



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

July 22, 2016

Matthew Sawicki  
North Sagamore Water District  
14 Squanto Road P.O. Box 133  
Sagamore Beach, MA 02562

RE: North Sagamore  
PWS Number: 4036002  
WMA Permit #9P3-4-21-036.01  
Program: Water Management Act  
Action: Permit Renewal

Dear Mr. Sawicki:

Please find the attached documents:

- Findings of Fact in Support of the renewal of Permit #9P3-4-21-036.01; and
- FINAL Water Management Act Permit #9P3-4-21-036.01 (South Coastal Basin) for the North Sagamore Water District.

If you have any questions regarding this information, please contact Shi Chen at (617) 292-5532 or via e-mail at [shi.chen@state.ma.us](mailto:shi.chen@state.ma.us).

Very truly yours,

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

Y:\DWPWMA\PermitRenewals\South Coastal\North Sagamore-FINAL Permit 9P342103601-2016-07-22

Y:\DWP Archive\SERO\2016\Bourne-Final WMA Permit 9P342103601-2016-07-22

Ecc: Jen Pederson, MWWA

Michelle Craddock, DFW

Samantha Woods, North and South Rivers Watershed Association

Julia Blatt, Executive Director, Massachusetts Rivers Alliance, 14 Beacon Street, Suite 607,  
Boston, MA 02108



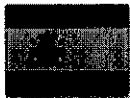
**Massachusetts Department of Environmental Protection**  
**One Winter Street, Boston MA 02108 • Phone: 617-292-5751**

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



**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.



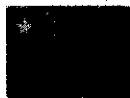
**2 Español (Spanish):**

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):**

Este documento é importante e deve ser traduzida imediatamente. Se você precisa deste documento traduzido, por favor, entre em contato com Diretor de Diversidade da MassDEP para os números de telefone listados abaixo.



**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)):**

本文件非常重要，应立即翻译。如果您需要翻译这份文件，请用下面列出的电话号码与 MassDEP 的多样性总监联系。



**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 ឯកសារនេះសូមទំនាក់ទំនងឆ្នោតជានាយក MassDEP នៅលេខទូរស័ព្ទដែលបានរាយនាងក្រោម។



**8 Kriolu Kabuverdianu (Cape Verdean):**

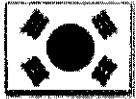
*Es documento é importante e deve ser traduzido imidiatamente. Se bo precisa des documento traduzido, por favor contacta Director de Diversidade na MassDEP's pa es numero indicode li d'boche.*

**9 Русский язык (Russian):**

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.

**11 한국어 (Korean):**

이 문서는 중요하고 즉시 번역해야 합니다. 당신이 번역이 문서가 필요하다면 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 ստորև.

**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.

**14 Français (French):**

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

**15 Deutsch (German):**

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Wenn Sie dieses Dokument übersetzt benötigen, wenden Sie sich bitte Diversity Director MassDEP die in den unten aufgeführten Telefonnummern.

**16 Ελληνική (Greek):**

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.

**17 Italiano (Italian):**

Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, si prega di contattare la diversità Direttore di MassDEP ai numeri di telefono elencati di seguito.

**18 Język Polski (Polish):**

Dokument ten jest ważny i powinien być natychmiast przetłumaczone. Jeśli potrzebujesz tego dokumentu tłumaczone, prosimy o kontakt z Dyrektorem MassDEP w różnorodności na 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.



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### **Findings of Fact in Support of FINAL Water Management Permit # 9P3-4-21-036.01 North Sagamore Water District**

The Department of Environmental Protection (the Department) makes the following Findings of Fact in support of the attached Final Water Management Permit #9P3-4-21-036.01, 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 by the North Sagamore Water District 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 on February 29, 2016 with North Sagamore's representatives regarding the conditions in this permit and, in particular, the inability to prepare a new water needs forecast for inclusion in the renewed permit and the performance standard for the Residential Gallons per Capita Day (RGPCD). As a result, the Department has provided North Sagamore three years to collect additional withdrawal data for review in developing a water needs forecast by the Department of Conservation and Recreation (DCR).

