reservoirs for Water Management permitting.

In 2004, the U.S. Geological Survey completed a groundwater model for Great Sandy Bottom Pond, *Simulated Ground-Water Flow for a Pond-Dominated Aquifer System near Great Sandy Bottom Pond, Pembroke, Massachusetts* (USGS Scientific Investigations Report 2004-5269). This study is not a firm yield analysis for the reservoir, but did provide a groundwater model that can be used to accurately predict the firm yield for Great Sandy Bottom Pond. Subsequently, MassDEP and ARJWW's consultant, Weston & Sampson, developed a mutually agreeable approach for assessing the Great Sand Bottom Pond firm yield using the groundwater model.

Prior to issuance of a final permit, ARJWW filed a new Water Management 20-year permit application on June 29, 2012, for projected withdrawals through 2030. On September 13, 2012, MassDEP sent ARJWW an Order to Complete requesting supplemental information needed to review the 2012 application. ARJWW provided all requested information including:

- A November 2012 firm yield analysis for the Hingham Street Reservoir;
- An October 2012 firm yield analysis for Great Sandy Bottom Pond;
- A February 2013 Source Water Protection Plan;
- A December 12, 2012, Best Effort letter from ARJWW to the Town of Pembroke requesting that Pembroke adopt zoning and non-zoning protection controls for the reservoir Zone A's;
- Leak detection reports for Abington and Rockland for 2010 through 2012;
- Abington's and Rockland's Water Restriction By-Laws, with March 5, 2014, correspondence noting that the restrictions are mandatory in Abington, but voluntary in Rockland; and
- A March 5, 2014, letter responding to questions received through public comment.

A permit was not issued at that time because all other Water Management permits in the South Coastal Basin were awaiting their 20-year renewal, but had been extended by four years until 2015 by the Permit Extension Act[1]. ARJWW's application was extended to allow MassDEP to review all South Coastal Basin permit applications and renewals, and any potential environmental impacts from proposed withdrawals, as a group in 2015 at the end of the 4-year extension.

On February 18, 2015, MassDEP issued a supplemental Order to Complete to ARJWW requesting information needed to develop permit conditions consistent with the November 7, 2014, amendments to the Water Management Program regulations (310 CMR 36.00), which are described in greater detail below.

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

The Water Management Act (Act) requires MassDEP to issue permits that balance 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;

[1] Chapter 240 0f the Acts of 2010, as amended by Chapter 238 of the Acts of 2012, collectively known as the Permit Extension Act.

- 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 Water Resources Commission (WRC). The regulations reflect a carefully developed balance to protect the health of Massachusetts' water bodies while meeting the public's need 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 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 2018 (https://www.mass.gov/files/documents/2018/09/11/ma-water-conservation-standards-2018.pdf), including;
    - 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;
    - protection for coldwater fish resources;
    - minimization of withdrawal impacts in areas stressed by groundwater withdrawals;
    - 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 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 for the South Coastal Basin is 70.1 MGD, and total registered and permitted withdrawals are 44.56 MGD (not including the additional 0.59 MGD proposed for this permit). The maximum withdrawals that will be authorized in this and all other permits currently under review by MassDEP 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 ARJWW 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 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, authorizes the maximum (registered plus permitted) average daily and total annual withdrawal volumes in the South Coastal Basin based on:

a. the amount requested in ARJWW's June 2012 Water Management permit application; and
b. mitigation credit available to ARJWW at this time.

Prior to making average annual withdrawals greater than 2.77 MGD from the South Coastal Basin, ARJWW is required to develop additional mitigation activities for review and approval by MassDEP, and incorporate the additional approved mitigation into this permit through a permit amendment (BRPWM02). Average annual withdrawals of up to 2.90 MGD from the South Coastal Basin are permitted upon the addition of additional approved mitigation activities.

Special Condition 1 also identifies the maximum authorized system-wide withdrawals for ARJWW's combined withdrawals from the South Coastal and Taunton River Basins. The authorized volumes are based on water needs forecasts prepared by the Department of Conservation and Recreation (DCR) (letter of April 7, 2010) and the withdrawal request for 2025-2030 in ARJWW's June 2012 permit application. Please note that ARJWW's South Coastal Basin request for 2025-2030, combined with registered withdrawals in the Taunton Basin (2.90 + 0.46 = 3.36 MGD), is less than the DCR 65/10 forecast of up to 3.43 MGD after 2025. ARJWW may submit a new Water Management Act permit application (BRP WM03) for up to the DCR Water Needs Forecasts at any time during the term of this permit.

South Coastal Basin and System-Wide Limits (MGD)			
Permit Period	South Coastal Basin withdrawals (registered + permitted)	Maximum System-wide withdrawals	DCR 65/10 Water Needs Projections
2015-2020	2.21 + 0.52 = 2.73	3.11	3.11
NOTE: South Coastal Basin withdrawals are limited to 2.77 MGD until this permit is amended to reflect implementation of additional mitigation activities.			
2020-2025	2.21 + 0.60 = 2.81	3.19	3.19
2025-2030	2.21 + 0.69 = 2.90	3.36	3.27 + 5% buffer = 3.43

Special Condition 2, Maximum Authorized Withdrawals from each Withdrawal Point, reflects the maximum daily intake capacity of the Hingham Street Reservoir and Great Sandy Bottom Pond Reservoir, and the MassDEP-approved annual firm yield for each reservoir.

The approved firm yield for the Hingham Street Reservoir is 1.23 MGD annual average daily withdrawal based on the Hingham St. Reservoir Firm Yield Study, November 14, 2012, which determined the firm yield under drought of record conditions (1960's drought) with no downstream releases.

The approved firm yield for Great Sandy Bottom Pond is 2.0 MGD annual average daily withdrawal based on the Great Sandy Bottom Pond Safe Yield Analysis, October 2012, which determined the firm yield to be 2.0 MGD under drought of record conditions (1960's drought) with no downstream releases, or 3.0 MGD under 1-in-20-year drought conditions (1980's drought) with no downstream releases and a DEP-approved Drought Management Plan in place. MassDEP cannot approve ARJWW's Drought Management Plan (DMP), October 22, 2014, because it would likely prove inadequate during a severe drought for the following reasons:

- in order to be responsive to drought conditions **and** system demand, an approvable DMP must include demand reduction measures tied to benchmark levels within the reservoir.
    - ARJWW's DMP ties demand reduction measures to the Massachusetts Drought Task Force drought declaration process. The drought declaration process is based on drought criteria applied over a large region. The criteria may not adequately reflect specific conditions at Great Sandy Bottom Pond as a drought develops, and they do not incorporate the impact that increased water use during dry conditions will have on water levels in the reservoir.
- The DMP's outdoor water use restrictions are less stringent than the MassDEP Guidance developed during the 2016 drought as outlined below.

