Client: TEC, Bob Niccoli, P.E., S.E
Hancock Project #: 26397
Address: 183 Chestnut Street, North Reading
Date: August 24th, 2022

Bordering Vegetated Wetland (BVW) and MAHW associated with a mapped USGS perennial stream (Ipswich River) were field delineation by a Wetland Professional in Training Scientist (WPIT®) on August 16th, 2022, in accordance with MassDEP wetland delineation standards.

Bordering Vegetated Wetlands (BVW)

In accordance with the MA WPA implementing regulations set forth under 310 CMR 10.55 and the utilization of the methodology described within (1) "BVW: Bordering Vegetated Wetlands Delineation Criteria and Methodology," issued March 1, 1995; and (2) "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A handbook," produced by the Massachusetts Department of Environmental Protection, date March 1995., Hancock Associates staff delineated the following Bordering Vegetated Wetlands (BVW), which are defined under 310 CMR 10.55(2)(a) as, "freshwater wetlands which border on creeks, rivers, streams, ponds, and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps, and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants". The limit of BVW is further defined as "the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist. Wetland indicator plants shall include but not necessarily be limited to those plant species identified in the Act. Wetland indicator plants are also those classified in the indicator categories of Facultative, Facultative+, Facultative Wetland-, Facultative Wetland, Facultative Wetland+, or Obligate Wetland in the National List of Plant Species That Occur in Wetlands: Massachusetts (Fish & Wildlife Services, U.S. Department of the Interior, 1988) or Plants Exhibiting Physiological or Morphological Adaptations to Life in the Saturated or Inundated Conditions"

BVW was delineated to the extent that it would broadcast associated buffer zone toward the limits of proposed work on the property. The delineation was based on observations of where vegetative species composition transitions from dominance of wetland indicator species, to dominance of upland indicator species. Other notable characteristics were the presence of a perennial stream that had flow within the BVW complex and saturated, mucky peat hydric soils.

BVW was delineated with two (2) flag series, identified as Series A and Series B as follows:

A-series Wetland

The A series wetland is a BVW located south, adjacent to the existing Chestnut Street roadway starting southeast and heading west, which broadcasts associated buffer zones and setback zones in accordance with the North Reading Wetlands Bylaw/Ordinance. The limit of BVW associated with the A-100 series wetland was demarcated with a single series of ten (10) wetland flags labeled A (100 through 109E) and the A-200-series was demarcated with five (5) wetland flags on the opposite site of Ipswich Riverbank

labeled A (200 through 204E). A data plot was taken and recorded at WFA102 associated with the Wetland Plot 2 provided to TEC.

B-Series Wetland

The B series wetland is a BVW starting at the edge of Chestnut Street and runs west, parallel to the A-series wetland, which broadcasts associated buffer zones and setback zones in accordance with the North Reading Bylaw/Ordinance. The limit of BVW associated with the B-100 series wetland was demarcated with a single series of six (6) wetland flags labeled B (100 through 105E) and the B-200 series wetland was demarcated with a single series of nine (9) wetland flags labeled B (197 through 205E). The B-200 series wetland is just northwest of Ipswich River and meets Mean Annual High Water (MAHW) flag 402E. A data plot was taken and recorded at WFB101 associated with the Wetland Plot 1 provided to TEC.

Riverfront (310 CMR 10.58)