#### **North Sagamore Water District's Withdrawal History**

North Sagamore holds a registration statement (4-21-036.03) for an average annual daily withdrawal volume of 0.18 million gallons per day (MGD) from two wells in the South Coastal Basin. North Sagamore was first issued a Water Management Act permit in January 11, 1992 to increase the total authorized withdrawal volume and to add the Black Pond Well (4036002-03G) as a withdrawal point. The permit was amended in December 1997 and January 2000 to increase the total authorized withdrawal volume and to add the Beach Well (4036002-01G) and the Church Lane Well (4036002-04G). North Sagamore has reported annual withdrawals below their authorized volume of 0.53 mgd for the past 5 years. The average daily withdrawal volume for the North Sagamore Water District in 2015 was 0.42 MGD. No increase in authorized withdrawal volumes is authorized by this Renewed Permit Decision.

#### **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. North Sagamore Water District 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.

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 North Sagamore 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), North Sagamore Water District's 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;
- 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 47.4 MGD, leaving 22.7 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 North Sagamore'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 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 Volume**, reflects the authorized withdrawal volumes based on recommendations made by the Department of Conservation and Recreation's Office of Water Resources (OWR). OWR recommends a temporary allocation of water for the North Sagamore Water District at this time because the data available in the Annual Statistical Reports filed are not sufficiently accurate to calculate a water needs forecast. MassDEP hereby issue a total authorized withdrawal of 0.53 MGD through August, 31, 2020. The volumes allocated in this renewed permit are the maximum authorized in your expiring permit. The authorized volumes are interim allocations for your system and are temporary pending the preparation of a water needs forecast for North Sagamore and the modification of your permit. Should volumes greater than those authorized in this permit be necessary North Sagamore will need to apply for a new permit.

**Special Condition 2, Maximum Authorized Daily Withdrawals Points**, reflects the MassDEP-approved Zone II maximum daily pumping rate for each of North Sagamore'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 Delineations**, all of North Sagamore Water District's permitted sources have approved Zone II's delineated. No further Zone II work is required as a condition of this renewed 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, Performance Standard for Residential Gallons Per Capita Day Water Use**, for all PWS permittees is 65 gallons, except for PWS with large seasonal population fluctuations where residential per capita water use cannot be reliably calculated as determined by the Department in consultation with the Department of Conservation and Recreation (DCR). North Sagamore shall be in compliance with this performance standard by December 31, 2019 through this permit. North Sagamore Water District, which received an interim allocation from DCR because of insufficient data, shall develop the data necessary for DCR to prepare a Water Needs Forecast (WNF) over the next three years. The District shall also gather data on their seasonal population swings to determine the reliability of their RGPCD calculations. This data and the appropriateness of applying the 65 RGPCD standard will be reviewed by the Department at the time DCR is developing the WNF for the District. If the Department determines that the RGPCD performance standard is not appropriate for the North Sagamore Water District, the Department will modify this permit to remove the 65 RGPCD requirement. If the 65 RGPCD performance standard is deemed appropriate and North Sagamore does not meet the 65 RGPCD by December 31, 2019, North Sagamore will be required to begin implementing the RGPCD compliance plan outlined in Appendix A in 2020.

**Special Condition 6, 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. As accepted by the Department, North Sagamore's UAW for the most recent three years has been:

2015	2014	2013
4.4%	6%	12.4%

**Special Condition 7, Seasonal Limits on Nonessential Outdoor Water Use**, requires North Sagamore Water District to implement nonessential outdoor water use restrictions from May 1 to September 30, beginning in 2017. North Sagamore can choose to implement the restrictions based on the calendar (all summer). It can also implement the restrictions only when groundwater levels in a U.S. Geological Survey (USGS) monitoring well fall below certain defined levels for at least 60 consecutive days and when a drought advisory is declared for the region.

If North Sagamore selects the USGS monitoring well approach, it has been assigned the USGS monitoring well 415453070434901 (MA-PWW 22) at Plymouth, MA.

If North Sagamore would like to propose an alternative nonessential restriction program in the future for inclusion in the permit, the alternative nonessential restriction program should be as stringent as the USGS

monitoring well approach. MassDEP will review the alternative nonessential restriction program and include it in the permit through permit amendments, if applicable.

**Special Condition 8, Water Conservation Requirements**, incorporates the Water Conservation Standards for the Commonwealth of Massachusetts reviewed and approved by the Water Resources Commission in July 2006 and revised in June 2012 (<http://www.mass.gov/eea/docs/eea/wrc/water-conservation-standards-rev-june-2012.pdf>). No industrial and commercial water conservation work is required for North Sagamore in this permit as there are less than 5% commercial accounts in its service area.

