October 9, 2020

Massachusetts Department of Environmental Protection
Water Management Act Program
One Winter Street
Boston, MA 02108
Attn. Duane LeVangie

RE: Buzzards Bay Water District, Water Management Act Permit Application

Dear Mr. LeVangie:

The Buzzards Bay Water District (District) retained Resilient Civil Engineering, P.C. (ResilientCE) for assistance with completion of this Water Management Act (WMA) Permit application. The District has an existing WMA Permit 9P-4-24-036.01 which allows the District to withdraw an annual average day demand of 0.53 million gallons per day (mgd), through a registration amount of 0.37 mgd and a permitted amount of 0.16 mgd. The District customer base has increased over time and their current demands are just below the 0.53 mgd threshold. Therefore, the District is submitting a new WMA Permit application to receive an increase to the permitted annual withdrawal.

The following documents are attached:

- WMA Permit Application Narrative
- Water Demand Projection Approach
- WMA Permit Forms A, B, D1, D2, F and G
- Figures 1 through 7
- Water Conservation Questionnaire

I look forward to working with MassDEP and the District to complete the WMA Permit application process. If you have any questions, please contact me at 508-726-2458 or kberger@resilientce.com.

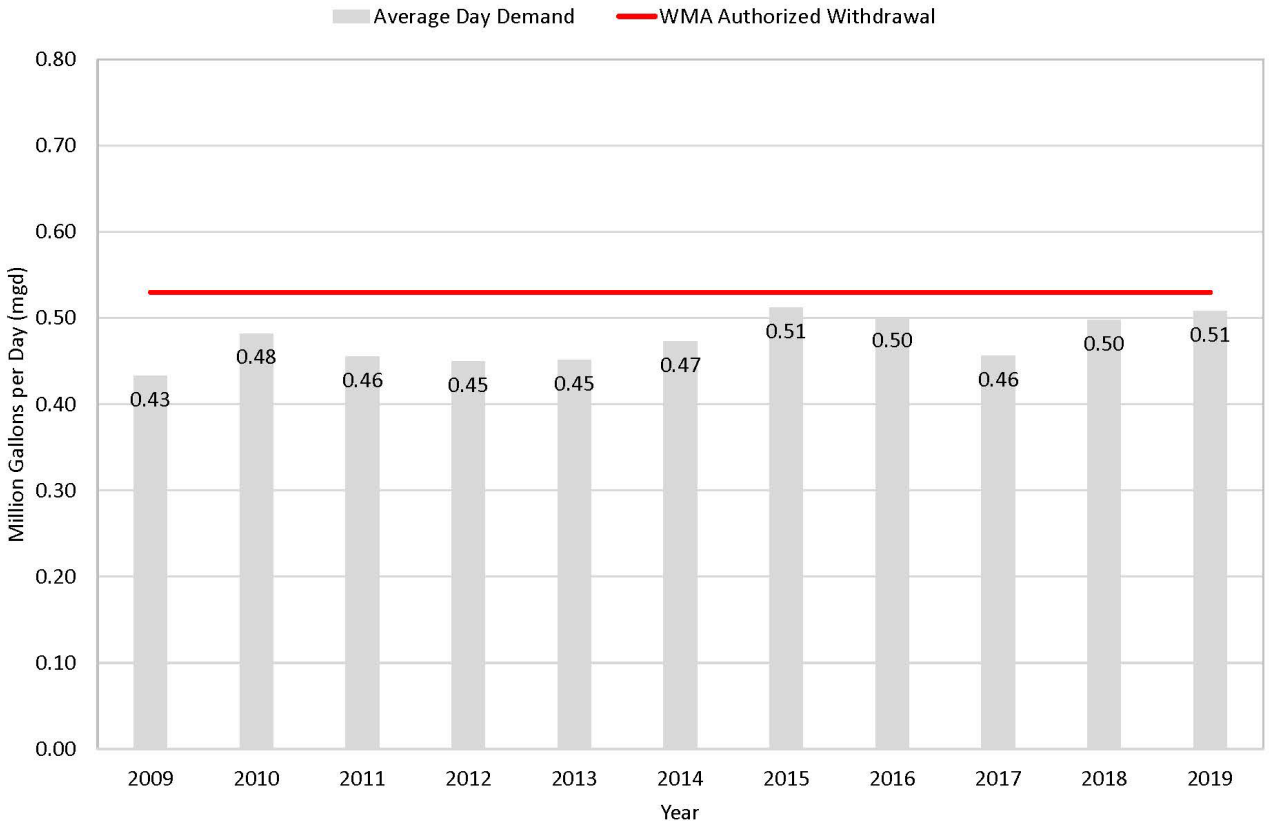
Sincerely,
Resilient Civil Engineering, P.C.

Kristen M. Berger, P.E.
President

cc. Steven Souza, Buzzards Bay Water District
Board of Selectmen, Town of Bourne

The Buzzards Bay Water District (District) seeks to increase the annual withdrawal authorized by its Water Management Act (WMA) Permit issued by the Massachusetts Department of Environmental Protection (MassDEP). The District's current WMA Permit authorizes an annual average day withdrawal of 0.53 million gallons per day (mgd), through a registration amount of 0.37 mgd and a permitted amount of 0.16 mgd. Figure 1 presents the District's annual average day demands from 2009 through 2019 (gray columns) compared with the current WMA Permit authorized withdrawal (red solid line). As shown in Figure 1 the District's annual average day demands are approaching the current permit authorized withdrawal.

Figure 1. District Annual Average Day Demand and Current WMA Permit Authorized Withdrawal

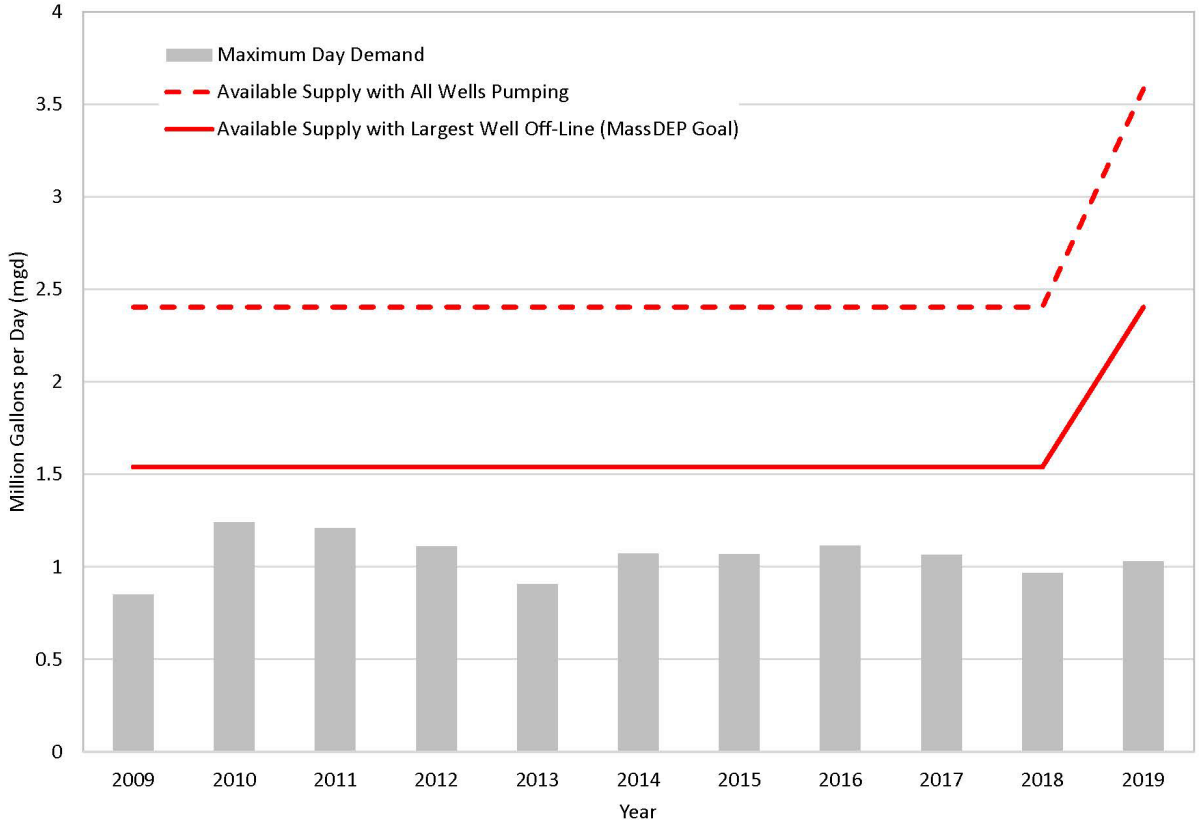


The District intends on continuing to meet its customers water demands in addition to the amount of water being requested by pending and future customers who have requested new connections, while being responsible stewards of its water supply. The District has ample water supply to meet the demands of its current customers and future customers and requires MassDEP permission to utilize that water supply.

The MassDEP Guidelines for Public Water Suppliers Chapter 7 requires that with any individual supply pump out of service, the remaining pump(s) shall be capable of providing the maximum daily pumping demand of the system. The District invested in the development of a new well which was put on-line in 2019. Figure 2 presents the District's maximum day demands for the years 2009 through 2019 (gray columns) along with the available supply with all wells pumping (red dashed line) and the available supply with the largest source off-line (red solid line). The addition of the new well in 2019 increased the

District's supply resiliency in meeting current and future maximum day demands with the largest source off-line.

Figure 2. Supply Demand Capacity Based on Maximum Day Demand



The District's sources of supply are all located within the Buzzard Bay Basin part of the Plymouth-Carver Aquifer, the thickest, highest yield portion of the aquifer. The additional withdrawal requested is a very small fraction of the available potentially allocatable water within this portion of the Plymouth-Carver Aquifer. As stated in the Massachusetts Sustainable Water Management Initiative Framework Appendices dated 2012, "the Plymouth-Carver Aquifer holds approximately 500 billion gallons of water. This is more than the Quabbin and Wachusett Reservoirs combined; over three years of average recharge is stored in the Plymouth-Carver Aquifer like a multi-year surface water reservoir." The increased withdrawal requested by the WMA Permit application of an additional 0.26 mgd to the permitted withdrawal is a small fraction of the available water supply and will have no significant environmental impact. The requested amount will increase the annual average withdrawal from 0.53 mgd to 0.79 mgd.

Should the District be unable to increase its annual withdrawal to meet the water needs being requested, potential customers would seek water from alternative sources such as installing private wells which may not meet the thresholds for regulation by a WMA Permit. Since the water supply would be from the same aquifer as the District's wells, the more sustainable and rational approach is to allow the District the ability to supply water to these customers.

The District intends on continuing its water conservation efforts to protect its valuable resource through efforts to reduce unaccounted for water and to encourage its customers to conserve water supply through prudent and responsible use.

Buzzards Bay Water District
Water Demand Projection Approach

The District's residential population for the prior 5-years was obtained from its Annual Statistical Reports (ASRs) Table DS-7. These population estimates are based on Population Option 2, Estimates from Households Served. Table 1 summarizes this data for 2015-2019.

Table 1. District Residential Population - Current

Year	District Residential Population - Current
2015	6579
2016	6602
2017	6646
2018	6656
2019	6660

Future population growth for the District is anticipated to continue in a linear trend. Table 2 presents the anticipated population for the years 2025, 2030, 2035 and 2040. This growth accounts for population growth within the existing customer base, from new development and connection of customers that currently have private wells.

Table 2. District Residential Population - Projected

Year	District Residential Population - Projected
2025	6693
2030	6801
2035	6909
2040	7017

The District experiences a seasonal population change. The ASRs System Information section shows a summer population of 7,700. The seasonal population may be much greater than this since this estimate is based on 2010 census data. However, for the purposes of this estimate, the seasonal population increase is assumed to be 1,100 since the 2019 population was estimated to be 6,660.

Based on the averages of the years 2015-2019, the District's current Base System Average Day Demand (ADD) is 0.50 mgd, the Residential ADD is 0.37 mgd, the Non-Residential ADD is 0.07 mgd.

Using the residential populations shown in Table 2 and adding the seasonal population of 1,100, assuming a residential use of 65 RGPCD, with moderate increases to the Non-Residential use and decrease of the UAW to progressively achieve the goal of 10%, the future demand needs are shown in Table 3. Note Table 3 shows both the estimated water needs calculated using the above approach and the projected demands included in the WMA Permit application which include a 10% buffer.

Table 3. District Water Needs

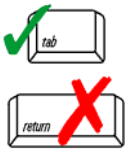
Year	District Estimated Water Needs Based on Approach Presented	District Projected Demands for WMA Permit Application
2025	0.69 mgd	0.76 mgd
2030	0.70 mgd	0.77 mgd
2035	0.71 mgd	0.78 mgd
2040	0.72 mgd	0.79 mgd

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form A - General Information

A. Facility Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Name of entity: water system, town, farm, company, or golf course

Buzzards Bay Water District
Name

15 Wallace Avenue
Street Address

Buzzards Bay	MA	02532
City	State	Zip Code

Steven Souza, Superintendent	(508) 759-4631
Contact Person Name/Title	Phone Number

2. Consultant Contact:

Resilient Civil Engineering, P.C.
Consultant Company Name

Kristen Berger, P.E.	President
Contact Person	Title

P.O. Box 659
Mailing Address

Marlborough	MA	01752
City	State	Zip Code

508-726-2458		kberger@resilientce.com
Phone Number	Fax Number	Email

B. Water Withdrawal Information

(Use totals from Form D - subtract registered volume if applicable.)

1. Volume requested (in MGD) for:

	Days/year to be used	Average day (mgd)	# months to be pumped
Years 1-5:	2020 - 2024	0.76	12
Years 6-10:	2025 - 2029	0.77	12
Years 11-15:	2030 - 2034	0.78	12
Years 16-20:	2035 - 2039	0.79	12

2. Number of withdrawal points: Groundwater (G): 5 Surface Water (S): _____

Name and type of withdrawal points (G or S):		Name of Watershed	Location (Town/City)
(a)Well 1	☒ G ☐ S	Buzzards Bay	Buzzards Bay
(b)Well 2	☒ G ☐ S	Buzzards Bay	Buzzards Bay
(c)Well 3	☒ G ☐ S	Buzzards Bay	Buzzards Bay
(d) Well 4	☒ G ☐ S	Buzzards Bay	Buzzards Bay
(e) Well 5	☒ G ☐ S	Buzzards Bay	Buzzards Bay

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form A - General Information

B. Water Withdrawal Information (cont.)

4. For what purpose will this water be used (in percent):

Agriculture:	0%	Cranberry:	0%
Commercial:	10%	Industrial:	0%
Residential:	83%	Golf:	0%
Other (please describe):	Municipal/Non-proifts		7%

5. Is this a public water supply? ☒ Yes ☐ No PWS ID No.: 4036001

6. For public water suppliers, are you using DCR Division of Water Supply Protection water needs forecast?

   ☒ Yes ☐ No

7. Permit time length requested: 20 Years
   Months or Years

   Please refer to Appendix B-Permit End Dates for permit end dates for the watershed of your withdrawal point(s) and refer to 310 CMR 36.34 for permit renewal information. Permits are renewable - refer to 310 CMR 36.24.

8. Do these withdrawal requests have new water withdrawals or construction which requires an Environmental Notification Form submittal to MEPA?