In accordance with the MA WPA implementing regulations set forth under 310 CMR 10.58 and the utilization of the methodology described within (1) "BVW: Bordering Vegetated Wetlands Delineation Criteria and Methodology," issued March 1, 1995; and (2) "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A handbook," produced by the Massachusetts Department of Environmental Protection, date March 1995., Hancock Associates staff delineated the following Riverfront which are defined under 310 CMR 10.58(2)(a) as "*Riverfront Area is the area of land between a river's mean annual high water line and a parallel line measured horizontally. The riverfront area may include or overlap other resource areas or their buffer zones. The riverfront area does not have a buffer zone."* Because this existing Riverfront flows through to a pond, "*the Riverfront Area stops at the inlet and begins again at the outlet. A water body identified as a lake, pond, or reservoir on the current USGS. map or more recent map provided by the Department, is a lake or pond, unless the issuing authority determines that the water body has primarily riverine characteristics. When a water body is not identified as a lake, pond, or reservoir on the current USGS. map or more recent map provided by the Department, the water body is a river if it has primarily riverine characteristics. Riverine characteristics may include, but are not limited to, unidirectional flow that can be visually observed or measured in the field. In addition, rivers are characterized by horizontal zonation as opposed to the vertical stratification that is typically associated with lakes and ponds. Great Ponds (i.e., any pond which contained more than ten acres in its natural state, as calculated based on the surface area of lands lying below the natural high-water mark; a list is available from the Department) are never rivers.*

The Riverfront Area is the area of land between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away in North Reading, Massachusetts.

MAHW was delineated to the extent that it would broadcast associated 200-foot riverfront area toward the limits of proposed work on the property. The delineation was based on observations of hydrology and where vegetative species composition transitions from dominance of wetland indicator species, to dominance of upland indicator species.

MAHW was delineated with four (4) flag series, identified as, 100-Series, 200-Series, 300-Series, and 400-Series as follows:

MAHW 100 Series

The 100-series, runs southwest of Chestnut Street. This delineation is also associated with the existing USGS Mapped Perennial stream (Ipswich River), which broadcasts associated buffer zones and setback zones in accordance with the MA WPA, Riverfront Area (10.58), and North Reading Bylaw/Ordinance. The limit of MAHW associated with the existing perennial stream located on the northeast side of Middleton Road was demarcated with a single series of four (4) flags labeled MAHW (100 through 103E).

MAHW 200 Series

The 200-series runs parallel to the 100-series just northwest. This delineation is also associated with the existing USGS Mapped Perennial stream (Ipswich River), which broadcasts associated buffer zones and setback zones in accordance with the MA WPA, Riverfront Area (10.58), and North Reading Bylaw/Ordinance. The limit of MAHW associated with the perennial stream was demarcated with a single series of three (3) wetland flags labeled MAHW (200 through 202E), where the terminal flag meets Bordering Vegetated Wetlands (BVW).

MAHW 300 Series

The 300-series is located on the northern side of Chestnut Street. This delineation is also associated with the existing USGS Mapped Perennial stream (Ipswich River), which broadcasts associated buffer zones and setback zones in accordance with the MA WPA, Riverfront Area (10.58), and North Reading Bylaw/Ordinance. The limit of MAHW associated with the 300-Series was demarcated with four (4) wetland flags labeled MAHW (300 through 303E).

MAHW 400 Series

The 400-series is north and runs parallel to the 300 series on the northeastern side of Chestnut Street. This delineation is also associated with the existing USGS Mapped Perennial stream (Ipswich River), which broadcasts associated buffer zones and setback zones in accordance with the MA WPA, Riverfront Area (10.58), and North Reading Bylaw/Ordinance. The limit of MAHW associated with the Bank flag series was demarcated with a series of three (3) wetland flags labeled MAHW (400 through 402E).

On the up-gradient side of the stream embankments was disturbed paved roadway with bituminous concrete. On both ends of the flag series were culverts where the hydrologic flow was moving through the pond complex. Upland soils consisted of urban fill along the roadway and embankment.

As requested, two (2) sets of data forms have been filled out accordingly and attached to this report.