**Special Condition 9, Reporting Requirements**, ensures that the information necessary to evaluate compliance with the conditions included herein is accurately reported.

**Mitigation of Impacts for Withdrawals that Exceed Baseline Withdrawals** requires mitigation of the impacts of withdrawals above the permittee's baseline, which is based on withdrawals made during 2003-2005. The calculated baseline withdrawal volume for North Sagamore is 0.53 MGD, the average withdrawal volume from 2003 to 2005 plus 5%. Mitigation is not required at this time because volumes greater than the baseline are not allocated by this permit. Should North Sagamore needs more than 0.53 MGD they will need a new permit and mitigation will be required if feasible.

**Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins**, requires permittees with permitted groundwater sources in subbasins<sup>1</sup> with net groundwater depletion of 25% or more during August to minimize their withdrawal impacts on those subbasins to the greatest extent feasible.

Since North Sagamore's permitted sources are located in the Plymouth-Carver Aquifer where August net depletion has not been established, they are not currently required to implement measures to minimize the withdrawal impact.

**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 North Sagamore's withdrawals do not impact any waters that MA Division of Fisheries and Wildlife has identified as supporting coldwater fish at this time.

#### **Revisions made to the Draft Permit**

Because the North Sagamore Water District supplies water to customers located in Bourne and Sandwich which are identified as part of the Cape Cod Region by the State Drought Management Plan, the Department has revised the nonessential outdoor water use restriction requirements outlined in Special Condition 7 to be consistent with those of other Cape permits. The revision now requires that limits on nonessential outdoor water use be triggered when the groundwater level declines to or below the designated groundwater trigger for 60 consecutive days and a drought advisory or higher is declared by the Massachusetts Drought Management Task Force for Cape Cod.

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<sup>1</sup> 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).





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### FINAL WATER WITHDRAWAL PERMIT RENEWAL

#9P342103601

#### North Sagamore Water District

This renewal of Permit #9P3421036.01 is approved pursuant to the Massachusetts Water Management Act (WMA) for the sole purpose of authorizing the withdrawal of a volume of water as stated below and subject to the following special and general conditions. This permit conveys no right in or to any property.

**PERMIT NUMBER:** 9P3-4-21-036.01

**RIVER BASIN:** South Coastal

**PERMITTEE:** North Sagamore Water District

**EFFECTIVE DATE:** July 22, 2016

**EXPIRATION DATE:** August 31, 2030

**NUMBER OF WITHDRAWAL POINTS:**

Groundwater: 3

Surface Water: 0

**USE:** Public Water Supply

**DAYS OF OPERATION:** 365

#### WITHDRAWAL POINT IDENTIFICATION

Source Name	PWS Source ID Code
Beach Well #1	4036002-01G
Black Pond Well #2	4036002-03G
Church Lane Well	4036002-04G

## SPECIAL CONDITIONS

### 1. Maximum Authorized Annual Average Withdrawal Volume

This permit authorizes North Sagamore Water District to withdraw water from the South Coastal Basin at the rate described below (Table 1). The volume reflected by this rate is in addition to the 0.18 million gallons per day previously authorized to North Sagamore under Water Management Act Registration #4-21-036.03 for withdrawal from the South Coastal Basin. The permitted volume is a temporary allocation 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) until a water needs forecast is completed for North Sagamore Water District by the Department of Conservation and Recreation's Office of Water Resources (OWR). Within three years of the date of issuance of this permit, North Sagamore must submit documentation in accordance with the Policy and Methodology for Developing Water Needs Forecasts for Public Water Suppliers and Communities, effective December 13, 2007 and revised May 1, 2009.

The Department of Environmental Protection (MassDEP) bases these withdrawal volumes on the raw water withdrawn from the authorized withdrawal points, and will use the raw water amount to assess compliance with the registered and permitted withdrawal volumes.

**Table 1: Maximum Authorized Withdrawal Volumes**

Permit Periods	Total Raw Water Withdrawal Volumes			
	Permit		Permit + Registration	
	Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
7/19/2016 to 8/31/2020	0.35	127.75	0.53	193.45
9/01/2020 to 8/31/2025	*	*	*	*
9/01/2025 to 8/31/2030	*	*	*	*

\*This permitted volume is an interim allocation and does not increase your existing allocation. North Sagamore will need to provide Annual Statistical Reports in sufficient detail to allow the Department of Conservation and Recreation (DCR) to prepare Water Needs Forecasts for North Sagamore after three consecutive years of 15% or less UAW are reported.