   ☐ Yes ☒ No

9. Name and address of the chief elected official or local water resources management official in the community(s) in which the withdrawal(s) are located and to whom a copy of this application will be forwarded:

   Wendy Chapman, Chairperson of Board of Water Commissioners
   Name
   15 Wallace Avenue
   Street Address

Buzzards Bay	MA	02532
City	State	Zip Code

10. Which new and existing sources are included in this permit application?

Source Name and Number	Reg. No. (if applicable)	New or Proposed	Maximum Daily Vol. Requested (mgd)
Well 1 (4036001-01G)	42403606		Registered
Well 2 (4036001-02G)	42403606		Registered
Well 3 (4036001-03G)	9P-4-24-036.01		0.86 (Permitted)
Well 4 (4036001-04G)	9P-4-24-036.01		0.58 (Permitted)
Well 5 (4036001-05G)	9P-4-24-036.01		1.18 (Permitted)

WMA Form A - General Information

11. Are any of these withdrawal points subject to DEP's Source Approval Process for public water suppliers?

☐ Yes ☒ No If yes, list their name(s):

Name(s)

B. Water Withdrawal Information (cont.)

12. Is some fraction of the water withdrawn to be discharged out of the basin (include ocean discharge if appropriate)?

☐ Yes ☒ No (check one)

a. If yes (to only one "out of the basin" destination), what fraction of the total discharge and to which basin?

____ % will be discharged to the ____ basin

b. If yes, and to more than one "out of basin" destination, what fraction of your total discharge and to which basins?

1) ____ % will be discharged to the ____ basin

2) ____ % will be discharged to the ____ basin

3) ____ % will be discharged to the ____ basin

4) ____ % will be discharged to the ____ basin

c. What fraction of the water to be used will be discharged to this basin? ____ %

1) ____ % discharged to a public sewer system?

2) ____ % discharged to on-site sewage disposal systems?

3) ____ % discharged to another alternative (please describe)?

____

13. Is there an NPDES discharge permit? ☐ Y ☒ N
(If so, provide permit number) ____ NPDES Permit Number

Provide volume and location of discharge point: ____

Groundwater discharge permit? ☐ Y ☐ N
(If so, provide permit number) ____ Groundwater Discharge Permit Number

Provide volume and location of discharge point: ____

14. What is the authorized NPDES daily discharge volume? ____ gallons per day

15. Is the discharge volume metered? ☐ Yes ☐ No

16. Is, or will, the demand for this withdrawal be supplemented by withdrawals from another river basin? ☐ Yes ☐ No
List withdrawals in other river basins, the location of each and average daily volumes (ADV) withdrawn from each:

WMA Form A - General Information

Watershed	ADV
Watershed	ADV
Watershed	ADV

B. Water Withdrawal Information (cont.)

17. Does this request require an Interbasin Transfer Act application to the Water Resources Commission?

☐ Yes ☒ No

C. Certification

I certify, under penalty of law, that this application and all attachments were prepared under my supervision, in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted in this application, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature of Applicant	Title	Date
	Superintendent	10/7/2020

Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

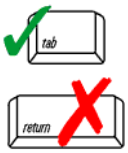
WMA Form B

Groundwater Withdrawal Point

Please provide a separate Form B for each withdrawal point source. Please answer only if the requested information is known and reliable.

A. Withdrawal Point Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Name and Address of Withdrawal Point

   Well 1
   Name of Withdrawal Point

   Dry Cedar Swamp Road
   Street Address

   Buzzards Bay | MA | 02532
   City | State | Zip Code

   4036001-01G
   Source Code (for public water supplies)

2. Has this well been registered? ☒ Yes ☐ No

   Month and year put in operation or planned: 1955

3. Has this well been in regular operation at any time? ☒ Yes ☐ No

   Month and year put in operation or planned: 1955

4. USGS quadrangle name: Sagamore

5. Latitude and Longitude: 42.465038 (Latitude) | -72.879742 (Longitude)

   Please provide a locus map of the withdrawal and any associated reservoirs or ponds.

B. Geologic Information

1. Aquifer type: ☐ Bedrock ☐ Confined ☒ Unconfined

2. Depth to bedrock: ~150 ft
   feet

C. Well Information

1. Well type: ☒ Gravel pack ☐ Gravel developed ☐ Tubular well field ☐ Dug well

   ☐ Other (describe): _____

2. Year to be installed (if not already installed): 1955

3. Well depth: 38 ft

4. Depth to water level when installed: 8.5 ft

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

C. Well Information (cont'd)

5. Name and address of well driller:

Data not available
Name of Withdrawal Point

Street Address

City | State | Zip Code

D. Pumping Information

1. Was a pump test conducted on this well? ☒ Yes ☐ No

   If yes, provide date: 1971

   Firm conducting the test: C.E. Maguire, Inc.

   If no, is one planned? ☐ Yes ☐ No

Items 2-7 are for Public Water Supplies.

2. Has a Zone II delineation been performed for this well? ☒ Yes ☐ No
3. If yes, has this Zone II been approved by the Department? ☒ Yes ☐ No
4. Date of Zone II delineation: 8/12/1993
5. Firm conducting Zone II delineation: Whitman & Howard
6. What is the maximum daily withdrawal rate? 0.504 mgd
7. Is this a DEP-approved withdrawal rate? ☒ Yes ☐ No

E. Meter Information

1. If in operation, is this well metered? ☒ Yes ☐ No
2. If proposed, when will meter(s) be installed? Date
3. Type of flow measurement device installed or planned:

   ☐ weir ☐ flume ☐ venturi ☒ other meter ☐ other (describe): Magnetic flow meter

4. Capacity of flow measurement device: 300 gpm
5. Recordings are: ☒ continuous ☐ manual
6. Last date of calibration, if in operation: 3/20/2020

Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

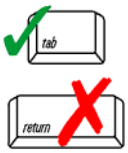
WMA Form B

Groundwater Withdrawal Point

Please provide a separate Form B for each withdrawal point source. Please answer only if the requested information is known and reliable.

A. Withdrawal Point Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Name and Address of Withdrawal Point

   Well 2
   Name of Withdrawal Point

   Kettle Lane off of Head of the Bay Road
   Street Address

   Buzzards Bay | MA | 02532
   City | State | Zip Code

   4036001-02G
   Source Code (for public water supplies)

2. Has this well been registered? ☒ Yes ☐ No

   Month and year put in operation or planned: 1958

3. Has this well been in regular operation at any time? ☒ Yes ☐ No

   Month and year put in operation or planned: 1958

4. USGS quadrangle name: Sagamore

5. Latitude and Longitude: 42.466867 (Latitude) | -72.882256 (Longitude)

   Please provide a locus map of the withdrawal and any associated reservoirs or ponds.

B. Geologic Information

1. Aquifer type: ☐ Bedrock ☐ Confined ☒ Unconfined

2. Depth to bedrock: ~150 ft
   feet

C. Well Information

1. Well type: ☒ Gravel pack ☐ Gravel developed ☐ Tubular well field ☐ Dug well

   ☐ Other (describe):

2. Year to be installed (if not already installed): 1958

3. Well depth: 42 ft

4. Depth to water level when installed: Unknown

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

C. Well Information (cont'd)

5. Name and address of well driller:

Data not available
Name of Withdrawal Point

Street Address

City | State | Zip Code

D. Pumping Information

1. Was a pump test conducted on this well? ☒ Yes ☐ No

   If yes, provide date: 1971

   Firm conducting the test: C.E. Maguire, Inc.

   If no, is one planned? ☐ Yes ☐ No

Items 2-7 are for Public Water Supplies.

2. Has a Zone II delineation been performed for this well? ☒ Yes ☐ No
3. If yes, has this Zone II been approved by the Department? ☒ Yes ☐ No
4. Date of Zone II delineation: 8/12/1993
5. Firm conducting Zone II delineation: Whitman & Howard
6. What is the maximum daily withdrawal rate? 0.46 mgd
7. Is this a DEP-approved withdrawal rate? ☒ Yes ☐ No

E. Meter Information

1. If in operation, is this well metered? ☒ Yes ☐ No
2. If proposed, when will meter(s) be installed? Date
3. Type of flow measurement device installed or planned:

   ☐ weir ☐ flume ☐ venturi ☒ other meter ☐ other (describe): Magnetic flow meter

4. Capacity of flow measurement device: 300 gpm
5. Recordings are: ☒ continuous ☐ manual
6. Last date of calibration, if in operation: 3/20/2020

Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

Please provide a separate Form B for each withdrawal point source. Please answer only if the requested information is known and reliable.

A. Withdrawal Point Information

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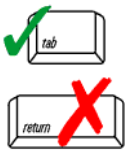

1. Name and Address of Withdrawal Point

   Well 3
   Name of Withdrawal Point

   Bournedale Road
   Street Address

   Buzzards Bay | MA | 02532
   City | State | Zip Code

   4036001-03G
   Source Code (for public water supplies)

2. Has this well been registered? ☒ Yes ☐ No

   Month and year put in operation or planned: 1989

3. Has this well been in regular operation at any time? ☒ Yes ☐ No

   Month and year put in operation or planned: 1989

4. USGS quadrangle name: Sagamore

5. Latitude and Longitude: 42.382572 (Latitude) | -73.088791 (Longitude)

   Please provide a locus map of the withdrawal and any associated reservoirs or ponds.

B. Geologic Information

1. Aquifer type: ☐ Bedrock ☐ Confined ☒ Unconfined

2. Depth to bedrock: ~150 ft
   feet

C. Well Information

1. Well type: ☒ Gravel pack ☐ Gravel developed ☐ Tubular well field ☐ Dug well

   ☐ Other (describe):

2. Year to be installed (if not already installed): 1989

3. Well depth: 89 ft

4. Depth to water level when installed: Unknown

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

C. Well Information (cont'd)

5. Name and address of well driller:

Data not available
Name of Withdrawal Point

Street Address

City | State | Zip Code

D. Pumping Information

1. Was a pump test conducted on this well? ☒ Yes ☐ No

   If yes, provide date: 1982

   Firm conducting the test: C.E Maguire, Inc.

   If no, is one planned? ☐ Yes ☐ No

Items 2-7 are for Public Water Supplies.

2. Has a Zone II delineation been performed for this well? ☒ Yes ☐ No
3. If yes, has this Zone II been approved by the Department? ☒ Yes ☐ No
4. Date of Zone II delineation: 8/12/1993
5. Firm conducting Zone II delineation: Whitman & Howard
6. What is the maximum daily withdrawal rate? 0.864 mgd
7. Is this a DEP-approved withdrawal rate? ☒ Yes ☐ No

E. Meter Information

1. If in operation, is this well metered? ☒ Yes ☐ No
2. If proposed, when will meter(s) be installed? Date
3. Type of flow measurement device installed or planned:

   ☐ weir ☐ flume ☐ venturi ☒ other meter ☐ other (describe): Magnetic flow meter

4. Capacity of flow measurement device: 600 gpm
5. Recordings are: ☒ continuous ☐ manual
6. Last date of calibration, if in operation: 3/20/2020

Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

Please provide a separate Form B for each withdrawal point source. Please answer only if the requested information is known and reliable.

A. Withdrawal Point Information

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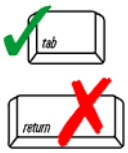


1. Name and Address of Withdrawal Point

   Well 4
   Name of Withdrawal Point

   Bournedale Road
   Street Address

   Buzzards Bay | MA | 02532
   City | State | Zip Code

   4036001-04G
   Source Code (for public water supplies)

2. Has this well been registered? ☒ Yes ☐ No

   Month and year put in operation or planned: 1989

3. Has this well been in regular operation at any time? ☒ Yes ☐ No

   Month and year put in operation or planned: 1989

4. USGS quadrangle name: Sagamore

5. Latitude and Longitude: 42.381953 (Latitude) | -73.0866 (Longitude)

   Please provide a locus map of the withdrawal and any associated reservoirs or ponds.

B. Geologic Information

1. Aquifer type: ☐ Bedrock ☐ Confined ☒ Unconfined

2. Depth to bedrock: ~150 ft
   feet

C. Well Information

1. Well type: ☒ Gravel pack ☐ Gravel developed ☐ Tubular well field ☐ Dug well

   ☐ Other (describe):

2. Year to be installed (if not already installed): 1989

3. Well depth: 64 ft

4. Depth to water level when installed: 18 ft

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

C. Well Information (cont'd)

5. Name and address of well driller:

Data not available
Name of Withdrawal Point

Street Address

City | State | Zip Code

D. Pumping Information

1. Was a pump test conducted on this well? ☒ Yes ☐ No

   If yes, provide date: 1982

   Firm conducting the test: C.E. Maguire, Inc.

   If no, is one planned? ☐ Yes ☐ No

Items 2-7 are for Public Water Supplies.

2. Has a Zone II delineation been performed for this well? ☒ Yes ☐ No
3. If yes, has this Zone II been approved by the Department? ☒ Yes ☐ No
4. Date of Zone II delineation: 8/12/1993
5. Firm conducting Zone II delineation: Whitman & Howard
6. What is the maximum daily withdrawal rate? 0.576 mgd
7. Is this a DEP-approved withdrawal rate? ☒ Yes ☐ No

E. Meter Information

1. If in operation, is this well metered? ☒ Yes ☐ No
2. If proposed, when will meter(s) be installed? Date
3. Type of flow measurement device installed or planned:

   ☐ weir ☐ flume ☐ venturi ☒ other meter ☐ other (describe): Magnetic Flow Meter

4. Capacity of flow measurement device: 400 gpm
5. Recordings are: ☐ continuous ☐ manual
6. Last date of calibration, if in operation: 3/20/2020

Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

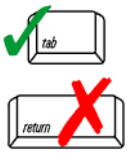
WMA Form B

Groundwater Withdrawal Point

Please provide a separate Form B for each withdrawal point source. Please answer only if the requested information is known and reliable.

A. Withdrawal Point Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Name and Address of Withdrawal Point

   Well 5
   Name of Withdrawal Point

   Bournedale Road
   Street Address

   Buzzards Bay | MA |
   City | State | Zip Code

   4036001-05G
   Source Code (for public water supplies)

2. Has this well been registered? ☒ Yes ☐ No

   Month and year put in operation or planned: Feb 2019

3. Has this well been in regular operation at any time? ☒ Yes ☐ No

   Month and year put in operation or planned: Feb 2019

4. USGS quadrangle name: Sagamore

5. Latitude and Longitude: 41.77416 (Latitude) | -70.583591 (Longitude)

   Please provide a locus map of the withdrawal and any associated reservoirs or ponds.

B. Geologic Information

1. Aquifer type: ☐ Bedrock ☐ Confined ☒ Unconfined

2. Depth to bedrock: ~150 ft
   feet

C. Well Information

1. Well type: ☒ Gravel pack ☐ Gravel developed ☐ Tubular well field ☐ Dug well

   ☐ Other (describe):

2. Year to be installed (if not already installed): 2019

3. Well depth: 70 ft

4. Depth to water level when installed: 9 ft

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

WMA Form B

Groundwater Withdrawal Point

C. Well Information (cont'd)

5. Name and address of well driller:

D.L. Maher
Name of Withdrawal Point

7 Sculley Road
Street Address

Ayer	MA	01432
City	State	Zip Code

D. Pumping Information

1. Was a pump test conducted on this well? ☒ Yes ☐ No

   If yes, provide date: 2015

   Firm conducting the test: OSD LLC

   If no, is one planned? ☐ Yes ☐ No

Items 2-7 are for Public Water Supplies.