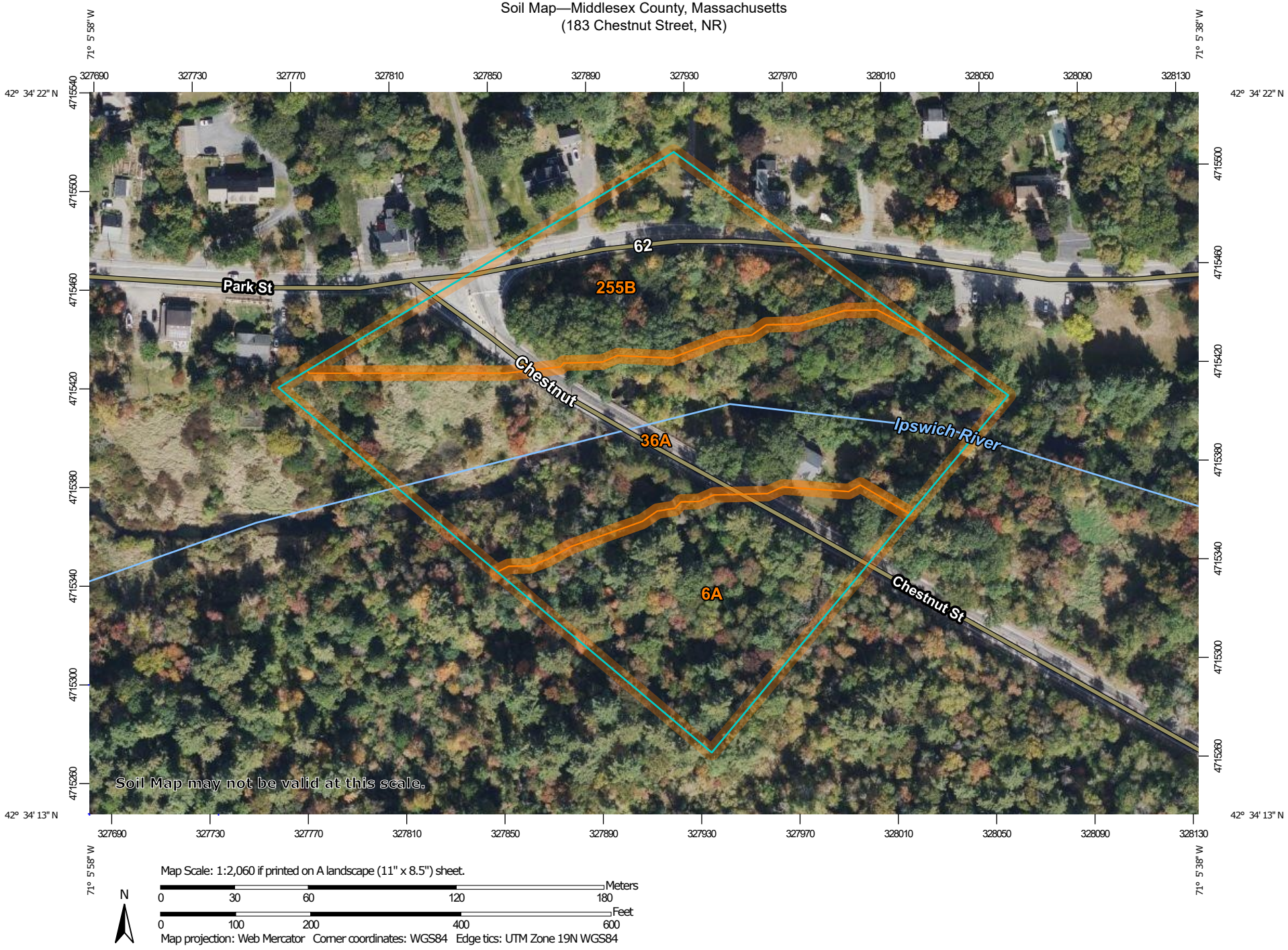
If you have any questions regarding the delineation, please contact me at dmorse@hancockassociates.com or 978-777-3050 ext. 413.