### 2. Maximum Authorized Daily Withdrawal Points

Withdrawals from permitted withdrawal points are not to exceed the approved maximum daily volumes listed below without specific advance written approval from MassDEP (Table 2). The authorized maximum daily volume is the approved rate of each source. In no event shall the combined withdrawals from the individual withdrawal points exceed the withdrawal volumes authorized above in Special Condition 1.

**Table 2: Maximum Daily Withdrawal Volumes**

Source Name	PWS Source Code ID	Maximum Daily Rate (MGD)
Beach Well #1	4036002-01G	0.68
Black Pond Well #2	4036002-03G	1.15
Church Lane Well	4036002-04G	1.44

**3. Zone II Delineations**

MassDEP records show that the Beach Well #1 (4036002-01G), Black Pond Well #2 (4036002-03G) and Church Lane Well (4036002-04G) each have MassDEP approved Zone II delineations. No further Zone II work is required as a condition of this permit for these sources.

**4. Wellhead Protection**

MassDEP records indicate that North Sagamore Water District has satisfied MassDEP's "Best Effort" Requirement 310 CMR 22.21(1)(d) and is currently operating in compliance with these regulations.

**5. Performance Standard for Residential Gallons Per Capita Day Water Use**

North Sagamore Water District's Performance Standard for Residential Gallons Per Capita Day (RGPCD) is 65 gallons or less. North Sagamore shall be in compliance with the Performance Standard by December 31, 2019.

North Sagamore shall report its RGPCD and the calculation used to derive that figure as part of its ASR including, without limitation, the source of the data used to establish the service population and the year in which this data was developed. See Appendix A for additional information on the requirements if the Performance Standard for RGPCD is not met.

**6. Performance Standard for Unaccounted for Water**

North Sagamore Water District's Performance Standard for Unaccounted for Water (UAW) is 10% or less of overall water withdrawal for 2 of the most recent 3 years throughout the permit period. North Sagamore shall report its UAW annually in its Annual Statistical Report (ASR) and document compliance with this Performance Standard each year. See Appendix B for additional information on requirements if the Performance Standard for UAW is not met.

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*.

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**

North Sagamore Water District shall limit nonessential outdoor water use through mandatory restrictions from May 1<sup>st</sup> through September 30<sup>th</sup> as outlined in Table 3 below. North Sagamore shall start implementing the seasonal limits on nonessential outdoor water use on May 1, 2017.

North Sagamore shall be responsible for tracking groundwater levels and drought advisories and recording and reporting when restrictions are implemented if groundwater level triggered restrictions are implemented. See Table 3 *Instructions for Accessing U.S. Geologic Survey Groundwater Level and Massachusetts Drought Advisory Website Information*.

North Sagamore shall also document compliance with the seasonal limits on nonessential outdoor water use annually in its Annual Statistical Report (ASR), and indicate whether it anticipates implementing calendar triggered restrictions or USGS monitoring well triggered restrictions during the next year.

**Restricted Nonessential Outdoor Water Uses**

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

- irrigation of lawns via sprinklers or automatic irrigation systems;
- filling swimming pools;
- washing of vehicles, except in a commercial car wash or as necessary for operator safety; and
- washing exterior building surfaces, parking lots, driveways or sidewalks, except as necessary to apply surface treatments such as paint, preservatives, stucco, pavement or cement.

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

- 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;
- irrigation of gardens, flowers and ornamental plants by means of a hand-held hose or drip irrigation systems; 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 Nonessential Outdoor Water Use Restrictions**

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

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

**Table 3: Seasonal Limits on Nonessential Outdoor Water Use**

**Permittee must at a minimum implement the following outdoor water use restrictions:**

**Groundwater level Triggered Restrictions from May 1<sup>st</sup> through September 30<sup>th</sup>**

Nonessential outdoor water use is allowed no more than TWO DAYS per week before **9 a.m. and after 5 p.m.** whenever:

- a) Groundwater levels at USGS Monitoring Well 415453070434901 (PWW 22) Plymouth, MA decline to or below the groundwater trigger for 60 consecutive days. The monthly trigger levels are listed below and are the period of record monthly 25<sup>th</sup> percentile depth to water level values, as determined and published by the USGS. Restrictions could start on May 1, so monitoring of PWW 22 begins on March 1 of each year.