2. Has a Zone II delineation been performed for this well? ☒ Yes ☐ No
3. If yes, has this Zone II been approved by the Department? ☒ Yes ☐ No
4. Date of Zone II delineation: 2015
5. Firm conducting Zone II delineation: OSD LLC
6. What is the maximum daily withdrawal rate? 1.18 mgd
7. Is this a DEP-approved withdrawal rate? ☒ Yes ☐ No

E. Meter Information

1. If in operation, is this well metered? ☒ Yes ☐ No
2. If proposed, when will meter(s) be installed? _____ Date
3. Type of flow measurement device installed or planned:

   ☐ weir ☐ flume ☐ venturi ☒ other meter ☐ other (describe): Magnetic Flow Meter

4. Capacity of flow measurement device: 550 - 12500 gpm
5. Recordings are: ☒ continuous ☐ manual
6. Last date of calibration, if in operation: 3/20/2020

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D1

Computation of Historic Withdrawal Volume

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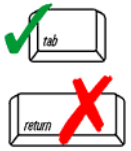

Check applicable item:

☒ Combined grand total form

☐ Individual withdrawal point Withdrawal point name: _____

1. Even if the withdrawal point is registered, please complete the entire form for each withdrawal point.
2. For each withdrawal point in your application, fill out the charts below to show total monthly historic withdrawal volume in millions of gallons. NOTE: 100,000 gallons = 0.10 MG
3. **Add** the individual withdrawal point volumes and enter onto a separate Form D1 (a Combined Grand Total form) to show the total monthly historic withdrawal volumes.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2009	11.25	9.26	11.27	11.65	14.32	15.20	17.50	19.49	14.72	11.92	10.40	10.95	157.94
2010	9.91	8.7	10.65	11.50	16.97	18.87	26.60	20.98	17.22	12.81	10.55	11.26	175.99
2011	11.17	9.63	11.29	11.23	13.95	17.97	22.40	18.80	15.95	13.02	10.45	10.18	164.29
2012	10.33	8.79	10.38	12.46	14.93	16.33	23.13	18.74	15.69	12.87	10.45	10.18	164.29
2013	10.21	10.61	11.40	11.21	14.43	16.23	19.27	20.10	15.77	14.08	10.85	10.71	164.85
2014	10.27	10.54	11.00	10.79	14.47	21.09	22.53	21.53	17.30	12.26	10.69	10.20	172.67
2015	10.85	11.58	14.22	10.77	18.36	20.17	22.17	22.97	20.19	13.68	11.28	10.2	186.96
2016	10.84	9.70	11.22	11.56	15.54	21.55	25.54	23.97	17.75	13.75	10.75	10.87	183.02
2017	10.12	9.27	10.75	11.02	13.47	16.21	21.84	21.87	16.13	13.85	10.92	11.13	166.58
2018	11.60	8.98	11.29	11.81	15.38	19.64	24.85	21.54	17.40	13.79	12.26	13.23	181.78
2019	13.45	10.75	12.56	13.22	16.34	18.16	22.81	22.02	17.78	14.24	12.48	11.60	185.41

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D1

Computation of Historic Withdrawal Volume

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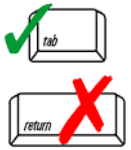

Check applicable item:

☐ Combined grand total form

☒ Individual withdrawal point Withdrawal point name: Well 1

1. Even if the withdrawal point is registered, please complete the entire form for each withdrawal point.
2. For each withdrawal point in your application, fill out the charts below to show total monthly historic withdrawal volume in millions of gallons. NOTE: 100,000 gallons = 0.10 MG
3. **Add** the individual withdrawal point volumes and enter onto a separate Form D1 (a Combined Grand Total form) to show the total monthly historic withdrawal volumes.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2009	2.13	1.95	3.11	3.25	2.59	3.37	3.68	3.36	2.61	2.24	1.72	2.15	32.14
2010	1.58	1.45	1.86	2.21	2.83	3.65	5.16	3.68	2.88	2.24	2.02	1.91	31.46
2011	2.23	1.99	1.86	1.72	2.45	2.95	4.33	4.24	3.04	2.27	1.69	1.68	30.45
2012	1.79	1.32	1.89	1.80	2.79	2.97	2.48	4.01	2.67	2.44	1.92	1.81	27.88
2013	1.57	2.17	1.80	1.76	2.86	2.96	3.39	4.28	2.43	2.21	1.18	1.71	28.33
2014	1.75	1.80	1.79	1.60	3.15	4.25	4.66	3.72	3.29	2.24	1.82	1.80	31.88
2015	2.13	2.32	2.33	2.06	3.22	3.44	3.64	4.05	3.54	2.89	1.92	1.67	33.20
2016	1.67	1.75	1.63	1.91	2.32	3.62	4.95	3.89	3.28	2.35	1.74	1.75	30.86
2017	1.45	1.57	1.61	1.67	2.01	1.09	0.03	4.73	3.76	2.31	2.79	2.18	25.21
2018	3.77	2.82	4.03	3.94	5.81	5.70	8.29	7.20	5.72	4.86	2.49	3.40	58.04
2019	3.21	2.03	2.34	2.79	2.93	3.35	4.07	3.98	2.79	3.66	2.50	1.87	35.53

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D1

Computation of Historic Withdrawal Volume

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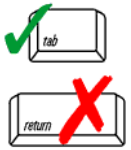

Check applicable item:

☐ Combined grand total form

☒ Individual withdrawal point Withdrawal point name: Well 2

1. Even if the withdrawal point is registered, please complete the entire form for each withdrawal point.
2. For each withdrawal point in your application, fill out the charts below to show total monthly historic withdrawal volume in millions of gallons. NOTE: 100,000 gallons = 0.10 MG
3. **Add** the individual withdrawal point volumes and enter onto a separate Form D1 (a Combined Grand Total form) to show the total monthly historic withdrawal volumes.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2009	2.07	0.71	0.00	1.07	3.93	3.53	4.72	4.21	3.11	2.41	2.34	2.64	30.73
2010	2.26	1.90	2.21	2.15	3.69	3.49	5.32	4.39	3.84	2.74	2.04	2.94	36.96
2011	2.07	1.72	2.53	2.63	2.92	4.04	4.21	4.36	3.59	2.76	2.42	2.30	35.54
2012	2.15	2.09	2.03	2.96	2.87	3.21	4.66	3.54	3.96	2.75	2.70	2.23	35.16
2013	2.52	2.10	2.54	2.47	2.88	3.20	4.23	4.74	3.38	3.10	3.04	2.22	36.43
2014	2.29	1.86	2.41	2.57	2.41	4.14	4.74	4.81	3.56	2.74	2.50	2.20	36.24
2015	1.95	2.76	3.16	2.02	4.06	0.44	4.96	4.82	4.32	2.60	2.37	2.45	35.91
2016	2.29	2.10	2.51	2.35	3.61	4.74	4.98	5.19	3.42	3.58	2.27	2.33	39.36
2017	2.20	1.77	2.30	2.33	2.82	4.74	5.37	3.43	2.46	3.44	1.92	2.82	35.61
2018	3.18	2.69	3.05	2.85	4.10	5.11	6.80	6.07	4.70	1.12	2.55	2.53	44.75
2019	2.28	1.47	1.65	1.98	2.79	3.24	3.74	3.08	3.13	3.94	2.18	1.52	31.02

Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D1

Computation of Historic Withdrawal Volume

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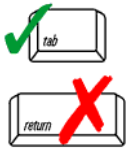

Check applicable item:

☐ Combined grand total form

☒ Individual withdrawal point Withdrawal point name: Well 3

1. Even if the withdrawal point is registered, please complete the entire form for each withdrawal point.
2. For each withdrawal point in your application, fill out the charts below to show total monthly historic withdrawal volume in millions of gallons. NOTE: 100,000 gallons = 0.10 MG
3. **Add** the individual withdrawal point volumes and enter onto a separate Form D1 (a Combined Grand Total form) to show the total monthly historic withdrawal volumes.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2009	3.89	3.72	3.68	3.83	3.43	4.98	7.05	6.21	4.84	4.07	3.22	3.25	52.17
2010	3.01	2.79	3.58	3.74	5.48	7.03	9.13	7.28	5.43	4.23	3.79	3.36	55.49
2011	3.76	3.00	3.52	3.39	4.73	5.67	8.21	3.91	4.83	4.84	3.10	3.28	52.23
2012	3.53	2.61	3.80	4.17	5.28	5.93	8.88	5.33	5.86	6.40	4.60	4.28	60.67
2013	3.06	3.54	3.67	3.56	3.16	6.31	6.27	3.28	6.01	4.71	3.12	4.14	50.82
2014	3.47	4.89	3.58	3.48	4.76	7.20	7.73	6.73	5.85	3.95	3.39	2.44	57.47
2015	4.09	3.28	4.66	3.40	5.23	6.87	7.06	7.45	6.46	3.47	4.01	3.57	59.54
2016	3.96	3.53	3.73	4.04	4.85	7.51	9.96	8.03	10.41	3.96	3.69	3.46	67.17
2017	3.45	3.37	3.66	3.77	4.59	5.42	9.34	7.10	6.67	4.04	3.61	2.22	57.25
2018	0	0	0	0	0	0	0	0	0	2.22	4.24	2.38	8.84
2019	3.53	2.70	2.35	2.27	3.31	3.65	7.06	5.27	4.05	2.03	2.37	2.29	40.88

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D1

Computation of Historic Withdrawal Volume

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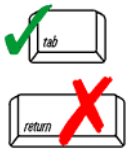

Check applicable item:

☐ Combined grand total form

☒ Individual withdrawal point Withdrawal point name: Well 4

1. Even if the withdrawal point is registered, please complete the entire form for each withdrawal point.
2. For each withdrawal point in your application, fill out the charts below to show total monthly historic withdrawal volume in millions of gallons. NOTE: 100,000 gallons = 0.10 MG
3. **Add** the individual withdrawal point volumes and enter onto a separate Form D1 (a Combined Grand Total form) to show the total monthly historic withdrawal volumes.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2009	3.16	2.88	4.48	3.51	4.37	3.32	2.05	5.71	4.16	3.21	3.12	2.92	42.89
2010	3.06	2.57	2.99	3.40	4.96	4.69	6.99	5.64	5.07	3.60	2.70	3.06	45.67
2011	3.11	2.93	3.38	3.49	3.84	5.30	5.65	6.30	4.49	3.15	3.25	3.03	47.92
2012	2.86	2.77	2.66	3.52	4.00	4.22	7.11	5.86	3.21	1.27	1.23	1.86	40.58
2013	3.07	2.79	3.39	3.41	5.53	3.76	5.38	7.80	3.94	4.05	3.51	2.64	49.28
2014	2.76	1.98	3.22	3.14	4.15	5.51	5.40	6.26	4.60	3.33	2.97	3.76	47.07
2015	2.69	3.23	4.08	3.28	5.85	5.42	6.51	6.65	5.87	4.72	2.98	3.03	54.32
2016	2.91	2.31	3.34	3.26	4.76	5.68	5.65	6.87	0.64	3.86	3.05	3.30	45.63
2017	3.02	2.55	3.17	3.24	4.05	4.96	7.11	6.61	3.24	4.07	2.61	3.90	48.52
2018	4.65	3.47	4.20	5.02	5.47	8.81	9.76	8.27	6.99	5.59	2.98	4.93	70.15
2019	4.42	2.19	3.03	2.71	2.43	2.44	4.90	3.80	3.72	2.13	2.71	2.51	37.00

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D1

Computation of Historic Withdrawal Volume

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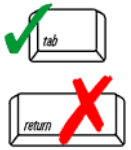


Check applicable item:

☐ Combined grand total form

☒ Individual withdrawal point Withdrawal point name: Well 5

1. Even if the withdrawal point is registered, please complete the entire form for each withdrawal point.
2. For each withdrawal point in your application, fill out the charts below to show total monthly historic withdrawal volume in millions of gallons. NOTE: 100,000 gallons = 0.10 MG
3. **Add** the individual withdrawal point volumes and enter onto a separate Form D1 (a Combined Grand Total form) to show the total monthly historic withdrawal volumes.

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
2009													
2010													
2011													
2012													
2013													
2014													
2015													
2016													
2017													
2018													
2019	0	2.36	3.19	3.46	4.87	5.46	3.04	5.88	4.09	2.48	2.71	3.65	41.20

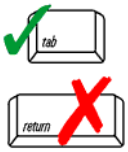
Please do not mail. Submit through ePlace. See instructions.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D2

Projection of Withdrawal Volume - Years 1-20

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Fill in the projected daily average water withdrawal in millions of gallons in Column 1. NOTE: 100,000 gallons = 0.10 MG
2. In Column 2, fill in the number of days you expect to operate. For **year-round withdrawals**, enter 365 days. For **seasonal withdrawals**, multiply the number of months that you will operate each year by 30 to get the days of operation (e.g., a golf course that irrigates during April, May, June, July, August, September, and October would enter 7 months of operation x 30 days = 210 days of operation).
3. Multiply the average daily water withdrawal (Column 1) by the days of operation (Column 2) to get the total annual water withdrawal. Enter the number in Column 3.

	Year	Average Daily Withdrawal Volume	Days of Operation	Total Annual Water Withdrawal
Years 1-5	2020	0.76	365	277.4
	2021	0.76	365	277.4
	2022	0.76	365	277.4
	2023	0.76	365	277.4
	2024	0.76	365	277.4
Years 6-10	2025	0.77	365	281.05
	2026	0.77	365	281.05
	2027	0.77	365	281.05
	2028	0.77	365	281.05
	2029	0.77	365	281.05
Years 11-15	2030	0.78	365	284.70
	2031	0.78	365	284.70
	2032	0.78	365	284.70
	2033	0.78	365	284.70
	2034	0.78	365	284.70
Years 16-20	2035	0.79	365	288.35
	2036	0.79	365	288.35
	2037	0.79	365	288.35
	2038	0.79	365	288.35
	2039	0.79	365	288.35

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D2

Projection of Withdrawal Volume - Years 1-20

4. The requested withdrawal volume during Years 1-5, Years 6-10, Years 11-15 and Years 16-20 of the permit period is shown in Column 1.

   Average daily withdrawal volumes: 0.76 (Years 1-5) | 0.77 (Years 6-10) | 0.78 (Years 11-15) | 0.79 (Years 16-20)

5. If part of this volume is registered, subtract the registered volume from the average daily withdrawal volumes for Years 1-5, Years 6-10, Years 11-15 and Years 16-20 to get the requested permit volumes.

0.76	-	0.37	=	0.39
Average daily withdrawal volume for Years 1-5		Registered volume		Requested permit volume for Years 1-5
0.77	-	0.37	=	0.40
Average daily withdrawal volume for Years 6-10		Registered volume		Requested permit volume for Years 6-10
0.78	-	0.37	=	0.41
Average daily withdrawal volume for Years 11-15		Registered volume		Requested permit volume for Years 11-15
0.79	-	0.37	=	0.42
Average daily withdrawal volume for Years 16-20		Registered volume		Requested permit volume for Years 16-20

6. Enter these requested permit volumes on Form A, Number 5, Years 1-5, Years 6-10, Years 11-15, and Years 16-20.

For withdrawals with seasonal variation

7. Withdrawals are often made at varying rates over the course of the season or year. For example, golf courses typically irrigate for six or seven months per year, with peak irrigation taking place during the summer months; an industry might eliminate one shift during the summer; or a public water supplier might have a large summer population to supply.

   If your withdrawal has large seasonal variations, please show the pattern of monthly withdrawals for a typical year in the space below. The numbers you use can be actual projections for one year during the permit period.

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

   If you expect the seasonal variation in your withdrawal to change during the permit period, or if you feel that there is any unique aspect to the pattern of your withdrawal, please provide that information in the space below.