MA Drought Management Plan Drought Levels[2]	**Mild Drought** (formerly Advisory)	**Significant Drought** (formerly Watch)	**Critical Drought** (formerly Warning)
ARJWW DMP outdoor water use restrictions	Voluntarily limit lawn watering to before 9 am and after 7 pm	Lawn watering limited to odd/even days before 9 am and after 7 pm	- Lawn watering ban - Pool filling ban
DEP 2016 Drought Guidance on outdoor water use restrictions	Lawn watering limited to 1-day per week before 9am and after 5pm	- Lawn watering ban - Pool filling ban - Hand watering allowed before 9 am and after 5 pm	Outdoor water use ban

Should ARJWW decide to update the DMP in order to increase the approved firm yield of Great Sandy Bottom Pond, MassDEP will review an updated DMP that addresses the issues outlined above at any time. When an updated DMP is approved, ARJWW may apply for a permit amendment (BRP WM02) to increase the approved firm yield of Great Sandy Bottom Pond.

[2] The Massachusetts Drought Management Plan, September 25, 2019, (https://www.mass.gov/doc/massachusetts-drought-management-plan/download) updated the drought classifications in Massachusetts. Both the DEP 2016 Drought Guidance and the ARJWW DMP were written prior to the MA Drought Management Plan update in 2019, and so use the older nomenclature of "advisory", "watch" and "warning".

Special Condition 3, Surface Water Protection, requires ARJWW to ensure water quality protection for the Hingham Street Reservoir and Great Sandy Bottom Pond Reservoir. Department records show that ARJWW has an approved Surface Water Supply Protection Plan, but has not yet demonstrated Best Effort to ensure that the Towns of Abington, Rockland, Hingham and Pembroke have enacted surface water protection by-laws and local land use controls that meet the requirements of 310 CMR 22.20C for the portions of the Zone A for the Hingham Street Reservoir and Great Sandy Bottom Pond that lie within each town.

Within one full calendar year ARJWW must demonstrate Best Effort by submitting letters and any changes to the final text of the control measures in each Town to the MassDEP Drinking Water Program. For additional information or assistance meeting Best Effort requirements, contact Kathleen Romero of MassDEP's Drinking Water Program at Kathleen.Romero@Mass.gov or at 617-292-5727.

Special Condition 4, Water Conservation Levels for Great Sandy Bottom Pond requires ARJWW to work in conjunction with the Town of Pembroke to monitor the water level in Great Sandy Bottom Pond. In order to protect both ARJWW's ability to supply water and local environmental resources, the Town of Pembroke is required to cease withdrawals from Windswept Well #05G when water levels in Great Sandy Bottom Pond fall below the base level of 52.1 feet above mean sea level (MSL), surveyed to National Geodetic Vertical Datum (NGVD). Thereafter, Pembroke cannot resume withdrawals from the well until the level of the pond has returned to 52.1 feet above MSL.

Pembroke does not have a reliable means of monitoring the water level of Great Sandy Bottom Pond. ARJWW has a standing practice of taking regular water level measurements of the pond. Therefore:

- as a condition of its WMA Permit #9P-4-21-231.01, Pembroke is required to request from ARJWW, either electronically or by U.S. Mail, reservoir water level readings for Great Sandy Bottom Pond on the first of each month, and
- as a condition of this WMA Permit #9P2-4-21-251.01, ARJWW is required to provide monthly reservoir water level readings to Pembroke, either electronically or by U.S. Mail.

Special Condition 5, Performance Standard for Residential Gallons Per Capita Day Water (RGPCD) and **Special Condition 6, Performance Standard for Unaccounted for Water (UAW)** are part of the *Water Conservation Standards for the Commonwealth of Massachusetts* adopted by the MA Water Resources Commission in July 2018 and can be found at https://www.mass.gov/files/documents/2018/09/11/ma-water-conservation-standards-2018.pdf.

The **Residential Gallons Per Capita Day** performance standard required of all PWS permittees is 65 RGPCD. Permittees that cannot meet the performance standard within the timeframe in the permit must meet Functional Equivalence requirements outlined in Appendix A.

ARJWW's RGPCD for the last three years has been in compliance with the performance standard:

ARJWW's Residential Gallons Per Capita Day		
2018	**2017**	**2016**
56	57	58

The **Unaccounted for Water** performance standard required for all PWS permittees is 10%. ARJWW is required to meet 10% or less UAW for 2 out of every 3 years throughout the permit period. ARJWW shall be in compliance with this performance standard by December 31, 2022.

UAW is defined as the residual resulting from the total amount of water supplied to a distribution system as measured by master meters, minus the sum of all amounts of water measured by consumption meters in the distribution system, and minus confidently estimated and documented amounts used for certain necessary purposes. UAW includes unavoidable leakage, recoverable leakage, meter inaccuracies (unless they fall under the category of source meter calibration which allows for adjustment per results of source meter calibration); errors in estimation of stopped meters, unauthorized hydrant openings, illegal connections, stand pipe overflows, data processing errors; and undocumented firefighting uses. The need for water main flushing and the use of water in construction or meter calibration shall be metered or estimated as appropriate to assist in determining actual demand. Uses that can be confidently estimated and documented in writing include: storage tank overflow and drainage; water main flushing and flow testing; firefighting; bleeders or blow-offs; sewer and stormwater system flushing; and street cleaning. Any adjustments made as a result of properly documented source meter calibration shall be provided as required by the Annual Statistical Report (ASR). Any adjustment in the calculation of UAW made as a result of confidently estimated uses shall be fully documented in the ASR.

ARJWW's UAW for the most recent three years has been:

ARJWW's Unaccounted-for-Water		
2018	**2017**	**2016**
11%	11%	6%

Special Condition 7, Limits on Nonessential Outdoor Water Use reflects restrictions from May through September. Restrictions are based on whether ARJWW's reported RGPCD for the previous year was in compliance with the RGPCD Performance Standard (see Special Condition 5) and based on the permittee's preference for calendar or streamflow triggered restrictions.

Each year ARJWW 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.

  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)[3] from index gage flow data which represent the least altered stream flows in Massachusetts, and applied to the assigned local USGS stream gage.

If ARJWW selects the streamflow trigger approach, it has been assigned USGS stream gage 01105730 Indian Head River at Hanover, MA. The May - June streamflow trigger is 31 cubic feet per second (cfs), and the July – September streamflow trigger is 13 cfs. Should the reliability of flow measurement at the Indian Head River River gage be so impaired as to question its accuracy, ARJWW 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 annual 7-day low flows for the period of record. The 7-day low flow trigger is 4.9 cfs at the assigned gage.

This permit condition does not confer enforcement authority to the permittee. In order to enforce this permit condition, municipalities must also adopt a local by-law or ordinance that includes enforcement authority and establishes penalties for violations.

Special Condition 8, Water Conservation Requirements, outlines water conservation measures required of all PWS permittees based on the *Water Conservation Standards for the Commonwealth of Massachusetts* adopted by the MA Water Resources Commission in July 2018 (https://www.mass.gov/files/documents/2018/09/11/ma-water-conservation-standards-2018.pdf).