**Trigger Values for Outdoor Water Use Restrictions (feet below land surface)\***

March	April	May	June	July	Aug	Sept
24.46	24.1	24.06	24	24.44	24.97	25.25

\*As of 7/13/2016

Once implemented, the restrictions shall remain in place until the daily value of the groundwater levels at the assigned USGS monitoring well have recovered to less than the trigger for 30 consecutive days (when the water table elevation has risen above the trigger level);

And

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

**Instructions for Accessing U.S. Geologic Survey Groundwater Level and Massachusetts Drought Advisory Website Information**

**Groundwater level information** is available at the USGS National Water Information System (NWIS): Web Interface. The USGS NWIS default shows Massachusetts groundwater levels in real time, i.e., the most recent, usually hourly, water level measured and recorded at each USGS monitoring well.

Seasonal Limits on Nonessential Outdoor Water Use are implemented when the daily mean depth to water level exceeds the designated trigger for 60 consecutive days (i.e., when the depth to water becomes larger than the trigger value as the water table elevation declines). The daily water level is compared to the trigger for that month. To determine if restrictions must be implemented on May 1 it is necessary to monitor the daily water level in March and April.

**Mean daily groundwater level** readings are available at the USGS NWIS Web Interface at [http://waterdata.usgs.gov/ma/nwis/current/?type=gw&group=key=county\\_cd](http://waterdata.usgs.gov/ma/nwis/current/?type=gw&group=key=county_cd)

- Scroll down to 415453070434901 MA-PWW 22, Plymouth, MA.
- Click on the station number.
- On the pull-down menu "Available data for this site" choose "Daily data".
- Under "Available Parameters" click on "WaterLevel, BelowLSD (Mean)".
- Under "Output Format" click on "Table" and enter the number of days of records (the default is 7

days; entering 60 will give you 60 days of data) and hit "GO".

- The table provides the "Daily Mean Depth to water level, feet below land surface" for the most recent number of days chosen.
- Compare each day's value to its month's trigger value (25<sup>th</sup> percentile) in your permit. Outdoor water use restrictions must be implemented when the daily depth to water level is at or below the trigger for 60 consecutive days.

## 8. Water Conservation Requirements

At a minimum, North Sagamore Water District shall implement the following conservation measures. Compliance with the water conservation requirements shall be reported to MassDEP upon request or by August 31, 2020, unless otherwise noted below.

Table 5: Minimum Water Conservation Requirements	
System Water Audits and Leak Detection	
1.	At a minimum, conduct a full leak detection survey every three years. See also Special Condition #6.
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 <i>AWWA Manual 36</i> .
4.	North Sagamore shall have repair reports available for inspection by MassDEP. North Sagamore shall establish a schedule for repairing leaks that is at least as stringent as the following: <ul style="list-style-type: none"> <li>• Leaks of 3 gallons per minute or more shall be repaired within 3 months of detection.</li> <li>• Leaks of less than 3 gallons per minute at hydrants and appurtenances shall be repaired as soon as possible.</li> <li>• 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.</li> </ul> <p>Leaks shall be repaired in accordance with North Sagamore's priority schedule including leaks up to the property line, curb stop or service meter, as applicable. North Sagamore shall have water use regulations in place that require property owners to expeditiously repair leaks on their property.</p>
Metering	
1.	Calibrate all source and finished water meters at least annually and report date of calibration on the ASR.
2.	North Sagamore Water District reports its system is 100% metered and it is replacing all the residential meters with the radio read meters. In the meanwhile, North Sagamore should keep the accuracy of the meter reading and avoid systematic data handling errors. 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 <i>AWWA Manual M6 – Water Meters</i> .
3.	North Sagamore 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 North Sagamore's annual water budget to calibrate, repair, or replace meters as necessary.