-- Continued on following page --

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program

Form WMA-D2

Projection of Withdrawal Volume - Years 1-20

8. For each withdrawal point in your application provide the portion (percent) of the projected withdrawal that you expect to take from each withdrawal point, e.g., Well #1 = 25%, Well 2 = 25%, Well 3 = 50%.

Year	Well 1 Point Name	Well 2 Point Name	Well 3 Point Name	Well 4 Point Name	Well 5 Point Name
2020	20%	20%	20%	20%	20%
2021	20%	20%	20%	20%	20%
2022	20%	20%	20%	20%	20%
2023	20%	20%	20%	20%	20%
2024	20%	20%	20%	20%	20%
2025	20%	20%	20%	20%	20%
2026	20%	20%	20%	20%	20%
2027	20%	20%	20%	20%	20%
2028	20%	20%	20%	20%	20%
2029	20%	20%	20%	20%	20%
2030	20%	20%	20%	20%	20%
2031	20%	20%	20%	20%	20%
2032	20%	20%	20%	20%	20%
2033	20%	20%	20%	20%	20%
2034	20%	20%	20%	20%	20%
2035	20%	20%	20%	20%	20%
2036	20%	20%	20%	20%	20%
2037	20%	20%	20%	20%	20%
2038	20%	20%	20%	20%	20%
2039	20%	20%	20%	20%	20%

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program
WMA Form F- Evaluation of Potential Effects of Proposed Withdrawal

Please address these questions separately for each proposed withdrawal point, as well as the effect of your entire withdrawal. Please reference any tests, studies or reports you use to provide information here.

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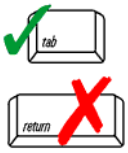

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1. Withdrawal point(s):

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Will the water be discharged to a stream ☐ pond ☐ reservoir ☐, individual septic system ☒ ?

If the water will not be discharged to a treatment system, please provide a map showing the points of withdrawal and discharge.

What pollutants will be added or removed in the discharge? Solids remova and some bacteria, virus, pathogen and nitrogen removall

Will the treatment system have the capacity to process that volume of water? ☒ Yes ☐ No

How does the volume of the discharge compare with the volume of the receiving waters?

Wetlands:

Will work on any part of the property on which the withdrawal is to be made be covered by or require an Order of Conditions under M.G.L. c. 131, s. 40?

If yes, please attach a copy of the Order of Conditions. ☐ Yes ☒ No

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Wildlife, Fisheries and Floral Habitat:

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Rare/threatened or special concern species ☐ Yes ☒ No

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Withdrawal points - Wildlife, Fisheries and Floral Habitat: (cont.)

Major coolwater/warmwater fisheries ☐ Yes ☒ No

Native and/or wild salmonid populations ☐ Yes ☒ No

Seasonally stocked trout waters ☐ Yes ☒ No

Agriculture:

Is the withdrawal within ¼ mile of any farming operation? ☐ Yes ☒ No

Describe the effect of the withdrawal on water supply or quality for any of these farming operations.

Navigation or Recreational User:

Is this withdrawal made directly from or adjacent to a navigable:

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If so, describe how the withdrawal will affect water levels.

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Water-Based Recreation:

Water-based recreation includes fishing, boating, swimming, wading, etc.

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Describe any studies that have been done of the recharge area to this well. (Attach a copy of the Form H - Groundwater Hydraulic Analyses for Non-Potable Wells or other studies.)

Will the project include any paving over of any aquifer recharge area? ☐ Yes ☒ No

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Floodplains:

Is the withdrawal within the 100-year floodplain? ☐ Yes ☒ No

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Water Management Act Program
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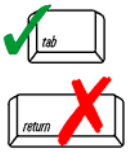

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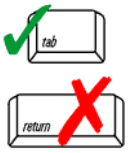

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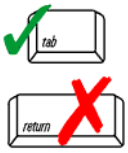

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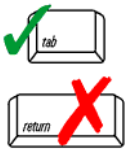

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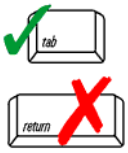

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Withdrawal points - Wildlife, Fisheries and Floral Habitat: (cont.)

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WMA Form G - Alternatives to Proposed Withdrawal

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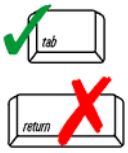

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1. The proposed withdrawal. (Use the information on the proposed withdrawal for comparison with any other alternatives available.)

   Cost: _____

   Feasibility: Refer to attachment.

   Environmental effect (summarized):

   _____

   Impact on others: _____

2. Leak detection alternative. Cost: _____

   Feasibility: _____

   Environmental effect (summarized):

   _____

   Impact on others: _____

   Reduction in volume withdrawn: _____

   Other comments: _____

3. Increased conservation and demand management. Cost: _____

   Feasibility: _____

   Environmental effect (summarized):

   _____

   Impact on others: _____

   Reduction in volume withdrawn: _____

   Other comments: _____

-- continue on next page --

WMA Form G - Alternatives to Proposed Withdrawal

4. Alternative Withdrawal Points. Cost: _____

   Feasibility: _____

   Environmental effect (summarized):

   _____

   Impact on others: _____

   Reduction in volume withdrawn: _____

   Other comments: _____

5. No action alternative. Cost: _____

   Feasibility: _____

   Environmental effect (summarized):

   _____

   Impact on others: _____

   Reduction in volume withdrawn: _____

   Other comments: _____

6. Alternative. Cost: _____

   Feasibility: _____

   Environmental effect (summarized):

   _____

   Impact on others: _____

   Reduction in volume withdrawn: _____

   Other comments: _____

   -- Continue in this format for as many alternatives as you have. --

WMA Form G – Alternatives to Proposed Withdrawal

Attachment

1. Proposed Withdrawal
    a. Cost: Approximately $50,000
        i. Additional electrical and chemical costs to pump and treat the additional water required.
    b. Feasibility
        i. Additional annual withdrawal from the District's existing wells requires no new construction. Only costs are the additional operation and maintenance costs (chemical and electrical) to withdraw the additional water.
    c. Environmental effect
        i. Minimal to no environmental impact since the wells draw from the thickest, highest-yield portion of the Plymouth-Carver Aquifer. The additional withdrawal requested is a very small fraction of the available potentially allocatable water within this portion of the Plymouth-Carver Aquifer.

2. Leak Detection Alternative
    a. Cost: Approximately $10,000 to 15,000 annually
    b. Feasibility
        i. The District routinely conducts leak detection using both in house staff and equipment and outside leak detection experts.
        ii. The District conducts annual production/master meter testing and calibration using an outside contractor. The District also includes service meter testing, replacement and repair in its annual budget.
    c. Environmental effect
        i. Minimal to no environmental impact since the District's unaccounted for water (UAW) was less than 10% from 2009 to 2017. The UAW did increase to 12% in 2018 and 17% in 2019. The District has actively been searching for leaks and pursuing other possibilities such as meter inaccuracies that may contribute to UAW.
        ii. The District's efforts to reduce the unaccounted for water include the following:
            1. Actively conducting leak detection using the District's own staff and equipment (about 7 miles per year).
            2. Currently under contract with Sarian Company, Inc. for additional leak detection services.
            3. Currently working with consultants to review the District's practices to assess the UAW issues.
            4. Annual calibration of the master/production meters which have been found to be accurate.
            5. Plan to verify SCADA programming for totalizing of daily production based on flow meters which are magnetic flow meters. These meters measure instantaneous flows which is used to calculate the daily totals.

6. The UAW started increasing after Well 5 went on-line. While this may be a coincidence in timing, the District did retain Sarian to listen for leaks along the discharge main from Well 5. The District also dug and exposed the pipe end connections along this main. No leaks were discovered.
7. The District has reviewed their metered customer usage and no anomalies were found.
8. The District replaces customer meters when low or no use is detected.
9. The District tests large customer meters.

d. Impact on others
    i. Leak detection has no impact on others.
e. Reduction in volume withdrawn
    i. The amount of UAW that is greater than 10% was about 0.011 mgd in 2018 and 0.034 mgd in 2019. This is the amount that the District is attempting to discover through leak detection and other means.
f. Other comments

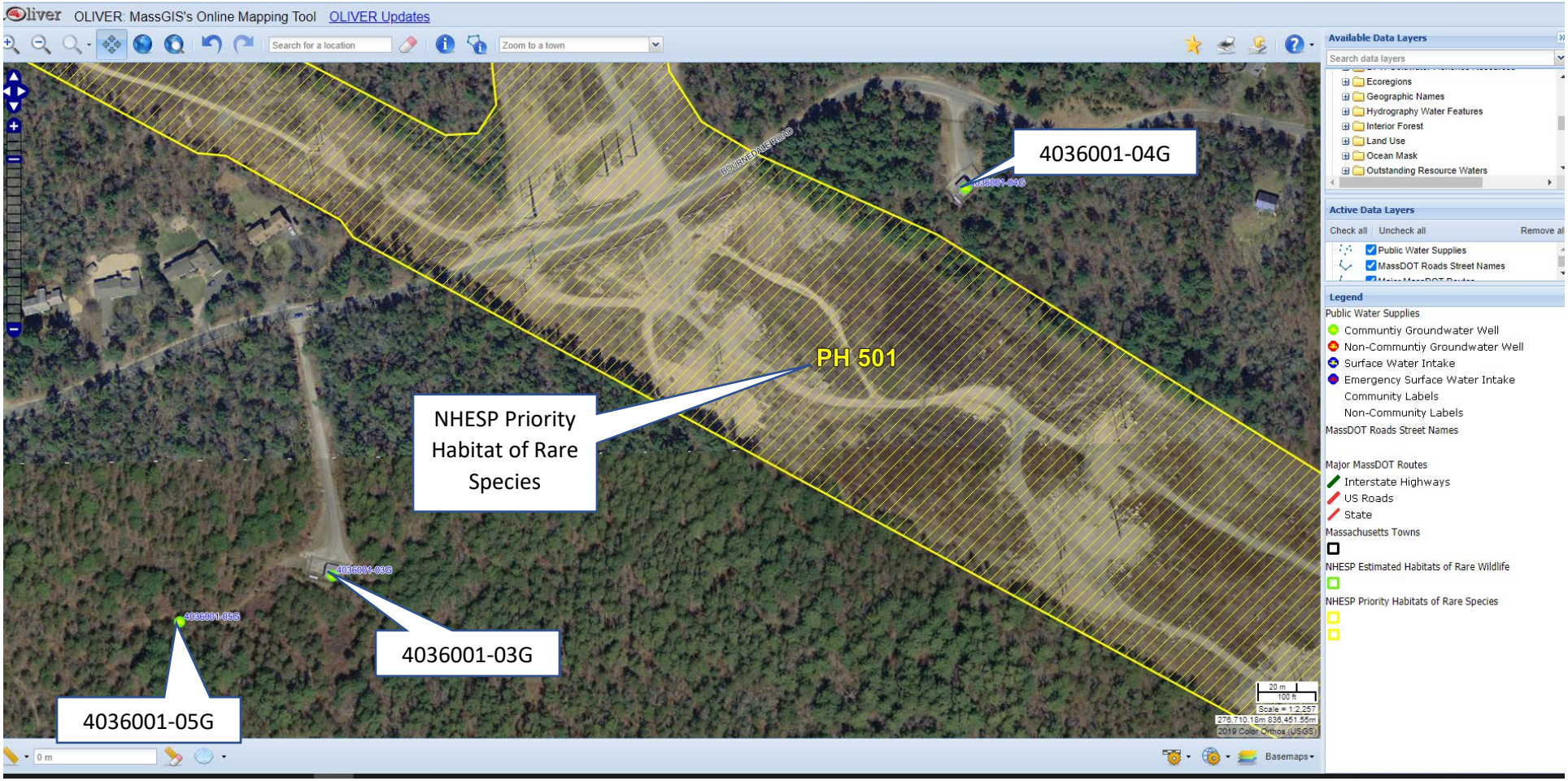
3. Increased Conservation and Demand Management
    a. Cost: Approximately $5,000 annually
    b. Feasibility
        i. The District has a written Water Conservation Program and allocates $5,000 in its annual operation and maintenance budget toward conservation efforts. The District also has written Drought Management and Emergency Response Plans.
        ii. The District has an increasing block rate structure to encourage water conservation.
        iii. The District meters residential use and estimates the residential per capita use to be less than 50 gallons per person per day which indicates less reliance on water for non-essential uses.
        iv. The District implements voluntary Odd/Even water use restrictions on outdoor water use each summer (June 1st through September 1st).
    c. Environmental effect
        i. Minimal to no impact since the District residential use has been on a decreasing trend over the past 10 years and is below the standard goals.
    d. Impact on others
        i. No impact on other as the District will continue to encourage its customers to conserve water.
    e. Reduction in volume withdrawn
        i. No reduction in volume withdrawn.
    f. Other comments

4. Alternative Withdrawal Points
    a. Cost: Millions of dollars
    b. Feasibility

        i. Whether this is a new well or an interconnection with another public water supplier the water will be withdrawn from the Plymouth-Carver Aquifer which does not offer any environmental benefits and is cost prohibitive.
    c. Environmental effect
        i. Minimal to no effect.
    d. Impact on others
        i. Great impact on all since this would involve significant capital investment.
    e. Reduction in volume withdrawn
        i. No reduction since the water would be withdrawn from the same aquifer as the District's wells.
    f. Other comments