Special Condition 9, Mitigation of Impacts for Withdrawals that Exceed Baseline Withdrawals, requires mitigation for withdrawals over ARJWW's baseline withdrawal. Baseline withdrawal is the volume of water withdrawn during calendar year 2005 plus 5%, or the average annual volume withdrawn from 2003 through 2005 plus 5%, whichever is greater provided that:

a) baseline cannot be less than a permittee's registered volume;
b) baseline cannot be greater than the permittee's authorized volume for 2005; and
c) if, during the period from 2003 to 2005, the permittee's withdrawals from the water source were interrupted due to contamination of the source or construction of a treatment plant, the Department will use best available data to establish a baseline volume from the water source.

ARJWW's baseline withdrawal from the South Coastal Basin is 2.46 MGD (average withdrawals from 2003 through 2005 plus 5%). ARJWW's 2018 withdrawals from the South Coastal Basin exceeded the 2.46 MGD baseline.

ARJWW's Annual Average Withdrawals in the South Coastal Basin		
2018	**2017**	**2016**
2.55 MGD	2.43 MGD	2.42 MGD

[3] 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/

Calculating Mitigation: A Permittee's mitigation requirement is adjusted downward for the portion of the withdrawal that will be returned to local groundwater through septic systems. ARJWW reports that 3% of its water is delivered to areas with on-site septic systems and will be discharged to local groundwater. 97% is discharged to the Brockton Advanced Water Reclamation Facility or the Rockland Waste Water Treatment Facility and not returned to local groundwater. Approximately half of ARJWW's water is distributed within the South Coastal Basin, and half within the Taunton River Basin. The mitigation volume calculation below assumes that ARJWW's future withdrawals will be distributed and discharged in the same proportions. After adjusting for withdrawals over baseline that will be returned through septic system discharge (step 2 below), ARJWW's maximum mitigation requirement will be up to 431,000 gallons per day (step 3 below).

ARJWW Wastewater Adjustment Calculation for Mitigation for the South Coastal Basin
1. **Permitted amount above Baseline = 0.44 MGD** • Permitted amount above Baseline: 2.90 – 2.46 = 0.44 MGD
2. **Adjustment for Wastewater Discharge to Local Groundwater = 0.009 MGD = 9,000 gpd** • 3% of withdrawals are delivered to areas with on-site septic systems: 0.44 MGD x 0.03 (3%) = 0.0132 MGD • 85% of water delivered to areas with on-site septic systems returns to groundwater: 0.0132 MGD x 0.85 (85%) = 0.01122 MGD • The 50% delivered within the South Coastal Basin receives full credit: 0.01122 MGD x 0.50 (50%) = 0.00561 MGD = 0.006 • The 50% delivered within the Taunton River Basin receives 50% credit: 0.01122 x 0.50 (50%) x 0.50 (50%) = 0.002805 = 0.003 • Total adjustment for Wastewater discharge to local groundwater = 0.006 + 0.003 = 0.009 MGD
3. **Amount to be Mitigated after Adjustment for Wastewater Discharge to Local Groundwater = 0.431 MGD = up to 431,000 gpd** • Mitigation volume (0.44 MGD) – adjustment for wastewater discharge to local groundwater (0.009 MGD) = 0.431 MGD

ARJWW mitigation requirement is shown below in 5-year increments.

ARJWW Mitigation Requirement in 5-Year Increments		
Permit Period	**South Coastal Basin Withdrawals**	**Mitigation Requirement** (Permitted – Baseline – Adjustment for Wastewater Discharged to Local Groundwater)
2/14/2020 to 8/31/2020	2.73 MGD	0.265 MGD = 265,000 gpd
9/1/2020 to 8/31/2025	2.81 MGD	0.343 MGD = 343,000 gpd
9/1/2025 to 8/31/2030	2.90 MGD	0.431 MGD = 431,000 gpd

Summary of ARJWW Mitigation Credit	
Direct Mitigation	**Credit**
Completed Infiltration/Inflow Remediation Projects	
Town of Rockland I/I Removal	0.2212 mgd =221,200 gpd
Town of Abington I/I Removal	0.0181 mgd = 18,100 gpd
Completed Stormwater Remediation Projects	
Abington High School renovations	0.011772 mgd=11,700 gpd
Indirect Mitigation	**Credit**
Infiltration/Inflow Program Planning	
Town of Rockland I/I Program Planning and Documentation	5 credits = 0.05 mgd = 50,000 gpd
Total Mitigation Credit	**0.301 MGD = 301,000 gpd**
Maximum Additional Mitigation Credit Required	0.431 MGD – 0.301 MGD = 0.130 MGD

Direct Mitigation must be evaluated first in WMA permitting. Direct mitigation activities can be quantified volumetrically and will enhance streamflow by returning or retaining groundwater within the Basin.

- Infiltration/Inflow Remediation: The towns of Abington and Rockland have completed infiltration and inflow (I/I) projects that provide 239,300 gpd in direct mitigation. Additional direct mitigation credit may be accrued in the future as the towns complete additional I/I remediation projects. See Special Condition 9 for a summary of I/I projects and Appendix C for additional information on projects, certification of project completion and the methodology used to credit projects.
- Stormwater Remediation: The Town of Abington built a stormwater infiltration system during renovation of 6.072 acres of parking lots and playing fields at Abington High School, providing 11,700 gpd in direct mitigation. See Special Condition 9 for a summary of stormwater remediation credit, and Appendix D for the Stormwater BMP Direct Mitigation Calculator and certification of stormwater BMP completion for direct mitigation credit.

Indirect Mitigation is considered after all available direct mitigation has been evaluated. Indirect mitigation activities offset the impacts of withdrawals, but generally cannot be quantified volumetrically. Indirect mitigation activities can improve habitat, provide watershed protection, or provide water quality protection.

- Infiltration/Inflow Program Planning: Indirect mitigation credit may be given for completed plans and studies for future I/I projects. The Town of Rockland has completed I/I and Sewer System Evaluation Survey analyses equal to 4 indirect mitigation credits, and has completed the I/I Program Planning Timeline as required per 314 CMR 12.04(2) for 1 additional credit. Each indirect mitigation credit is equal to 10,000 gpd, for a total credit of 50,000 gpd. See Special Condition 9 for a summary of I/I projects and Appendix C for additional information on projects.

Prior to making average annual daily withdrawals greater than 2.77 MGD from the South Coastal Basin, ARJWW is required to implement additional mitigation activities to offset the impacts of increased withdrawals and incorporate the additional mitigation into this permit through a permit amendment (BRPWM02). Additional mitigation activities for up to 130,000 gpd are required prior to withdrawing up to the maximum volume of 2.90 mgd reserved by this permit. Water Management Program staff is

available for consultation on mitigation planning and the credit that can be accrued for specific mitigation projects.

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

Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins was incorporated into the Water Management Regulations in November 2014, and requires permittees with permitted groundwater sources in subbasins with August net groundwater depletion of 25% or more to minimize their withdrawal impacts on those subbasins to the greatest extent feasible. Minimization is not a condition of this permit because ARJWW sources in the South Coastal Basin are surface water reservoirs and as such are not required by regulation to provide minimization.