<b>Pricing</b>
<ol style="list-style-type: none"><li>1. North Sagamore Water District must continue to implement a water revenue structure that includes the full cost of operating the water supply system. North Sagamore reports evaluating its rate structure every two years and shall continue to do so. Rates should be adjusted as needed. Full cost pricing factors all costs - operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) - into the revenue structure</li><li>2. North Sagamore Water District reports using an increasing block rate structure and shall continue to do so.</li></ol>
<b>Residential and Public Sector Conservation</b>
<ol style="list-style-type: none"><li>1. North Sagamore Water District shall meet the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code.</li><li>2. North Sagamore reports metering water used by contractors using fire hydrants for pipe flushing and construction and shall continue to do so.</li><li>3. Public buildings<ul style="list-style-type: none"><li>• North Sagamore reported that all municipally buildings have been retrofitted with water saving devices.</li><li>• North Sagamore reported that it will assist the state and federal customers in its service area with water saving measures in 2015 and 2016. North Sagamore should provide an update to MassDEP on or before December 31, 2017 of its efforts on retrofitting the state and federal buildings.</li></ul></li></ol>
<b>Industrial and Commercial Water Conservation</b>
<ol style="list-style-type: none"><li>1. Not required at this time as currently there are less than 5% industrial and commercial accounts in the service area. Shall the industrial and commercial accounts increase to more than 5% in the service area, this condition will be reviewed by the Department.</li></ol>
<b>Lawn and Landscape</b>
<ol style="list-style-type: none"><li>1. North Sagamore shall update as necessary its water use restriction bylaw in accordance with the restricted nonessential outdoor water uses condition.</li></ol>
<b>Public Education and Outreach</b>
<ol style="list-style-type: none"><li>1. Continue to implement a Water Conservation Education Plan. North Sagamore Water District's Water Conservation Education Plan shall be designed to educate North Sagamore's water customers of ways to conserve water. Without limitation, North Sagamore's plan may include the following actions:<ul style="list-style-type: none"><li>• 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;</li><li>• Public space advertising/media stories on successes (and failures);</li><li>• Conservation information centers perhaps run jointly with electric or gas company;</li><li>• Speakers for community organizations;</li><li>• Public service announcements; radio/T.V./audio-visual presentations;</li><li>• Joint advertising with hardware stores to promote conservation devices;</li><li>• Use of civic and professional organization resources;</li><li>• Special events such as Conservation Fairs;</li><li>• Develop materials that are targeted to schools with media that appeals to children, including materials on water resource projects and field trips; and</li><li>• Make multilingual materials available as needed.</li></ul></li><li>2. Upon request of MassDEP, North Sagamore Water District 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.</li></ol>

## **9. Reporting Requirements**

North Sagamore shall report annually as required by completing the Annual Statistical Report (ASR) 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 the Department 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 the Department to enter and examine any property over which Permittee has authority, title or control, 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 the Department pursuant to M.G.L. c. 21G, §§ 15-17, M.G.L. c. 150, § 111, or any other enabling authority.
5. **Transfer of Permits** This permit shall not be transferred in whole or in part unless and until the Department approves such transfer in writing, pursuant to a transfer application on forms provided by the Department requesting such approval and received by the Department 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 the Department, a certified statement of the withdrawal. Such report is to be received by the Department by the date specified by the Department. 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. **Right to Amend, Suspend or Terminate** The Department 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 the Department. 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 the Department 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 the Department.

**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 the Department 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 Department'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

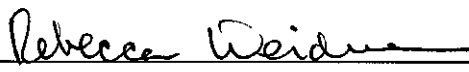
The request shall be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

**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**

The Department may waive the adjudicatory hearing filing fee for any person who demonstrates to the satisfaction of the Department 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

July 22, 2016  
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 within the time outlined in the permit, then the permittee must file with that ASR a Residential Gallons Per Capita Day Compliance Plan (RGPCD Plan) which shall include, at a minimum:

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

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

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

If a RGPCD plan is required, the permittee must:

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

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

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

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

1. Conduct an annual “top down” water audit, calculate the data validity level/score using AWWA Water Loss Control Committee’s Free Water Audit Software, and submit the AWWA WLCC Free Water Audit Software: Reporting Worksheet and data validity score annually with its Annual Statistical Report (ASR).
  - If a PWS’s data validity level/score is less than Level III (51-70), steps recommended through the audit(s) shall be taken to improve the reliability of the data prior to developing a long-term program to reduce real and apparent water losses.
  - Data with a validity score of 50 or less are considered too weak to be used to develop a component analysis or for infrastructure planning and maintenance.
  - Developing data with an acceptably strong validity score can be a multi-year process.
2. When the data validity score meets the Level III (51-70) requirement, 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).

**MassDEP UAW Water Loss Control Measures:** Permittees who do not have MassDEP approved Water Loss Control Programs in place by 6<sup>th</sup> 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.