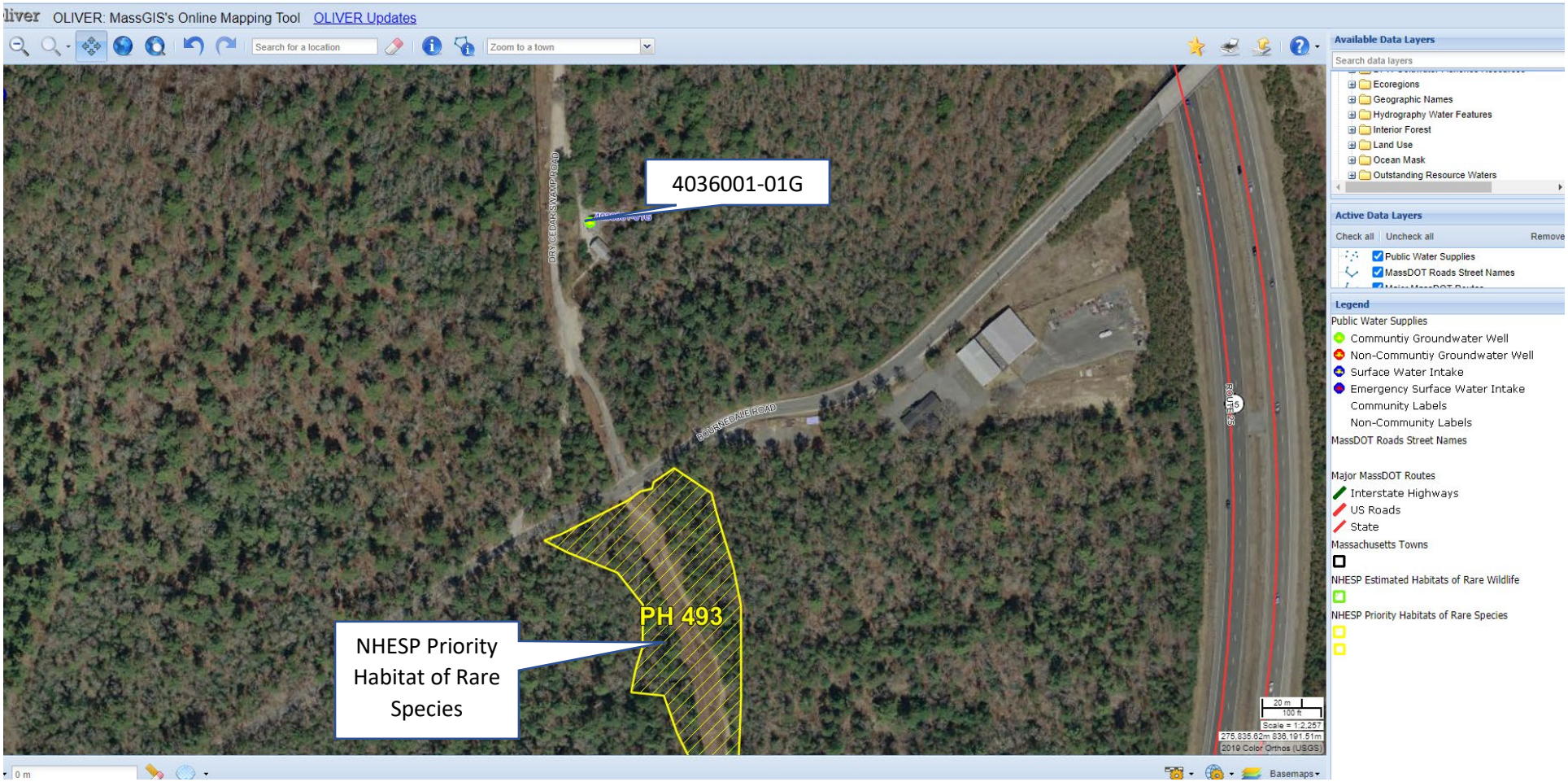
5. No Action Alternative
    a. Cost: Hundreds of Thousands of Dollars
    b. Feasibility
        i. No action would require those looking to connect to the District's system to pursue alternative water supplies such as installing their own wells which may not be regulated through a WMA permit. Additionally, proposed developments would create new very small public water suppliers for MassDEP to regulate. Allowing for additional water supply by the District offers the greatest protection to public health and the environment.
    c. Environmental effect
        i. Significant since wells would be installed and not regulated.
    d. Impact on others
        i. Significant since individuals looking to connect to the District's system would need to install their own wells.
    e. Reduction in volume withdrawn
        i. No reduction since the water would be withdrawn from the same aquifer as the District's wells.
    f. Other comments

Figure 1. NHESP Habitat Areas and Wells 3, 4 and 5



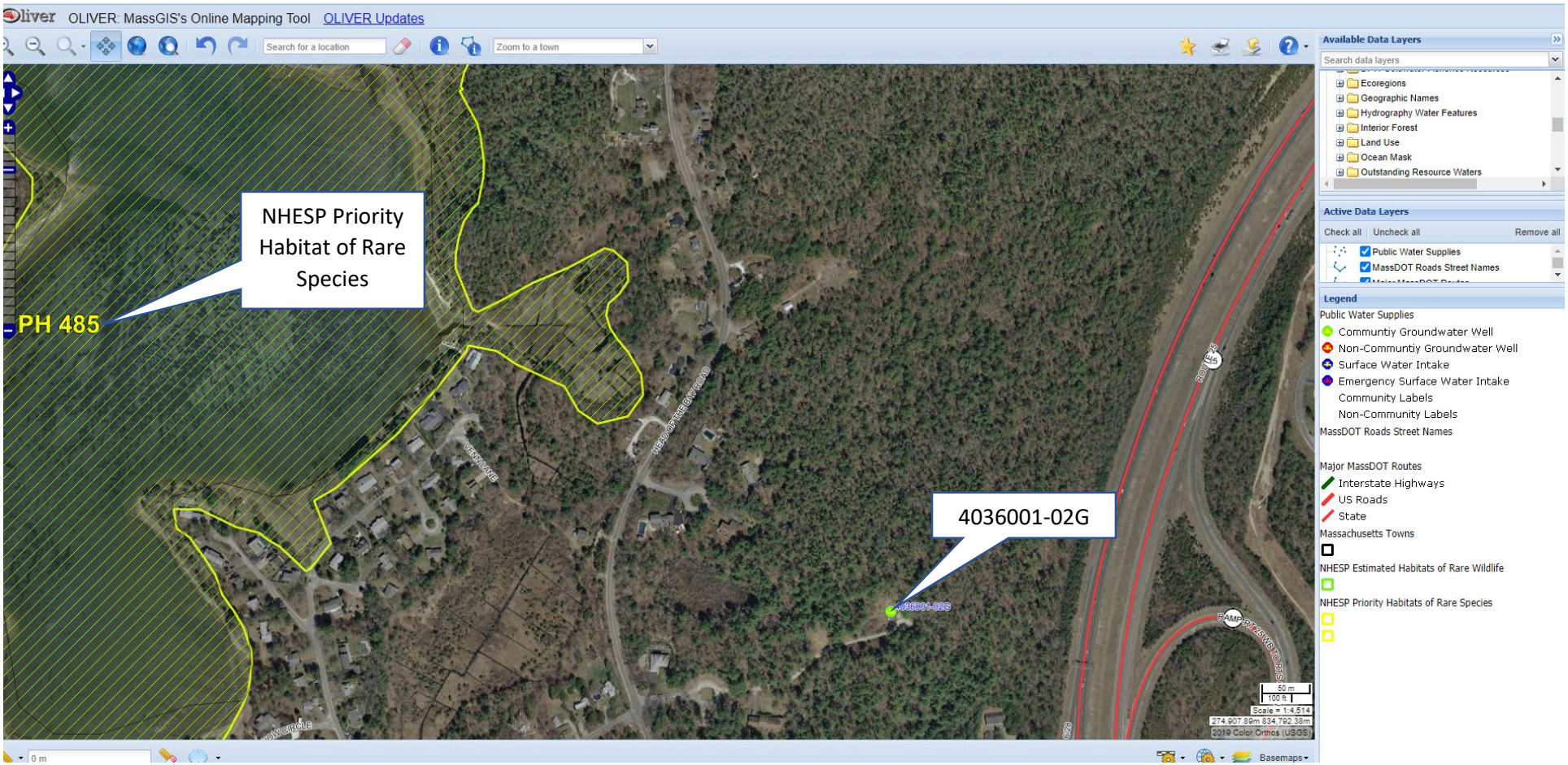
Note wells are located outside of NHESP Priority Habitat of Rare Species designated area.

Figure 2. NHESP Habitat Areas and Well 1



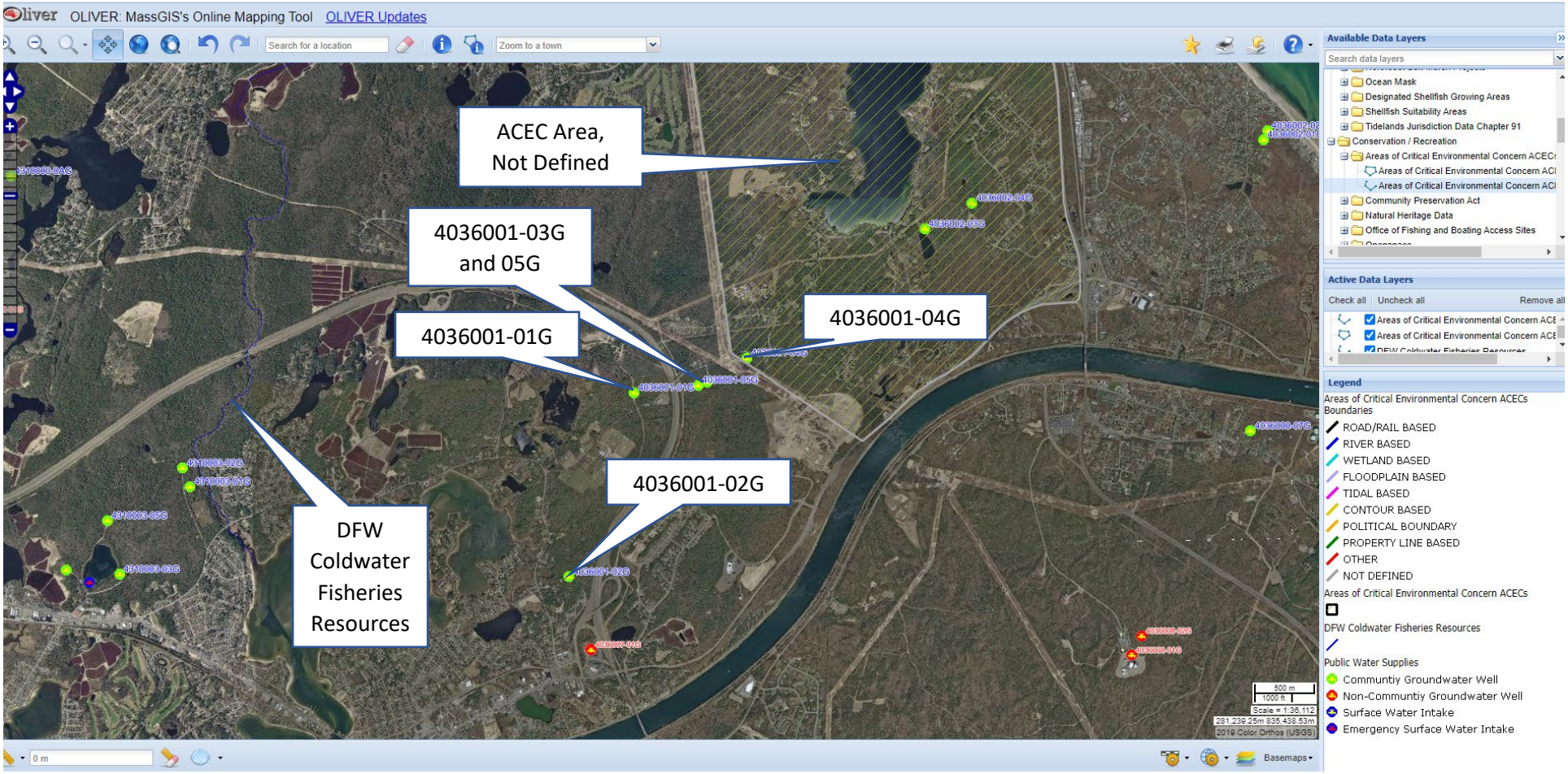
Note wells are located outside of NHESP Priority Habitat of Rare Species designated area.

Figure 3. NHESP Habitat Areas and Well 2



Note wells are located outside of NHESP Priority Habitat of Rare Species designated area.

Figure 4. Areas of Critical Environmental Concern (ACEC), Coldwater Fisheries and Wells



Note Well 4 is located just inside of an ACEC area indicated as “Not Defined”. Wells 1, 2, 3 and 5 are located outside of the ACEC designated areas. The wells are not located proximate to DFW Coldwater Fisheries.