Coldwater Fish Resource (CFR) Protection was incorporated into the Water Management regulations in November 2014. ARJWW's Great Sandy Bottom Pond Reservoir is adjacent to Herring Brook which supports a coldwater fishery and a significant anadromous fish run. The Massachusetts Department of Fish and Game, Division of Fisheries and Wildlife (MassWildLife) has reviewed the potential impacts that summer drawdown in Great Sandy Bottom Pond could have on Herring Brook, and has determined that ARJWW's withdrawals will not significantly impact the CFR (email correspondence of July 10, 2019, from Todd Richards, MassWildLife, to Elizabeth McCann, MassDEP). Therefore, Coldwater Fish Resource Protection is not a condition of this permit.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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

This permit is issued pursuant to the Massachusetts Water Management Act (the Act) for the sole purpose of authorizing the withdrawal of a volume of water as stated herein 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: 9P2-4-21-251.01 **RIVER BASIN:** South Coastal

PERMITTEE: Abington-Rockland Joint Water Works
366 Centre Avenue
Rockland, MA 02370

ISSUANCE DATE: February 14, 2020

EXPIRATION DATE: August 31, 2030

NUMBER OF WITHDRAWAL POINTS Groundwater: 2 Surface Water: 0

USE: Public Water Supply

DAYS OF OPERATION: 365

LOCATION(S):

Table 1: Withdrawal Point Identification	
Reservoir Name	**PWS Source ID Code**
Great Sandy Bottom Pond	4001000-01S
Hingham St. Reservoir	4001000-02S

SPECIAL CONDITIONS

1. **Maximum Authorized Annual Average Withdrawal**
This permit authorizes the Abington-Rockland Joint Water Works (ARJWW) to withdraw water from the South Coastal Basin at the rate described below in Table 2. The permitted withdrawal rate is in addition to the 2.21 MGD previously authorized for ARJWW in WMA Registration 4-21-251.01, and the 0.46 MGD authorized in WMA Registration 4-25-251.01 in the Taunton River Basin. The permitted 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 five-year period of the permit term.

Table 2: Authorized Withdrawal Volumes in the South Coastal Basin

Permit Period	Permit*		Registration + Permit*	
	Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
2/14/2020 to 8/31/2020	0.52	189.80	2.21 + 0.52 = 2.73	996.45
9/1/2020 to 8/31/2025	0.60	219.00	2.21 + 0.60 = 2.81	1025.65
9/1/2025 to 8/31/2030	0.69	251.85	2.21 + 0.69 = 2.90	1058.50

*Prior to making average annual withdrawals greater than 2.77 MGD from the South Coastal Basin, ARJWW is required to develop additional mitigation activities for review and approval by MassDEP, and incorporate the additional approved mitigation into this permit through a permit amendment (BRPWM02) (see Special Condition 9).

In addition to the limitations outlined above in Table 2 for the South Coastal Basin withdrawals, this permit limits system-wide withdrawals from all of ARJWW's sources to the volumes shown in Table 3. ARJWW may withdraw up to the maximum shown above from its South Coastal sources, provided withdrawals from its Taunton Basin sources are adjusted so as not to exceed the system-wide volumes shown in Table 3 below.

Table 3: Maximum Authorized system-Wide Withdrawal Volumes From the South Coastal and Taunton River Basins

	Daily Average (MGD)	Total Annual (MGY)
2/14/2020 to 8/31/2020	3.11	1135.15
9/1/2020 to 8/31/2025	3.19	1164.35
9/1/2025 to 8/31/2030	3.36	1226.40

MassDEP will use the raw water withdrawal volume from all authorized withdrawal points to assess compliance with the registered and permitted withdrawal volumes.

2. **Maximum Authorized Withdrawals from Each Withdrawal Point**
Withdrawals from permitted surface water sources are not to exceed the approved annual maximum firm yield approved by MassDEP and listed in Table 4 below without advance approval from MassDEP. Calculation of the annual average daily withdrawals from each reservoir will be made based on total annual withdrawals at the end of each year and reported on the Annual Statistical Report (ASR).

Table 4: Reservoir Firm Yield, Maximum and Annual Average Daily Withdrawals Rates			
Reservoir Name	**PWS Source ID Code**	**Maximum Daily Withdrawal**	**Maximum Average Annual Daily Withdrawal**
Great Sandy Bottom Pond	4001000-01S	6.0 MGD	2.00 MGD
Hingham Street Reservoir	4001000-02S	2.20 MGD	1.23 MGD

3. **Surface Water Protection**
Department records show that ARJWW has an approved Surface Water Supply Protection Plan (February 2013) that meets the requirements at 310 CMR 22.20B and C, but has not yet demonstrated Best Effort to ensure that towns bordering the reservoirs have enacted surface water protection by-laws.

By December 31, 2020, ARJWW must demonstrate Best Effort to ensure that the Towns of Abington, Rockland, Hingham and Pembroke develop surface water protection by-laws and local land use controls that meet the requirements of 310 CMR 22.20C for the portions of the Zone A for the Hingham Street Reservoir and Great Sandy Bottom Pond that lie within each town. Best Effort letters and any changes to the final text of the control measures in each Town must be submitted to the MassDEP Drinking Water Program.

4. **Water Conservation Levels for Great Sandy Bottom Pond**
As a condition of this Water Management Permit #9P2-4-21-251.01, ARJWW is required to provide monthly reservoir water level readings for Great Sandy Bottom Pond to Pembroke, either electronically or by U.S. Mail.
Pembroke and ARJWW shall mutually agree upon the best way to convey information each month.

5. **Performance Standard for Residential Gallons Per Capita Day Water Use**
ARJWW's performance standard for residential gallons per capita day (RGPCD) is 65 gallons or less. ARJWW shall be in compliance with this performance standard by December 31, 2021 or, if ARJWW does not meet the standard, shall be in compliance with the functional equivalence requirements (Appendix A).

ARJWW shall report its RGPCD water use annually in its Annual Statistical Report (ASR).

6. **Performance Standard for Unaccounted for Water**
ARJWW's Performance Standard for Unaccounted for Water (UAW) is 10% or less of overall water withdrawal for 2 of the most recent years 3 throughout the permit period. ARJWW shall be in compliance with this performance standard by December 31, 2021. If ARJWW does not meet the standard, it shall be in compliance with 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.

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*.

ARJWW shall report its UAW percentage annually in its Annual Statistical Report (ASR). Permittees meeting the Performance Standard for Unaccounted for Water through implementation of a water loss

control program based on AWWA M36 annual water audits and guidance shall continue to report UAW annually as required in the Annual Statistical Report for public water suppliers.

7. Seasonal Limits on Nonessential Outdoor Water Use

ARJWW shall limit nonessential outdoor water use through mandatory restrictions from May 1st through September 30th as outlined in Table 5 below. 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 communities served by ARJWW have met the 65 RGPCD Standard for the preceding year RGPCD was less than or equal to 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	Nonessential outdoor water use is restricted to: a) **seven (7) days per week** before 9 a.m. and after 5 p.m.; and b) **one (1) day per week** before 9 a.m. and after 5 p.m. when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below **4.9 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 **4.9** cfs for seven (7) consecutive days.
Streamflow Triggered Restrictions	Nonessential outdoor water use is restricted to: a) **seven (7) days per week** before 9 a.m. and after 5 p.m. when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below: • 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 a.m. and after 5 p.m. when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below **4.9 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.
Restrictions if communities served by ARJWW have not met 65 RGPCD standard for the preceding year RGPCD was more than 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	Nonessential outdoor water use is restricted to: a) **two (2) days per week** before 9 a.m. and after 5 p.m.; and b) **one (1) day per week** before 9 a.m. and after 5 p.m. when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below **4.9 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 **4.9** cfs for seven (7) consecutive days.
Streamflow Triggered Restrictions	Nonessential outdoor water use is restricted to: b) **two (2) days per week** before 9 a.m. and after 5 p.m. when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below: • May 1 – June 30: **31 cfs** for three (3) consecutive days

Table 5: Seasonal Limits on Nonessential Outdoor Water Use

- July 1 – September 30: **13 cfs** for three (3) consecutive days

c) **one (1) day per week** before 9 a.m. and after 5 p.m.
when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below **4.9 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 and Drought Advisory Website Information

If the ARJWW chooses Streamflow Triggered Restrictions, ARJWW shall be responsible for tracking streamflows and drought advisories 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 quarter-hourly, reading made at each USGS stream gage.

Seasonal Nonessential Outdoor Water Use Restrictions are implemented when the mean daily streamflow falls below the designated trigger for 3 consecutive days. 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.

ARJWW 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.

Restricted Nonessential Outdoor Water Uses

Nonessential outdoor water uses that are subject to mandatory restrictions include:

- irrigation of lawns via automatic irrigation systems or sprinklers;
- filling swimming pools;
- washing 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 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 before 9 a.m. and after 5 p.m.;

- irrigation of 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 minimal fairway watering, or irrigation by plant nurseries as necessary to maintain stock).

Public Notice of Seasonal Nonessential Outdoor Water Use Restrictions

ARJWW shall notify its customers of the restrictions, including a detailed description of the restrictions and penalties for violating the restrictions, by April 15th each year.

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 website.

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

8. Water Conservation Requirements

At a minimum, ARJWW shall implement the following conservation measures. 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. 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 leak detection survey, any leaks uncovered as a result of the survey or otherwise, dates of repair and the estimated water savings as a result of the repairs.
3. Conduct field surveys for leaks and repair programs in accordance with the AWWA Manual 36.
4. Repair reports shall be kept available for inspection by MassDEP. The permittee shall establish a schedule for repairing leaks that is at least as stringent as the following: o Leaks of 3 gallons per minute or more shall be repaired within 3 months of detection. o Leaks of less than 3 gallons per minute at hydrants and appurtenances shall be repaired as soon as possible. o 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.

Table 6: Minimum Water Conservation Requirements

- Leaks shall be repaired in accordance with the permittee's priority schedule including leaks up to the property line, curb stop or service meter, as applicable.
- Permittee shall have water use regulations in place that require property owners to expeditiously repair leaks on their property.

The following exceptions may be considered:

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

*Reference: MWRA regulations 360 CMR 12.09
**Mass Highway or local regulations may regulate the timing of tearing up pavement to repair leaks.

Metering

1. Calibrate all source, treatment, and finished water meters at least annually and report date of calibration on the ASR.
2. One hundred percent (100%) metering of the system is required. 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. The permittee shall have an ongoing program to inspect individual service meters to ensure that all service meters accurately measure the volume of water used by its customers. The metering program shall include regular meter maintenance, including testing, calibration, repair, replacement and checks for tampering and sealing meters where possible, to identify and correct illegal connections.
4. Ensure sufficient funds in the annual budget to calibrate, repair, or replace meters as necessary.

Pricing

1. Establish a water pricing structure that includes the full cost of operating the water supply system. Full cost pricing recovers all costs as applicable, including:
   - pumping and distribution equipment cost, repair and maintenance;
   - water treatment;
   - electricity;
   - capital investment, including planning, design and construction;
   - land purchase and protection;
   - debt service;
   - administrative costs including systems management, billing, accounting, customer service, service studies, rate analyses and long-range planning;
   - conservation program including audits, leak detection equipment, service and repair, meter replacement program, automated meter reading installation and maintenance, conservation devices, rebate program, public education program;
   - regulatory compliance; and
   - staff salaries, benefits training and professional development. .
2. Evaluate rates at a minimum every three to five years and adjust costs as needed.
3. Permittee shall not use decreasing block rates. Decreasing block rates which charge lower prices as water use increases during the billing period, are prohibited by M.G.L. Chapter 40 Section 39L.
4. Implement quarterly or more frequent meter reading and billing.

Table 6: Minimum Water Conservation Requirements
Residential and Public Sector Conservation
1. Permittee shall meet the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code.
2. Meter or estimate water used by contractors using fire hydrants for pipe flushing and construction.
3. By December 31, 2020, submit to MassDEP a status report detailing which municipally owned public buildings in the permittee's service area have been retrofitted with water saving devices (faucet aerators, low flow shower heads and low flow toilets) and which of those buildings have yet to be retrofitted. On or before December 31, 2021, ensure that all municipally owned public buildings in the service area are retrofitted, or for Water Districts and Water Companies, demonstrate to MassDEP's satisfaction that a "Best Effort" was made by the permittee to get the Town to make those retrofits. Note municipally owned public buildings scheduled for rehab or demolition after the deadline for completing the retrofits, may with MassDEP's approval, be exempted from this condition based on the schedule of work. Status report required above should identify those buildings and schedule for repairs/demolition.
Industrial and Commercial Water Conservation
1. Permittee reports that 85% of all water distributed is for residential use, 13% of all water distributed is for commercial use, and the permittee has no industrial water users. Permittee shall ensure water conservation practices, including the installation of WaterSense compliant low flow plumbing fixtures where applicable, and low water use landscaping, in all development proposals.
Lawn and Landscape
1. Develop and adopt or update as necessary, a water use restriction bylaw, ordinance or regulation that authorizes enforcement of the seasonal limits on nonessential outdoor water use required by this permit. MassDEP has developed the "DEP Model Outdoor Water Use Bylaw/Ordinance" to help municipalities and water districts implement seasonal water conservation requirements. The Model Bylaw also includes options for regulating private wells and in-ground irrigation systems. See http://www.mass.gov/eea/agencies/massdep/water/regulations/model-water-use-restriction-bylaw-ordinance.html
Public Education and Outreach
1. Develop and implement an education plan, including elements in the following list, as applicable: o Billing that helps customers track, compare, and make sense of their use. o Target outreach to customers who may have a leak or who are using significantly more water than similar customers. o Offer indoor low-flow retrofit/rebate programs. o Provide information on "water-wise landscaping" and efficient irrigation and lawn care practices on-line and through model landscapes, workshops, local garden clubs, retailers, and environmental organizations. o Partner with local schools to develop age-appropriate curricula on the local water system and water conservation. o Use social media, online tools, public service announcements, and local events to promote water conservation and alerts. o Develop multilingual materials as needed. o Partner with garden clubs, farmers' markets, environmental organizations, energy utilities, and others on campaigns promoting wise water use.
2. Upon request of MassDEP, permittee shall report on its public education and outreach efforts, including a summary of activities developed for specific target audiences, any events or activities sponsored to promote water conservation and copies of written materials.