Figure 5. Zone I and Zone II for Wells 1, 2, 3, 4 and 5

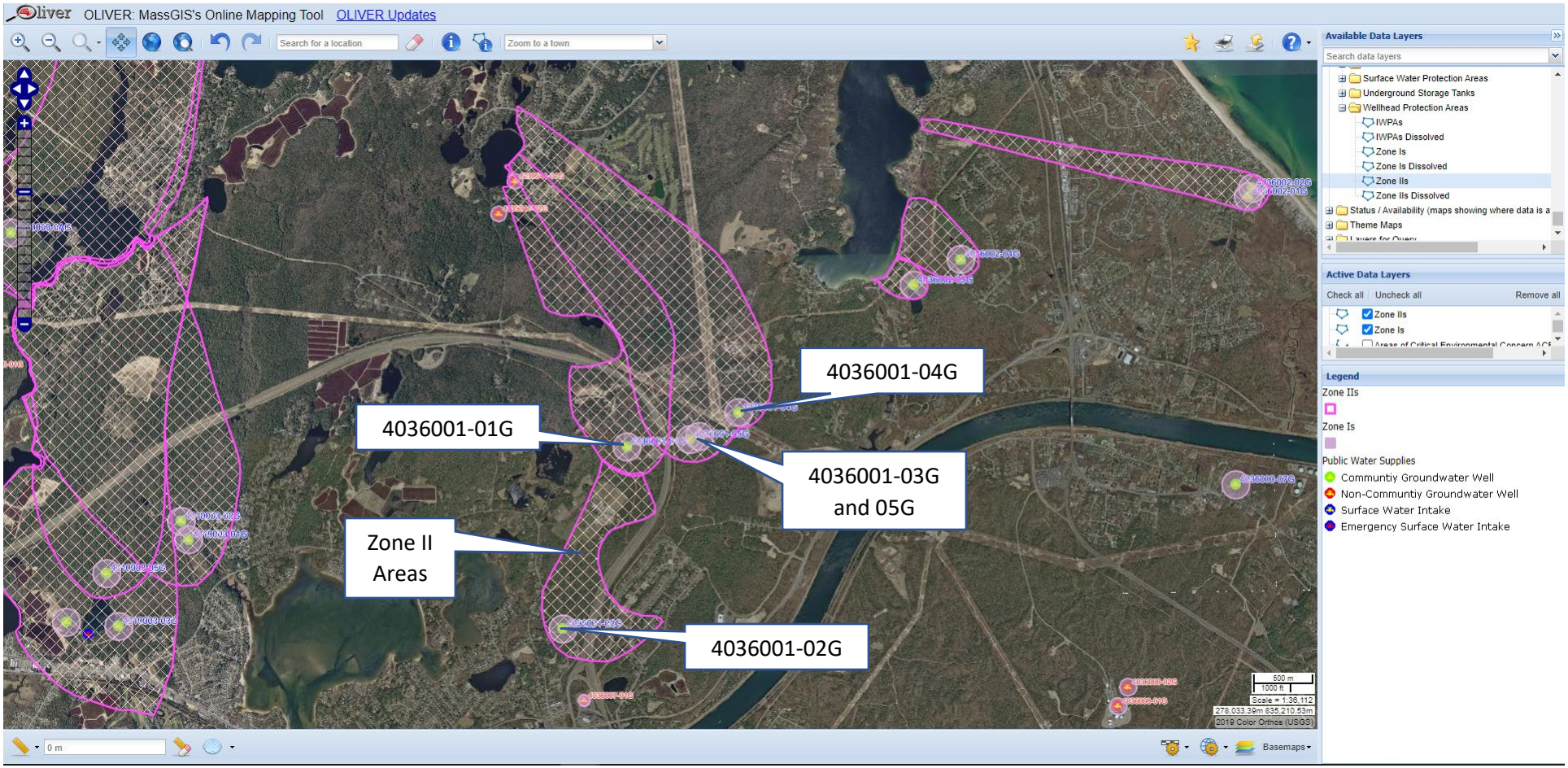


Figure 6. MassDEP Water Supply Protection Map

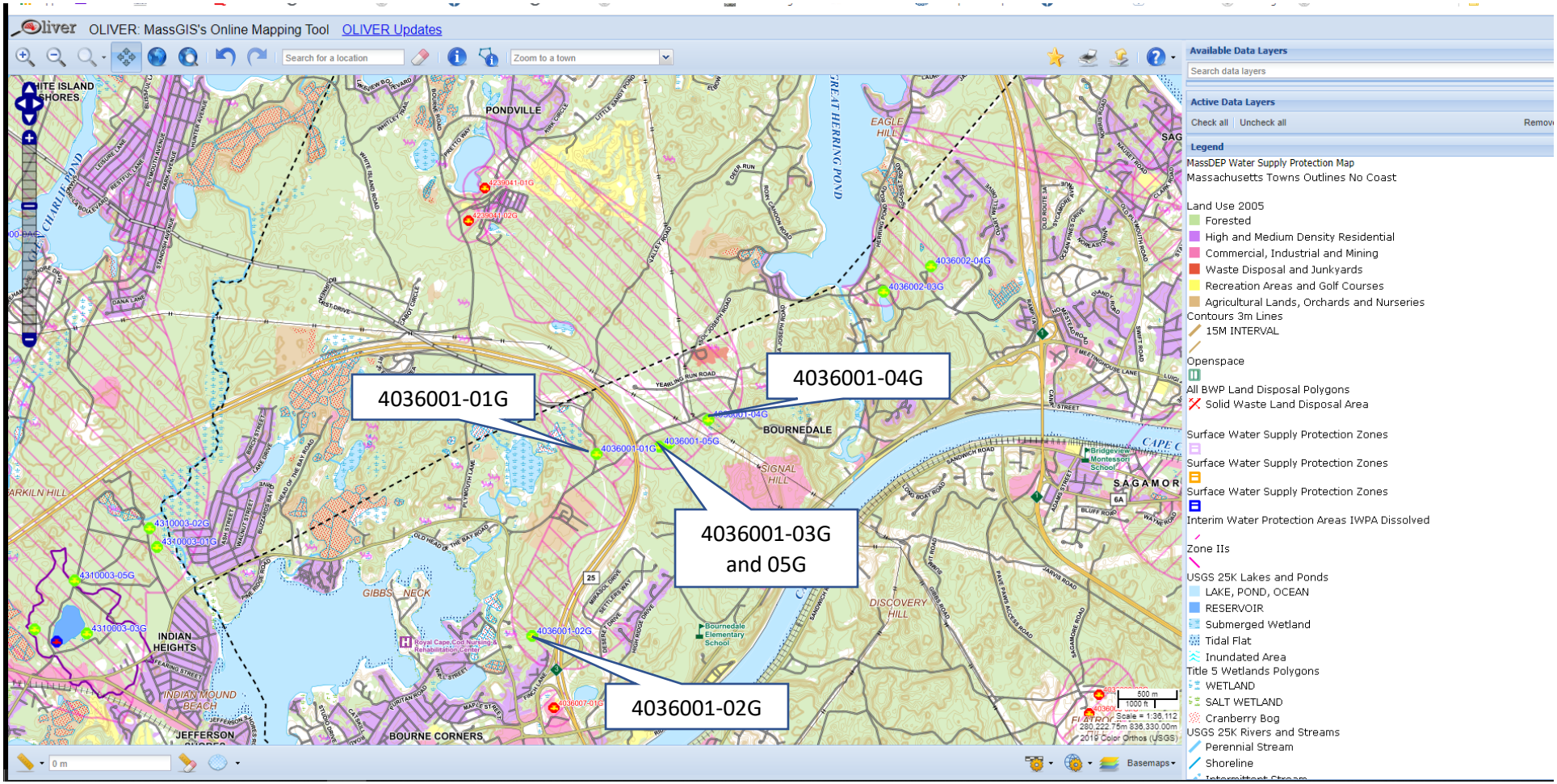
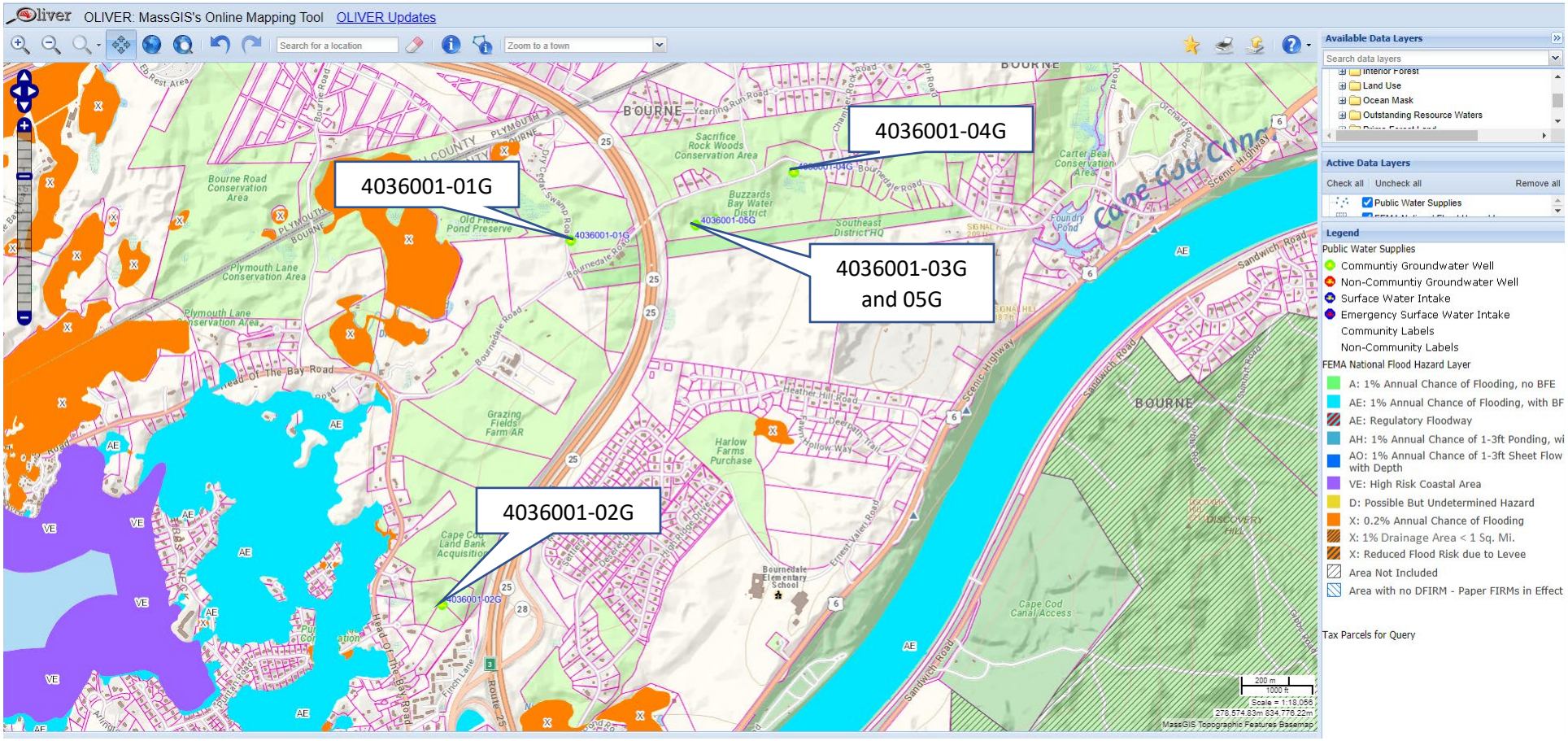


Figure 7. FEMA National Flood Hazard Layer and Wells



Note that the wells are located outside of the FEMA designated flood areas.

THE COMMONWEALTH OF MASSACHUSETTS

WATER RESOURCES COMMISSION

Water Conservation Questionnaire for Public Water Suppliers

Effective date: July 13, 2000
Revised: March 12, 2008

This questionnaire is based on the *Water Conservation Standards* for the Commonwealth of Massachusetts, which were approved by the Water Resources Commission (July 2006, or latest version; see Reference No. 10). The water conservation standards outline key components of a successful water conservation and demand management program, and are intended to assist communities and public water suppliers in protecting and maintaining their water supplies. Each section of this form corresponds to one of the standards, and begins with a statement of the standard, followed by a series of questions. As part of the water needs forecasting and Water Management Act permitting processes, technical staff in the Office of Water Resources (Department of Conservation and Recreation) and the Department of Environmental Protection will review this questionnaire to assess success in meeting the Water Conservation Standards and opportunities for improving water system efficiencies.

Who should complete this questionnaire?

- Public Water Suppliers applying for a Water Management Act permit, permit amendment or permit transfer from the Department of Environmental Protection
- Permittees undergoing a five-year review of their existing Water Management Act permit by the Department of Environmental Protection
- Public Water Suppliers requesting new or updated water needs forecasts from the Department of Conservation and Recreation, Office of Water Resources[1]
- Entities applying for Interbasin Transfer Approval with the Massachusetts Water Resources Commission
- Water suppliers interested in planning for demand management
- Water suppliers planning a new water source

When completing this form please note:

- See list of references at the end of this document.
- For specific information and background on the water conservation standards, see the latest version at http://www.mass.gov/envir/mwrc/pdf/Conservation_Standards.pdf (Reference No. 10).
- If necessary, expand responses beyond the space provided and/or reference or attach appropriate plans or responses.
- Projects requiring an Interbasin Transfer (IBT) approval are subject to specific water conservation performance standards that must be met prior to approval. IBT performance standards are available at http://www.mass.gov/dcr/waterSupply/intbasin/download.htm (Reference No. 13).

Questions? Contact:

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Department of Conservation and Recreation
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(617) 292-5706

[1] See *Policy for Developing Water Needs Forecasts for Public Water Suppliers and Communities and Methodology for Implementation*, December 13, 2007, at http://www.mass.gov/envir/mwrc/pdf/121307_waterneedsforcast.pdf

THE COMMONWEALTH OF MASSACHUSETTS
WATER RESOURCES COMMISSION

WATER CONSERVATION QUESTIONNAIRE

GENERAL INFORMATION ON THE PUBLIC WATER SUPPLY SYSTEM

Water Supplier: Buzzards Bay Water District PWS ID#: _____

Street Address: 15 Wallace Ave

City/Town: Buzzards Bay Zip Code: 02532

Contact Person: Steven Souza Title: Superintendent

Tel.: 508-759-4631 E-mail: ssouza@bbwd.us

1. Total volume of DEP Water Management-authorized water withdrawals (mgd):
   (a) Registered volume: 0.37 mgd
   (b) Permitted volume during each 5-year permit period:
   Volume 0.39 mgd From: 2020 To: 2024
   Volume 0.40 mgd From: 2025 To: 2029
   Volume 0.41 mgd From: 2030 To: 2034
   Volume 0.42 mgd From: 2035 To: 2039
   Total authorized withdrawal volume (a + b) for the current year: 0.76
   Permit expiration date (if applicable): Pending
2. If not registered or permitted, state total volume of water withdrawals (mgd) from the most recent Annual Statistical Report: _____
3. Is your Residential Gallons per Capita Day below 65?
   ☒ Yes ☐ No
   RGPCD reported on the most recent ASR (date: 2019) is 43 gallons per capita day.
4. Is your Unaccounted-for-Water below 10%?
   ☐ Yes ☒ No
   UAW reported on the most recent ASR (date: 2019) is 17 %.
5. Please attach a map of the municipalities served by your water supply system and outline the area served by your system.

Note: Citations and links can be found in the list of references at the end of this document.

STANDARD 1.0: COMPREHENSIVE PLANNING

Develop a written drought management plan that follows American Water Works Association drought management planning guidance (AWWA 2002 or latest version; Reference No. 2). Develop strategies appropriate to the system to reduce daily and seasonal peak demands and develop contingency plans to ameliorate the impacts of drought, seasonal shortages, and other non-emergency water supply shortfalls

Develop emergency management plans.

Develop a written water conservation program to comply with the Water Conservation Standards (July 2006 or latest version, Reference No. 10) and, where possible, with the recommendations outlined in that document, in the operation and management of the water supply. MassDEP Water Management permit conservation requirements are based on the state Water Conservation Standards.

Make the above documents readily available to personnel from all municipal departments to facilitate compliance and, if necessary, enforcement.

1. Do you have a Drought Management Plan that follows AWWA planning guidance (Reference No. 2)?

   ☒ Yes ☐ No

   If Yes, provide a copy of the cover, table of contents, and date of the plan: see attached.

   If No, do you have a schedule and timetable for developing a Drought Management Plan? _____

2. Do you have an Emergency Management Plan describing procedures for handling water emergencies?

   ☒ Yes ☐ No

   If Yes, provide a copy of the cover, table of contents, and date of the plan: see attached.

   If No, do you have a schedule and timetable for developing an Emergency Management Plan? _____

3. Do the plans include written procedures outlining which users will be cut back, what emergency measures will be implemented which trigger points require action, and how much will be cut back in the event of a water emergency or drought?

   ☒ Yes ☐ No

   If yes, please attach a summary or copy of the written procedures:

   Non-essential use at Massachusetts Maritime Academy will be reduced.

4. Do you have a written Conservation Program that meets the conditions of your Water Management Act permit (where applicable) or Massachusetts Water Conservation Standards (July 2006 or latest version, Reference No. 10)?

   ☒ Yes ☐ No

   What is the approximate cost per year of your conservation efforts, including personnel costs: $ 5,000

   What is the funding source(s) for these efforts? Annual O&M budget.

   If No, do you have a schedule and timetable for developing a written Conservation Program? _____

5. Are the above documents readily available to facilitate compliance and, if necessary, enforcement of restrictions in your plans?

☒ Yes ☐ No

STANDARD 2.0: SYSTEM WATER AUDITS AND LEAK DETECTION

Conduct a water audit on an annual basis using the MassDEP Water Audit Guidance Document (http://www.mass.gov/dep/water/approvals/wmgforms.htm#audit or latest version, Reference No. 9).

Conduct complete system-wide leak detection every two years (unless leakage constitutes a small portion of the system's unaccounted-for water; or the most current leak detection survey (conducted within the previous two years) indicates insignificant leakage (see Reference No. 3 for guidance).

Meet or demonstrate steady progress towards meeting 10% unaccounted-for water (UAW) as soon as practicable.

Conduct field surveys for leaks and repair programs in accordance with the AWWA Manual 36 (Reference No. 3 or latest version) and any MassDEP guidance documents (Reference No. 7 and other guidance documents available on DEP's web site, http://www.mass.gov/dep/water/laws/policies.htm#dwguid).

Repair all leaks found as expeditiously as possible. Establish a priority system to implement leak repairs. See specific guidance on timelines for repairing leaks in:

- MassDEP guidance (http://www.mass.gov/dep/water/approvals/wmgforms.htm#audit) (Reference Nos. 7 and 9)
- MWRA regulations, 360 CMR 12.09: Leak Repairs (Reference No. 16)
- MassDEP Water Management permits.

1. Do you conduct an annual water audit of your system?

☐ Yes. ☒ No

Water audit last performed by _____

Begin date: _____ End date: _____

Describe the tasks and results of your most recent audit (attach additional information if necessary):

_____

_____

_____

2. Do you conduct a full leak detection program for your distribution system every two years?

☒ Yes. ☐ No

If Yes, leak detection last performed by Sarian Co. on Ongoing

Please attach Table G3 from your 2007 ASR OR list summary results of that survey which includes: miles of main surveyed, # of leaks found, estimated water loss for each leak, date the leak was (or is scheduled to be) repaired. Attach additional information as necessary.

_____

_____

_____

If No, when was the last time you performed system-wide leak detection? _____

How often is a 100% leak detection survey of the distribution system completed? _____

_____

3. Estimate how much is spent on leak detection and repairs annually or per survey: $ 10,000 - 15,000 annually

- [x] Yes [ ] No Do you include leak detection/repair as an expense of the water system?
- [x] Yes [ ] No Do you have funds set aside for regular maintenance?
- [x] Yes [ ] No Do you have funds set aside for emergency repairs?