9. Mitigation of Impacts for Withdrawals that Exceed Baseline

This permit reserves up to 2.90 mgd from the South Coastal Basin for ARJWW's withdrawals through 2030. ARJWW is required to mitigate up to 0.431 MGD (431,000 gpd) for its permitted withdrawals over its 2.46 MGD baseline withdrawal rate.

The mitigation requirement is met for withdrawals of up to 2.77 MGD from the South Coastal Basin (2.46 MGD baseline + 0.31 MGD additional withdrawal volume for which mitigation has been implemented) through the following direct and indirect mitigation activities.

Table 7: ARJWW Mitigation Credit	
Direct Mitigation	**Credit**
Completed Infiltration/Inflow Remediation Projects	
See Appendix C for: Infiltration/Inflow Mitigation Summary and Documentation Chart Applicant Certification for Infiltration and Inflow Removal Mitigation Credit	
Town of Rockland: post-2005 infiltration removal	0.2199 mgd = 219,900 gpd
post-2005 inflow removal	0.0013 mgd = 1,300 gpd
Town of Abington: post-2005 infiltration removal	0.0103 mgd = 10,300 gpd
post-2005 inflow removal	0.0078 mgd = 7,800 gpd
Infiltration/Inflow Subtotal	**0.2393 mgd = 239,300 gpd**
Completed Stormwater Remediation Projects	
See Appendix D for: Stormwater BMP Direct Mitigation Calculator and Applicant Certification Form	
Abington High School parking lot and playing field renovations/6.702 acres	**0.0117 mgd = 11,700 gpd**
Indirect Mitigation	**Credit**
Infiltration/Inflow Program Planning	
See Appendix C for: Infiltration/Inflow Mitigation Summary and Documentation Chart	
Town of Rockland I/I Program Planning and Documentation	**5 credits = 50,000 gpd**
Total Mitigation Credit	**0.301 MGD = 301,000 gpd**

Prior to making average annual withdrawals greater than 2.77 MGD from the South Coastal Basin, ARJWW is required to develop additional mitigation activities for review and approval by MassDEP, incorporate the additional approved mitigation into this permit through a permit amendment (BRPWM02) and implement required mitigation activities.

ARJWW shall notify MassDEP should there be any changes to the status of the mitigation projects.

10. Reporting Requirements

ARJWW 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)

No withdrawal in excess of 100,000 gallons per day over the registered volume (if any) shall be made following the expiration of this permit, unless before that date MassDEP has received a renewal permit application pursuant to and in compliance with 310 CMR 36.00.

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 water 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 36.33.

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 submitted as specified on the report form.

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

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

9. **Amendment, Suspension or Termination** MassDEP may amend, suspend or terminate the permit in accordance with M.G.L. c. 21G and 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 as described herein and in accordance with the procedures described at 310 CMR 36.37. Any such request must be made in writing, by certified mail or hand delivered and received by MassDEP within twenty-one (21) days of the date of receipt of this permit. The hearing request, including proof of payment of the filing fee, must be mailed to:

Case Administrator
MassDEP Office of Appeals and Dispute Resolution

One Winter Street
Boston, MA 02108

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

MassDEP's fee transmittal form, 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.

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

2/14/2020
Date

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

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

If the permittee fails to document compliance with the RGPCD performance standard in its 2021 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, 2021, 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 MassDEP.
3. Continued implementation will be a condition of the permit in place of meeting the 10% UAW performance standard.
4. Upon request of MassDEP, 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).

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

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

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

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

Appendix C: Infiltration/Inflow (I/I) Mitigation Summary and Documentation

Summary of I/I credits based on submitted permittee records and WMA mitigation credit guidance:

Credit (mgd)	Direct/ Indirect	Town	Inflow/ Infiltration	Activity	Data Sources	Credit Calculation Notes	Additional Notes
0.1524	Direct	Rockland	Infiltration	post-2008 infiltration removal	2008, 2010 & 2013 SSES reports	25% of all infiltration estimates in the three reports. Note that the 50% removable estimates in Table 3 of the 2010 report and Table 4 of the 2013 report were accounted for in the calculation.	Howard subbasin volumes were excluded from the 2013 SSES total due to apparent overlap with 2010 SSES
0.0009	Direct	Rockland	Inflow	ten (10) sump pump disconnections	NPDES reports; Table 4 of DEP I/I Guidelines	See attached Crediting Inflow Removal for Abington-Rockland's Sump Pump Disconnection and Manhole Repairs; 86 gpd/sump pump	
0.0004	Direct	Rockland	Inflow	manhole inflow removal (15 bowl inserts)	NPDES reports; Table 4 of DEP I/I Guidelines	See attached Crediting Inflow Removal for Abington-Rockland's Sump Pump Disconnection and Manhole Repairs; 26 gpd/ manhole	
0.0440	Direct	Rockland	Infiltration	2006-2008 manhole infiltration removal (159 chemical seals)	2008 & 2013 SSES reports	based on 25% of median manhole infiltration in Rockland's SSES reports (275 gpd/manhole)	
0.0235	Direct	Rockland	Infiltration	2006-2008 pipe infiltration removal	2008 & 2013 SSES reports	based on 25% of median pipe infiltration in Rockland's SSES reports (matched defects and repair methods); 1100 gpd for spot repairs and 5 gpd/ft for test & seal repairs	
0.0001	Direct	Abington	Inflow	one (1) sump pump disconnection	Feb 2018 Kleinfelder letter to DEP; Table 4 of DEP I/I Guidelines	See attached Crediting Inflow Removal for Abington-Rockland's Sump Pump Disconnection and Manhole Repairs;; 86 gpd/sump pump	

Appendix C: Infiltration/Inflow (I/I) Mitigation Summary and Documentation

Summary of I/I credits based on submitted permittee records and WMA mitigation credit guidance:

Credit (mgd)	Direct/ Indirect	Town	Inflow/ Infiltration	Activity	Data Sources	Credit Calculation Notes	Additional Notes
0.0077	Direct	Abington	Inflow	manhole inflow removal (295 bowl inserts)	Feb 2018 Kleinfelder letter to DEP; Table 4 of DEP I/I Guidelines	See attached Crediting Inflow Removal for Abington-Rockland's Sump Pump Disconnection and Manhole Repairs; 26 gpd/ manhole	
0.0103	Direct	Abington	Infiltration	pipe infiltration between 2013-2017	Feb 2018 Kleinfelder letter to DEP	based on 25% of the infiltration listed in Table 4 of the 2018 letter	
Subtotal of Direct Credit for I/I Projects = 0.2393 MGD (239,300 gpd) Rockland Direct Credit for I/I Projects = 0.2212 MGD (221,200 gpd) Abington Direct Credit for I/I Projects = 0.0181 MGD (18,100 gpd)							
0.05	Indirect	Rockland	N/A	I/I Program planning & documentation	Rockland I/I study, SSES, NPDES reports, and I/I program planning timeline per 314 CMR 12.04(2)	based on WMA Oct 2018 draft guidance and I/I program planning timeline per 314 CMR 12.04(2)	
Subtotal of Indirect Credit for I/I Projects = 5 credits (50,000 gpd) Rockland Indirect Credit = 5 credits (50,000 gpd)							
Total I/I Direct and Indirect Mitigation Credit = 289,300 gallons per day							

Appendix C: Infiltration/Inflow (I/I) Mitigation Summary and Documentation
Crediting Inflow Removal for Abington-Rockland's Sump Pump Disconnection and Manhole Repairs[4]

The basis for both types of inflow removal is Table 4 of DEP's *Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys* (revised May 2017). This table provides estimates of inflow from various sources (including sump pumps and manholes) resulting from a 1-year, 6-hour design storm. DEP's guidelines provide such estimates only for design storms, which are extreme events; therefore, the inflow estimates cannot be applied as annual average values per WMA mitigation crediting requirements. In order to approximate annual average inflow volumes, the WMA Program took the following steps:

a) Analyzed a long-term hourly precipitation dataset from Logan Airport (the only eastern-MA weather station with a long-term hourly dataset to our knowledge) to obtain annual average values of storm intensity, duration, and frequency. The data record (January 1894 through December 2018) was run through NetSTORM[5]. Storms were defined with a 0.1-inch depth threshold and an inter-event period of 12 hours. The results were as follows: the average storm intensity was equal to 0.047 in/hour; the average storm duration was 14.7 hours, and the average storm frequency was 59.4 events/year. Note that the median values of intensity, duration and frequency were very similar (0.046 in/hour, 14.8 hours/storm, and 59.0 storms, resp.). Also note that the annual precipitation totals at Logan were compared to those of other Boston-area meteorological stations with long term daily data, and they were found to be lower (i.e. drier), which suggests that these annual average values are conservative.

b) Compared the total accumulation of a 1-year, 6-hour storm to that of an annual average storm
   - According to the DEP I/I guidelines, a 1-year 6-hour storm accumulates 1.72 inches
   - Using the NetSTORM results, an average annual storm accumulates 0.75 inches, or 44% of the 1-year storm accumulation.

c) Given that an annual average storm accumulation is 44% of the 1-year storm, assumed that 44% of the inflow occurs
   - For sump pumps, this equates to 44% of 1200 gallons per storm, or 528 gal
   - For manhole defects, this equates to 44% of 360 gallons per storm (using the 1 gpm as an approximate Table 4 average), or 158 gal

d) Multiply the per-storm inflow times the annual average storm frequency to obtain an annual average inflow
   - Sump pump: 528 gal/storm * 59.4 storms/year = 31,363 gal/year or 86 gpd
   - Manhole: 158 gal/storm * 59.4 storms/year = 9409 gal/year or 26 gpd

MassDEP will consider requests to modify the mitigation credit whenever the permittee provides supporting evidence for it, e.g.: citing a certain number of ponding manholes (the DEP guidelines estimate roughly 3 times the inflow rate for ponding manholes than the average rate of other manhole defects).

[4] Note that some manhole defects can cause inflow while others cause infiltration. Based on the DEP I/I guidelines manholes have been categorized.

[5] Developed by Mitchell Heineman of CDM Smith, NetSTORM is a software program for analyzing precipitation data and simulating urban runoff. The latest version was released in March 2018; download available at http://www.dynsystem.com/netstorm/ . Mr. Heineman provided DEP with the precipitation data and model results.

Appendix C: Infiltration/Inflow (I/I) Mitigation Summary and Documentation

MassDEP Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys
Table 4: Suggested Guide for Flow [1]

Inflow Sources	Average Inflow Rate (gpm)[2]	Design Storm Total Volume(gal)[3]
Manhole Defects		
Ponding Manhole	3.0[4]	1000[5]
Pick or Vent Hole (Per hole)		
Diameter		
½"	1.2[6]	432[7]
¾"	2.7[6]	1000[7]
1"	4.8[6]	1730[7]
1 ¼"	7.5[6]	2700[7]
Rim Seal	1.0-5.0	
Corbel Lead or Cracked Frame Seal	0.5-1.5	
Broken Frame	1.0-2.0	
Main Sewer Defects		
Cross Connections	5-25	
Private Sector Sources		
Storm Sump Pump to Sanitary Sewer	3.0-6.0	1200
Foundation Drain or Floor Drain	3.0-6.0	
Downspout	3.0[4]	1000[5]
Driveway Drain	3.0[4]	1000[5]
Window Well or Stairway Drain	0.5-1.0	

NOTES:

1. Individual sources may be assigned different rates based on site conditions, and best engineering judgment.
2. Based on Average rainfall intensity of 0.29 in/hr (Design Storm). Peak flow rate may be also considered based on peak rainfall intensity of 0.87 in/hr.
3. Based on total rainfall of 1.72 in. (Design Storm).
4. Flow is calculated by using the rational formula assuming the following: Q = CiA

   Area of discharge = A (Acres)
   Coefficientof discharge = C
   Average rainfall intensity = i in/hr

   This yields Q in CF/sec. Q is then converted to gpd.

   For accurate calculation area of discharge must be measured in the field and coefficient of discharge will vary according to the type of soil/pavement.
5. Estimated volume of inflow is based on the same parameters of the flow rate except the intensity used is the total rainfall of the design storm, which is 1.72" (in).
6. Flow rate is per hole and assuming 2" (in) head of rainfall accumulation.
7. Estimated volume of inflow is based on a duration of 6 hours of rainfall.