STANDARD 3.0: METERING

Ensure 100% metering of all water uses, including water use at all municipal facilities (schools, school athletic fields, etc.). Properly size the service lines and meters for all water distribution system users to meet AWWA performance standards (Reference No. 5).

Increase billing frequency. For domestic accounts, bill customers on actual, not estimated, meter readings. If billing frequency is less than quarterly (i.e. annual or biannual) move to quarterly billing as soon as possible.

Implement a water meter repair/replacement policy and program. Replace meters by size and time based on AWWA standards and guidelines (Reference Nos. 1 and 5) available on the MassDEP website (Reference No. 8 or latest version). Establish an annual budget line item for the calibration, replacement, and repair of all sources of supply and distribution network water metering systems.

Seal all water account metering systems against tampering and periodically inspect to ensure water works system integrity.

Calibrate any meter used to record quantity, according to its type and specification.

Properly size water service lines and meters to handle required water volumes and ensure a high level of metering accuracy.

Water Suppliers: Establish the necessary regulations and controls to **ensure that owners of large meters (1.5 inches or greater) calibrate the meters annually** and provide the results as part of an annual reporting requirement.

1. Is your system 100% metered?

   - [x] Yes [ ] No

   If No, what is not metered? _____

   What steps are you taking to complete metering of your system? _____

   _____

2. Do you use an automatic or radio-read meter reading system?

   - [x] Yes [ ] No

   If No, do you plan to install one?

   [ ] Yes [ ] No When? _____ Projected cost? _____

3. Are all public-sector facilities billed for their water use?

   - [x] Yes [ ] No

4. Are any accounts not billed?

   - [x] Yes [ ] No

   If Yes, what types of accounts are not billed? Water department

5. Do you bill based on actual meter readings, not estimated use?

☒ Yes ☐ No

If No, what steps are you taking to bill based on actual meter readings? _____

_____

6. Do you bill residential customers at least quarterly?

☐ Yes ☒ No Biannual

7. How often do you bill large users (1.5-inch meter or larger)?

☐ Annually ☐ Biannually

☒ Quarterly ☐ Monthly ☐ Other _____

8. Do the bills compare current use with use during the previous period?

☒ Yes ☐ No

9. Do the bills compare current use with use during the same period last year?

☐ Yes ☒ No

10. Is the volume of water used stated in gallons on the bill?

☒ Yes ☐ No

11. Do you have a meter repair/replacement program that services meters based on the AWWA standards (Reference Nos. 1 and 5)?

☐ Yes ☒ No Age only, accessible replacement program in place

12. Is your meter repair/replacement program funded through an annual budget appropriation?

☒ Yes ☐ No

If Yes, what is your annual budget for meter calibration, replacement, and repair?

$ 26,000 repair/replacement, $12,500 new, $600 calibration

Provide program details or attach policy/program or other supporting documentation: _____

See attached.

If No, what steps are you taking to improve and fund your meter repair/replacement program? _____

_____

13. Do you have the necessary regulations and controls to ensure that owners of large meters (1.5 inches or greater) calibrate the meters annually and provide the results as part of an annual reporting requirement.

☐ Yes ☒ No

14. How often do you calibrate your master meters (annually recommended)? Annually

STANDARD 4.0: PRICING

Use Full-Cost Pricing. Establish a water pricing structure that includes the full cost of operating, maintaining, and protecting the water supply system. Full-cost pricing factors all costs, including operations, maintenance, capital, and indirect costs (such as environmental impacts and watershed protection) into prices. Perform a rate evaluation every three to five years to adjust costs as needed.

Prohibit decreasing block rates. Decreasing block rates, which charge lower prices as water use increases during the billing period, are not allowed by M.G.L. Chapter 40, Section 39L.

1. Are water supply system operations fully funded by water supply system revenues?

   ☒ Yes ☐ No

2. Is this an Enterprise Account?

   ☐ Yes ☒ No (District is separate from Town)

3. When was your most recent rate evaluation? July 2017

4. Which of the following items are covered by the price of water charged to customers?

a. ☐	Watershed purchase/protection	l. ☐	Emergency repairs
b. ☐	Well site purchase/protection	m. ☐	Capital depreciation account
c. ☐	Aquifer land acquisition	n. ☐	Capital replacement/depreciation fund
d. ☐	Distribution system operation	o. ☐	Debt service
e. ☐	Leak detection	p. ☐	Staff training/professional development
f. ☐	Pumping	q. ☐	Staff benefits package
g. ☐	Maintenance	r. ☐	Hiring of staff
h. ☐	Treatment and associated treatment plant costs	s. ☐	Purchase/installation of water conservation devices
i. ☐	Leak repairs	t. ☐	Water conservation program, including staff
j. ☐	Meter repair and replacement	u. ☐	All aspects of the education program
k. ☐	Electricity/fuel	v. ☒	All of the above

5. Please check the type of rate structure(s) your system uses:

   ☒ Increasing block rate ☐ Flat rate

   ☐ Seasonal rate ☐ (Other rate (please explain) _____

   Describe or attach a copy of your current pricing levels(s) for water and sewer:

WATER		SEWER	
Amount per	Volume	Amount per	Volume
$ 81.00	Base charge each bill	$	
$ 3.00 per 1,000 gal	1-15,000 gal.	$	
$ 5.53 per 1,000 gal	16,000-40,000 gal.	$	
$ 7.00 per 1,000 gal	over 40,000 gal.	$	

☐ Decreasing block rate

Decreasing block rates are prohibited by law. What steps are you taking to revise your rate structure?

6. Is your rate structure regularly evaluated?

☒ Yes ☐ No

How often? Annually

When was your rate structure last changed? FY 18 rates last changed and will again in FY 22

7. Was your rate structure developed to promote water conservation and/or control demand (that is, do you charge more for water when demand is higher – for example, in the summer)?

☒ Yes ☐ No

If Yes, describe its effectiveness The rates were established to promote conservation by having an increasing tier, when usage increases in the summer, customers that use more water are charged a higher tier in accordance with higher usage.

8. Do any of your customers have a second meter for outdoor water use?

☒ Yes ☐ No

If Yes, do you have a different rate structure for these meters?

☐ Yes ☒ No

If Yes, describe this rate structure

(Note: rate structures that encourage reduction of nonessential outdoor water use are preferable. See *Water Conservation Standards* (Reference No. 10, Sec. 4.0) Pricing Recommendations.)

STANDARD 5.0: RESIDENTIAL WATER USE

Install Water-Efficient Plumbing Fixtures. Meet the standards set forth in the Federal Energy Policy Act, 1992 (Reference No. 12 or most recent version) and the latest version of the Massachusetts Plumbing Code (Reference No. 15). Provide and/or promote toilet leak detection kits or services, and educational literature about installation of water-saving devices and water conservation savings (in gallons and dollars) in retrofit programs.

Use Residential Water Efficiently. Meet or demonstrate steady progress toward meeting residential water use of 65 gallons per capita per day (gpcd), including both indoor and outdoor use, as soon as practicable.

Implement a comprehensive residential water conservation program that seeks to reduce residential water use by implementing some or all of the applicable recommendations listed in Sections 5.0 and 9.0 of the *Water Conservation Standards* (Reference No. 10).

1. Do you provide educational literature about installation of water-saving devices and water conservation savings (in gallons and dollars)?

☒ Yes ☐ No

2. Do you provide retrofit or rebate services to your customers?

☐ Yes ☒ No

What does your program include?

☐ Toilet retrofit ☐ Toilet replacement rebates ☐ Faucet aerators retrofit ☐ Low-flow showerheads

☐ Clothes Washer rebates ☐ Dishwasher rebates ☐ Other

If Yes, describe your program for assisting residential customers in converting to more efficient plumbing fixtures:

If No, and your system's residential water use exceeds 65 gpcd, describe any plans for implementation of such a residential retrofit or rebate program. (See Ref. No. 10, Sections 5.0 and 9.0.) The plan should include dates for implementation and the expected cost per year of the program:

Residential water use does not exceed 65 gpcd.

STANDARD 6.0: PUBLIC SECTOR WATER USE

For all municipal and state buildings:

- Conduct indoor and outdoor audits and account for full use of water, based on full metering of public buildings, parks, irrigated playing fields, and other facilities.
- Analyze existing water-use data to spot trends, patterns, and unexplained increases that could indicate leaks or inefficient use of water.
- Identify measures where the greatest efficiencies and potential savings can be realized.
- In addition to complying with the plumbing code (Reference No. 15), build new public buildings with equipment that reduces water use. Water-saving devices and measures should be well identified to users of public buildings and facilities.
- Focus on replacing/retrofitting water-consuming equipment in buildings (e.g., bathrooms, boilers, chillers).
- Practice efficient lawn and landscape water-use techniques and meet the standards described in Section 9.0 of the *Water Conservation Standards* (Reference No. 10).

Meter or estimate use of water from fire hydrants for pipe flushing, construction, and other uses not related to fire fighting.

Strictly apply plumbing codes and incorporate other conservation measures in new and renovated buildings.

1. Does your water supply system provide assistance to your public-sector users in conducting water-use audits?

   ☒ Yes ☐ No

   If Yes, describe how you provide assistance: How to read meters, look for leaks, provide literature and supplies.

2. Have water-saving devices been installed in all public buildings?

   ☐ Yes ☒ No

   If No, describe in detail a plan and schedule for installing such devices including the dates proposed for each facility. Attach additional sheets if necessary.

   Bourne Town Hall, fire station, Bourne Veteran's Memorial Community Center and Bourne Middle School, New Police Station and New DPW are equipped with water saving devices. Remaining buildings are cost prohibitive to retrofit.

3. Do you meter water from hydrants used by contractors for pipe flushing and/or construction?

   ☒ Yes ☐ No

   Do you bill for hydrant use?

   ☒ Yes ☐ No

4. Do you inspect, or coordinate with your municipality's building inspector, to ensure the plumbing codes are strictly applied in new and renovated buildings?

☐ Yes ☒ No

STANDARD 7.0: INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL (ICI) WATER USE

Carry out a water audit to determine the location and amount of water used for heating, cooling, processing, sanitary use, and outdoor use. Use the findings from the audit as the basis for actions to conserve water.[2]

Significant users (i.e., those using greater than 50,000 gpd) **install separate meters for process water** so that water can be accounted for and appreciated as a raw material in production, and for sanitary use.

Develop and implement a water-savings strategy, addressing, among other items, demand management, leak detection and repair, a program of preventive maintenance, and a program of employee education.

In new and renovated buildings, **comply with plumbing codes, use the best available technologies for water conservation, and reuse treated wastewater** within the facility to the extent possible.

Practice good lawn and landscape water-use techniques and meet the standards described in Section 9.0 of the *Water Conservation Standards* (Reference No. 10).

1. Does your water supply system assist ICI users in complying with the standards (above) of Section 7.0, Industrial, Commercial, and Institutional (ICI) water use?

☐ Yes ☒ No

If Yes, describe how you provide assistance _____

If No, what steps are you taking to provide assistance in the future? _____

STANDARD 8.0: AGRICULTURAL WATER USE

As part of the management of an agricultural operation, adopt a water conservation approach through which water is used in a planned and efficient manner with appropriate amounts and frequency to meet needs without excessive water loss.

1. Does your water supply system provide water to significant agricultural users?

☒ Yes ☐ No

If Yes, do you have a program to assist agricultural users in conserving water? _____
This customer receives the same conservation materials as all customers.

[2] See Appendix H of the *Water Conservation Standards* (Reference No. 10) for sample ICI water audit.

STANDARD 9.0: LAWN AND LANDSCAPE

Minimize watering of lawns or landscapes, especially in water-short communities and where the water source is in a stressed basin or sub-basin.

Develop and implement seasonal demand management plans as part of the drought management plan. These plans must identify water supply and environmental indicators (such as streamflow triggers) to serve as water-use restriction triggers and outline a set of increasingly stringent and effective water-use restrictions that are designed to protect public health and the environment.

Adopt and implement (as appropriate) a water-use-restriction bylaw, ordinance or regulation, which applies to both municipal and private wells.[3]

Fully enforce water-use restrictions. Empower authorities to issue warnings to first-time offenders and citations to repeat offenders

1. Do you assist those responsible for maintenance of municipal parks and athletic fields to minimize water use?

   ☒ Yes ☐ No

   If Yes, provide details. Communicated with Town on responsible irrigation practices to minimize water use and to reduce the hours of the splash pad operation and not to open the splash pad in the rain or irrigate when raining.

2. Do you have a written Seasonal Demand Management Plan?

   ☐ Yes ☒ No

   If Yes, when was the plan approved? _____

   Please provide either a copy of the plan, or a copy of the cover, table of contents and date of the plan.

3. Does the municipality served by your water system have a water-use-restriction bylaw, ordinance, or regulation?

   ☐ Yes ☒ No

   If Yes, when was the bylaw, ordinance, or regulation adopted? _____

   When was the bylaw, ordinance, or regulation last implemented? From: _____ To: _____

4. Please check type of restrictions:

   ☐ ban on all non-essential outdoor water use
   ☐ hand-held hose only
   ☐ one day per week only
   ☐ two days per week only
   ☐ odd/even day wateringly only
   ☐ restricted hours (provide details): _____
   ☒ other (provide details): Voluntary

5. Are your water-use restrictions triggered by:

   ☒ the calendar (e.g., May 1 – September 30 each year)
   ☐ Streamflow measured at a stream gage
   ☐ Drought Advisory declared by the Massachusetts Drought Task Force
   ☐ other (provide details): _____

6. Do you fully enforce water use restrictions?

   ☐ Yes ☒ No

[3] See Appendix B of the *Water Conservation Standards* (Reference No. 10) for model water use restriction bylaws.

7. Do you have a bylaw or ordinance that restricts installation or operation of automatic sprinkler systems (for example, requiring a controller that prevents system operation during rainfall)?

   ☐ Yes ☒ No

   If Yes, describe restriction _____

8. Do you have a bylaw or ordinance regulating the use of private wells for outdoor water use, particularly for landscape irrigation?

   ☐ Yes ☒ No

9. Do you have a conservation outreach program for private well owners?

   ☐ Yes ☒ No

STANDARD 10.0: PUBLIC EDUCATION AND OUTREACH

Develop and implement an education plan, which includes most, if not all, items listed in the *Water Conservation Standards*, page 29 (Reference no. 10).

Provide education and outreach to self-supplied water users (e.g., home or businesses on their own private wells) on their responsibility to conserve water.

1. Do you have a public education plan?

   ☒ Yes ☐ No

   If Yes, check which items are included in your outreach program.

   ☐ Targeted outreach to the largest water users
   ☒ Bill stuffers. How often mailed? Twice per year.

   Does your program include:

   ☐ Information enabling customers to calculate their water use and compare it to the standard of 65 gpcd
   ☒ Usage history
   ☐ Free water audits
   ☐ Rebates on water-efficient plumbing fixtures and appliances
   ☒ Information on water-wise landscaping, gardening, efficient irrigation, and lawn care practices
   ☐ Targeted outreach to industrial, commercial, and institutional users
   ☐ Water conservation curriculum for schools
   ☐ Water conservation workshops for the general public
   ☐ Special events, such as Conservation Fairs, contests, and recognition programs
   ☐ Speakers for community organizations
   ☒ Water conservation information center
   ☐ Public service announcements or announcements in other media
   ☐ Multilingual materials
   ☐ Education and outreach to self-supplied users (i.e., home or businesses on their own private wells)

   What public outreach and education efforts have you found most effective and why? _____

   _____

   _____

   _____

If No, what steps are you taking to develop a public education program? _____

_____

_____

_____

Certification:

I certify, under penalty of law, that the responses provided and all attachments were prepared under my supervision, in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: _____ Date: 10/7/2020

Title: Superintendent, Buzzards Bay Water District

Drought Management Plan
Buzzards Bay Water District

While severe droughts can result in dire emergency situations, they are generally slow developing and therefore provide the opportunity to take actions to minimize their impacts on water supplies and the environment.

Drought Indicators and Triggers
Drought indicators are used to assess the status of water supplies and the status of the impact of water withdrawals on the environment. Buzzards Bay Water District will follow the drought level indices identified by Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency in the *Massachusetts Drought Management Plan* (May 2013) as reported for the Cape Cod & Islands drought region. See the attached table of drought indices and refer to the report for further information.

Emergency Response Plan
Buzzards Bay Water District Water System Emergency Response Plan was developed to provide specific procedures for various levels of emergency, include lists of key phone numbers and contact information for local, state and federal emergency response officials. The Emergency Response Plan should be consulted for drought management and other water system emergencies.

Emergency Water Connections and Water Supply
Buzzards Bay Water District does not have alternate raw water sources. Buzzards Bay Water District has identified three systems as potential emergency interconnections: North Sagamore Water District, Bourne Water District, and the Onset Fire District. Due to distance, interconnections with North Sagamore Water District and Bourne Water District are currently unrealistic. There are two possible locations for an interconnection with the Onset Fire District. Although Onset Fire District appears to have the capacity to serve Buzzards Bay, Onset lacks the hydraulic capacity to serve the system.

For short term water loss, the following supply options exist:

- Local supermarkets
- Buzzards Bay Water District's Standpipe
- Buzzards Bay Water District's Hydropillar
- Draw Station at Bourne Veteran's Memorial Community Center
- Bulk delivery of water

MassDEP provides procedures for the bulk delivery of water, which is regulated by the Massachusetts Department of Public Health, Food Protection Program. "Procedures for Emergency Tank Truck Bulk Water Huling" can be found online at: http://www.mass.gov/eea/docs/dep/water/drinking/alpha/a-thru-h/blkwfct.pdf or in the Emergency Response Plan along with a list of suppliers.

For further information, consult the *Buzzards Bay Water District Water System Emergency Response Plan:*

- Section III item F. Identification of Alternate Water Sources
- Appendix 1H Emergency Bulk Water and Tanker Information
- Action Plan 6 – Water supply Interruption

Water Use Restrictions

In 2012 Buzzards Bay Water District established a voluntary Outdoor Water Conservation Program. The details are as follows:

- The program is effective June first through September first
- Voluntary non-essential water use
- Customers with even numbered properties may water on even numbered days
- Customers with odd numbered properties may water on odd numbered days
- Watering is allowed before 9 am and after 5 pm
- During dry or very hot periods customers are encouraged to water by hand held hose only

This information can be found on Buzzards Bay Water District's website:
http://buzzardsbaywaterdistrict.us/conservation.html

In the event of a water emergency or a drought, non-essential water use at Massachusetts Maritime Academy will be cut back.

Presently, Buzzards Bay Water District is developing an enforceable by-law regarding non-essential outdoor water use to be considered by the Board of Water Commissioners. This restriction would be implemented under a drought condition.

Table 3. Drought Indices

Drought Level	Standardized Precipitation Index	Crop Moisture Index*	Keetch-Byram Drought Index*	Precipitation	Groundwater	Streamflow	Reservoir***
Normal	3-month > -1.5 **or** 6-month > -1.0 **or** 12-month > -1.0	0.0 to -1.0 slightly dry	< 200	1 month below normal	2 consecutive months below normal**	1 month below normal**	Reservoir levels at or near normal for the time of year
Advisory	3-month = -1.5 to -2.0 **or** 6-month = -1.0 to -1.5 **or** 12-month = -1.0 to –1.5	-1.0 to -1.9 abnormally dry	200-400	2 month cumulative below 65% of normal	3 consecutive months below normal**	At least 2 out of 3 consecutive months below normal**	Small index Reservoirs below normal
Watch	3-month < -2.0 **or** 6-month = -1.5 to -3.0 **or** 12-month = -1.5 to -2.0	-2.0 to –2.9 excessively dry	400-600	1 of the following criteria met: 3 month cum. < 65% **or** 6 month cum. < 70% **or** 12 month cum. < 70%	4-5 consecutive months below normal**	At least 4 out of 5 consecutive months below normal**	Medium index Reservoirs below normal
Warning	6-month < -3.0 **or** 12-month = -2.0 to -2.5	< -2.9 severely dry	600-800	1 of the following criteria met: 3 month cum. < 65% and 6 month cum. <65%, **or** 6 month cum. <65% and 12 month cum. <65%, **or** 3 month cum. <65% and 12 month cum. <65%	6-7 consecutive months below normal**	At least 6 out of 7 consecutive months below normal**	Large index reservoirs below normal
Emergency	12-month < -2.5	<-2.9 severely dry	600-800	Same criteria as Warning and previous month was Warning or Emergency	>8 months below normal**	>7 months below normal**	Continuation of previous month's conditions

* The Crop Moisture Index is subject to frequent change. The drought level for this indicator is determined based on the repeated or extended occurrence at a given level.

** Below normal for groundwater and streamflow are defined as being within the lowest 25th percentile of the period of record.

*** Water suppliers should be consulted to determine if below normal reservoir conditions are due to operational issues.

Buzzards Bay Water District

Water System Emergency Response Plan

December 2009

Copy __ of 4

CONFIDENTIAL

Last Updated _____

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Massachusetts Department of Environmental Protection
Bureau of Water Resources (BWR) – Drinking Water Program
Public Water Supply Annual Statistical Report
Reporting Year 2019

PWSID#: 4036001
Name: BUZZARDS BAY WATER DISTRICT
City: BOURNE
PWS Class: COM

Water Management Act Annual Report - Distribution

All public water suppliers distributing 100,000 gallons per day or more must complete Tables DS-1 through DS-5 and Tables DS-7 and DS-8. Tables DS-6 and DS-9 are optional. Instructions for completing Tables DS-1 through DS-8 are included in the ASR Instructions available at MassDEP's website. If you have any questions concerning completion of the Distribution System Report, please contact Duane LeVangie with the WMA Program at (617) 292-5706 or email him at duane.levangie@mass.gov

Table DS-1 Summary of Leak Detection Activities During the Reporting Year	
1. Total miles of water mains	53
2. Miles of mains surveyed this year	5.45
3. Number of leaks found	0
4. Number of leaks repaired	0
5. Estimated volume lost (mg) if a reliable estimate can be made	0
6. Date of last leak detection survey of entire system:	12/12/2015 (mm/dd/yyyy)

Table DS-2 Water Conservation - Limits on Withdrawals

1. **Did your PWS implement mandatory nonessential outdoor water use restrictions in the reporting year?**
   ( ) Yes (•) No

2. **If yes,why did you institute mandatory restrictions (check all that apply)?**

a. [ ] Required by WMA permit

   [ ] Calendar trigger in permit
   [ ] Streamflow trigger in permit
   [ ] Other trigger in permit If "Other Trigger" then describe:

b. [ ] Reason other than permit requirement
   Describe:

3. **Please characterize the type of mandatory restrictions that were in place (Check all that apply)**

   [ ] Total outdoor ban

   [ ] Hand-held only
   [ ] Hourly Describe:

   Daily: ( ) Odd/Even ( ) Twice/Week ( ) Once/Week ( ) Other Daily If "Other Daily" then describe:

Meter Program

The Buzzards Bay Water District annually budgets for the repair, replacement and calibration of its meters. In addition to funding its water program and operation and maintenance budget, the District routinely supplements this with articles. New meters are installed by in-house staff. An outside contractor is used for annual master meter calibration.

Water Conservation and Public Outreach Program

In 2012 Buzzards Bay Water District established a voluntary Outdoor Water Conservation Program. The details are as follows:

- The program is effective June first through September first
- Voluntary non-essential water use
- Customers with even numbered properties may water on even numbered days
- Customers with odd numbered properties may water on odd numbered days
- Watering is allowed before 9 am and after 5 pm
- During dry or very hot periods customers are encouraged to water by hand held hose only

This information can be found on Buzzards Bay Water District's website:
http://buzzardsbaywaterdistrict.us/conservation.html

Buzzards Bay Water District makes water conservation tips and educational materials available to the public on their website, to customers who visit the District office, and to users through the billing process. This information includes but is not limited to:

- links to other water conservation and education websites
- recommendations for water use
    - Outdoor
    - Kitchen
    - Bathroom
    - Laundry

BUZZARDS BAY WATER DISTRICT

WELCOME TO THE
BUZZARDS BAY WATER DISTRICT

The Buzzard Bay Water District strives to provide the necessary technical, financial, and managerial services to maintain sustainability and to operate in compliance with provisions of the Federal Safe Drinking Water Act. Our goal is to provide exemplary customer service while delivering high quality water to the businesses and residents of Buzzards Bay and South Plymouth. We are committed to providing an affordable and dependable drinking water supply that meets all State and Federal Standards. In addition, we work to maintain an ample fire safety supply to offer dependable fire protection.

2019 Consumer Confidence Report

Check us out on Facebook

NEWS and EVENTS

Regular meeting of Commissioners to be held Sept 9+10, 2020 @ 4:45 pm

COVID-19 IMPORTANT INFO
Buzzards Bay Water District office is currently closed to the public. Payments can still be made online and by mail. For emergencies, please call the office at 508-759-4631 or page us at 508-387-2748.

VOLUNTARY WATER RESTRICTIONS: The District is asking all customers to observe VOLUNTARY water restrictions on outside watering. Odd address numbers can water on odd dates and even address numbers can water on even dates. Thank you for your cooperation!

CONTACT US

PO Box 243
15 Wallace Avenue
Buzzards Bay, MA 02532
508.759.4631
508.759.1408
lwarren@bbwd.us

New Remittance Address for Payments:

Buzzards Bay Water District
PO Box 1075
Medford MA 02155-0011

LOCAL WATER NEWS

ONLINE BILL PAY AVAILABLE!

Payment Options: You have two (2) options for paying your bill online; either by electronic check or credit card. We accept MasterCard, Discover, and American Express for credit card payments. We are no longer able to accept VISA.

There will be a convenience fee for each online payment. The credit card service provider charges the fee to your credit card. When paying by credit card, the fee amount will appear in a separate box and will be totaled with the amount of the bill.

PLEASE NOTE: there is a 2.95% fee to use a credit card and a .50 fee to pay by electronic check.

Click on the link below:

https://epay.cityhallsystems.com?key=buzzardsbay.ma.us

Imagine a Day Without Water

No drinking water.
No coffee.
No shower.
No laundry.
No toilet flushing.
No hospitals.
No firefighting.
No agriculture.
No crops.
No livestock.
NO LIFE.

Buzzards Bay Water District

Main Office
15 Wallace Ave | PO Box 243
Buzzards Bay, MA 02532
P 508.759.4631 | F 508.759.1866
lwarren@bbwd.us
www.buzzardsbaywaterdistrict.com

Main Office Hours
M-F: 7:30am-4:00pm
(excluding holidays)

Driving Directions

From Bourne Bridge/Rt. 25: Enter onto the Buzzards Bay Rotary. Take second exit off the rotary, onto Main Street, Buzzards Bay. Continue down Main Street for approximately 1 mile. Turn Right onto Wallace Avenue. Continue straight through the stop sign and our building is located straight ahead. We are a small white building with a flag pole out front.

Buzzards Bay Water District

The Value of Water

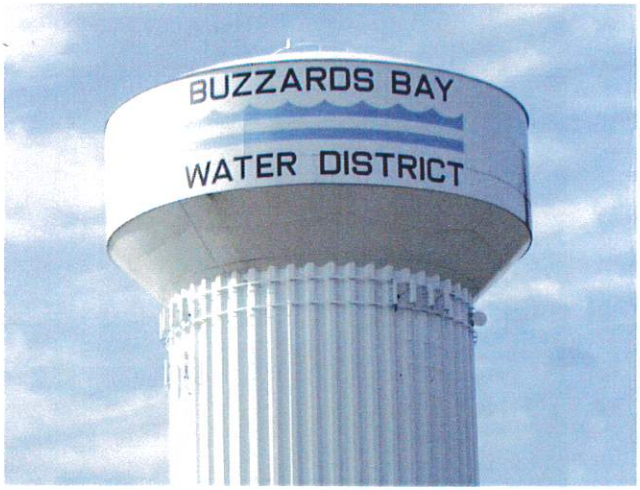
www.buzzardsbaywaterdistrict.com

THE VALUE OF WATER

UTILITY COST COMPARISON

Utility	Avg. Monthly Cost	Avg. Annual Cost
Electric[1]	$119	$1,431
Cable/Internet[2]	$220	$2,640
Cell Phone[2]	$65	$780
Water[3]	$26	$307

1 U.S. Energy Information Administration (EIA) for MA
2 Buzzards Bay Customer
3 Based on Average Customer Usage of 51 RGPCD from 2015 ASR and 2.14 people per household from 2010-2017 US Census



OUR MISSION:

The Buzzards Bay Water District strives to provide the necessary technical, financial, and managerial abilities to maintian sustainability and to operate in compliance with provisions of the Federal Safe Drinking Water Act. Our goal is to provide exemplary customer service. We are committed to providing an afforadable and dependable drinking water supply that protects public health which meets all of the State and Federal Standards for quality and quantity to all of its consumers, while maintaining an ample fire supply system that supports public safety.

Buzzards Bay Water District New Water Rates

Year	FY18*	FY19	FY20	FY21	FY22
Base Charge	$81.00	$81.00	$81.00	$81.00	$85.05
Tiered Rate Per 1,000 Gallons					
Up to 15,000 Gallons	$3.00	$3.00	$3.00	$3.00	$3.15
15,001 - 40,000 Gallons	$5.53	$5.53	$5.53	$5.53	$5.81
Greater than 40,001 Gallons	$7.00	$7.00	$7.00	$7.00	$7.35

**New rates for customers with semi-annual billing will be reflected on the January 2018 bills.*
**New rates for customers with quarterly billing will be reflected on the October 2017 bills.*

Why Choose Tap Over Bottled Water?

COST

For the price of one bottle of designer water, you can fill up the same size bottle from the tap once a day, every day — for 13 years. To drink the recommended eight 8-ounce glasses of tap water per day costs about 50¢ annually. The same amount of bottled water costs $1,400!

PURITY

Tap water is highly regulated. It is regularly checked for traces of E. coli and fecal coliform bacteria. The FDA doesn't hold the same rules for bottled water. Tap water must be tested for coliform bacteria 20 or more times a month. Bottled water companies are only required to test once a week. Bottled water doesn't have to list the source, purification methods, or chemical pollutants on the bottle, so there's no telling what you may be drinking.

STEWARDSHIP

The United States requires $3-$5 trillion over the next 20 years to improve its aging water and sewer infrastructure. Drinking tap water keeps your water dollars local so that your community can fund necessary water improvement projects as well as other important water quality initiatives.

ENVIRONMENT

Over 35 billion water bottles are dumped in U.S. landfills annually, and each of these water bottles will take over 700 years to decompose. Also, 36 ounces of water is needed to produce one 12-ounce plastic bottle, bottling water produces 2.5 million tons of carbon dioxide every year, and 17 million barrels of oil are used in the production of a year's worth of plastic water bottles – that's enough to fuel one million cars for a full year.

www.buzzardsbaywaterdistrict.com