Abington-Rockland Joint Waterworks (Abington)
#9P2-4-21-251.01
Appendix C

Applicant Certification for Infiltration and Inflow Removal Mitigation Credit

I hereby certify that:

1. I have compiled, evaluated and/or established all pertinent documents, instruments, records and information necessary to provide this certification, including the documents listed as attachments to this certification.
2. I have consulted with legal, technical and other qualified professionals, as necessary for me to make this certification, including Weston & Sampson Engineers, Inc..
3. The following is true:
    a. Weston & Sampson has reviewed all the documents that have been submitted to MassDEP in support of the infiltration and inflow removal mitigation credit.
    b. The Town of Abington is in compliance with the requirements of 314 CMR 12.04(2) to develop and implement a MassDEP-approved plan to control infiltration and inflow to its sewer system ("I/I Plan").
    c. The Town of Abington has a funding mechanism in place for the full implementation of its I/I Plan throughout the life of WMA Permit #9P2421251.01 (the "Permit").
    d. All removal work for which mitigation credit is sought occurred in or after 2005.
    e. All removal work for which mitigation credit is sought has been or will be conducted in accordance with MassDEP's *Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Surveys*, May 2017 ("DEP's *Guidelines*").
    f. All removal work for which mitigation credit is sought utilizes removal methods that are reasonable based on the professional judgment of *MassDEP's regional wastewater staff*. Any estimates for which the estimation method and/or removal method is unknown or does not follow DEP's *Guidelines* have been clearly identified in the attached documents.
    g. All removal work for which mitigation credit is sought is or will be adequately operated and maintained after construction is completed.
4. I shall maintain a copy of all records, regardless of form (*e.g.*, both printed and electronic) upon which I rely in making this certification until a final decision on this application has been issued by the Department and, if this application is approved, will do so thereafter in accordance with the permit conditions. Such records shall include without limitation all documents described in paragraph 1, above, and any supporting documents provided to me by, or relied upon by, such qualified professionals as I may consult in certifying as to the information set forth in paragraph 2, above.
5. I attest under the pains and penalties of perjury that the information contained in this certification and its attachments is, to the best of my knowledge and belief, true, accurate and complete. I am authorized to make this attestation on behalf of the permit applicant. I am aware that there are significant penalties for submitting false, inaccurate or incomplete information, including, but not limited to, the possibility of fine and imprisonment for knowing violations.
6. I am aware that submitting a false and misleading certification could lead to modification, suspension or revocation of any permit granted pursuant to this certification, as set forth in 310 CMR 36.29 and 36.43.

Attachments:

A. I/I Removal Summary Table (Town of Abington work only)

Signature of Applicant: John F. Stone Date: 10/26/19

Printed Name of Applicant: John F. Stone, Director, Abington Department of Public Works

Appendix D: Stormwater BMP Project Description and Mitigation Calculator

The Town of Abington built an extensive stormwater infiltration system during renovation of parking lots and playing fields at the Abington High School. The amount of recharge is calculated using the MassDEP calculator below. The project resulted in approximately 6.1 acres of hardscape (mostly pavement) being linked to recharge facilities to promote infiltration of stormwater through catchment and leaching facilities. These facilities channel stormwater into soils that are effective in infiltrating runoff from the impervious surfaces. In addition, the town of Abington owns and is responsible for the facilities. The Town Public Works Department maintains these facilities. Typical maintenance includes clearing of inlets, removal of sediment and other debris from infiltration facilities. Stormwater facilities are subject to inspections before and after major storm events and at the end of the winter season.

STORMWATER BMP DIRECT MITIGATION CALCULATOR						
Only green cells can be edited. Gray cells are automatically populated or calculated.						
ENTER the name of the WMA permit holder:	Abington-Rockland Joint Water Works Permit 9P2-4-21-251.01 Post 2005 Projects					
STEP 1: ENTER Recharging BMP Name or Other Identifier	**ABINGTON Annual Precipitation (inches)**	**STEP 3: ENTER the design infiltration depth (inches of runoff per 24-hour storm) the BMP infiltrates in 72 hours.**	**STEP 4: ENTER the acres of pre-2005 directly connected impervious surface connected to an infiltration BMP since January 1, 2005.**	**Percent of Annual Precipitation Infiltrated**	**Infiltration Credit (cubic feet/year)**	**Infiltration Credit (MGD)**
Abington High School Project No. 13013.00 3/10/2015	[illegible]	0.6	6.1	[illegible]	[illegible]	[illegible]
TOTAL CREDIT (MGD)						[illegible]

Abington-Rockland Joint Waterworks
9P2-4-21-251.01
Appendix D

Applicant Certification for Stormwater BMP Direct Mitigation Credit

I hereby certify that:

1. I have compiled, evaluated and/or established all pertinent documents, instruments, records and information necessary to provide this certification, including without limitation, the **Stormwater BMP Direct Mitigation Calculator** Excel workbook provided by MassDEP to calculate the volumetric mitigation credit for each stormwater infiltration Best Management Practice (BMP) for which credit is sought, using the following data:

   Provided by applicant:
   a) Area of existing directly connected impervious surface[1] re-directed to the BMP;
   b) Infiltration BMP's design infiltration depth (maximum inches of runoff per 24-hour storm infiltrated in 72 hours)

   Provided by DEP in **Stormwater BMP Direct Mitigation Credit Calculator** Excel form:
   c) Percent of annual precipitation infiltrated, based on the BMP design infiltration depth;
   d) Annual average precipitation for the town or city where the project is located.

2. I have consulted with legal, technical and other qualified professionals, as necessary for me to make this certification.

3. The following is true:
   a. All stormwater infiltration BMPs for which mitigation credit is sought were built on or after January 1, 2005 and receive runoff from directly connected impervious surface[1] constructed prior to 2005. All stormwater BMPs for which mitigation credit is sought have been designed and built in accordance with the Massachusetts Stormwater Handbook, whether inside or outside of a wetlands resource area;
   b. All stormwater for which volumetric credit is claimed is recharged to groundwater;
   c. The entire stormwater system for projects that include BMPs for which direct mitigation credit is sought conforms to the Massachusetts Stormwater Handbook, including an operation and maintenance plan.
   d. For stormwater projects located in wetlands or within MS4 jurisdictional areas that include BMPs for which credit is sought, the appropriate municipal authority has reviewed and approved the stormwater plans and specifications, including operation and maintenance plans.

4. I shall maintain a copy of all records, regardless of form (e.g., both printed and electronic) upon which I rely in making this certification until a final decision on this application has been issued by the Department and, if this application is approved, will do so thereafter in accordance with the permit conditions. Such records shall include without limitation all documents described in paragraph 1, above, and any supporting documents provided to me by, or relied upon by, such

[1] Directly connected impervious surfaces are those whose runoff discharges to a surface water body.

qualified professionals as I may consult in certifying as to the information set forth in paragraph 2, above.

5. I attest under the pains and penalties of perjury that the information contained in this certification and its attachments is, to the best of my knowledge and belief, true, accurate and complete. I am authorized to make this attestation on behalf of the permit applicant. I am aware that there are significant penalties for submitting false, inaccurate or incomplete information, including, but not limited to, the possibility of fine and imprisonment for knowing violations.

6. I am aware that submitting a false and misleading certification could lead to modification, suspension or revocation of any permit granted pursuant to this certification, as set forth in 310 CMR 36.29 and 36.43.

Attachments:

A. Stormwater BMP Direct Mitigation Credit Calculator Excel spreadsheet – Abington High School

Signature of Applicant: _____ Date: 10/26/19

Printed Name of Applicant: John F. Stone, Director, Abington Department of Public Works