Devon Morse, WPIT
Project Manager/Wetland Scientist
Hancock Associates

Attachments:

A – Data Forms

Soil Map—Middlesex County, Massachusetts
(183 Chestnut Street, NR)



Map Scale: 1:2,060 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2020—Oct 18, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	2.3	25.2%
36A	Saco mucky silt loam, frequently ponded, 0 to 1 percent slopes, frequently flooded	4.2	47.3%
255B	Windsor loamy sand, 3 to 8 percent slopes	2.5	27.5%
Totals for Area of Interest		**9.0**	**100.0%**

MassDEP Field Data Form and Instructions

The Department of Environmental Protection's field data form should be used when delineating the boundary of a Bordering Vegetated Wetland (BVW) under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations (310 CMR 10.55). It should be used whether the boundary is delineated by vegetation alone or by vegetation and other indicators of wetland hydrology. Note: if detailed vegetative assessment is not necessary for the site, make a note on the data form and submit it. The field data form should be submitted with a Request for Determination of Applicability or a Notice of Intent. Details on the criteria for delineating a BVW boundary and the terminology used in this field data form are described in the handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MA Department of Environmental Protection, Division of Wetlands and Waterways, 1995).

INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:
Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;
Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);
Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and
Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

    - plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
    - plants with a percent dominance of 20 percent or greater;
    - plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.
2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:
    - plant species listed in the Wetlands Protection Act;
    - plants in the genus *Sphagnum*;
    - plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland(FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
    - plants with morphological or physiological adaptations (such as buttressed or
    - fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **TEC** Prepared by: **Devon Morse, WPIT** Project location: **Chestnut Street, North Reading** DEP File #: **N/A**

Check all that apply:

- ☑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☐ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: **UPL Plot 1**		Transect Number: **WFB100**	Date of Delineation: **August 16th, 2022**
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Groundcover				
White goosfoot (*Chenopodium album*)	5.0	7%	NO	FACU+
American burnweed (*Erechtites hieraciifolius*)	10.0	15%	YES	FACU
common wormwood (*Artemisia vulgaris)*	40.0	59%	YES	UPL
common wrinkle-leaved goldenrod (*Solidago rugosa)*	10.0	15%	YES	FAC*
Chinese foxtail (*Setaria faberi)*	3.0	4%	NO	FACU
Vine				
Poison ivy (*Toxicodendron radicans*)	40.0	67%	YES	FAC*
Virginia creeper (*Parthenocissus quinquefolia*)	20.0	33%	YES	FACU
Shrub				
glossy buckthorn (*Frangula alnus*)	10.0	100%	YES	FAC*
Tree				
American elm (*Ulmus americana)*	20.0	46%	YES	FACW*
Eastern white pine (*Pinus strobus)*	3.0	7%	NO	FACU
northern red oak (*Quercus rubra)*	20.0	46%	YES	FACU

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: **3 total** Number of dominant non-wetland indicator plants: **4 total**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes **no**

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date: **Middlesex County, Massachusetts**
map number: **MA6017**
soil type mapped: **Saco mucky silt loam, frequently ponded, 0 to 1 percent slopes, frequently flooded and Windsor loamy sand, 3 to 8 percent slopes**
hydric soil inclusions: **Swansea, Freetown and Limerick)**

Are field observations consistent with soil survey? yes **no**

Remarks:

No soils were observed on this plot as it was on the slope of a disturbed urban roadway

2. Soil Description

Horizon Depth Matrix Color Mottles Color

Remarks:
Refusal at 2”

3. Other:

Conclusion: Is soil hydric? yes **no**

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: **No**
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- ❑ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	_____	**X**
Wetland hydrology present:		
Hydric soil present	_____	**X**
Other indicators of hydrology present	_____	**X**
Sample location is in a BVW	_____	**X**

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Field Data Form and Instructions

The Department of Environmental Protection's field data form should be used when delineating the boundary of a Bordering Vegetated Wetland (BVW) under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations (310 CMR 10.55). It should be used whether the boundary is delineated by vegetation alone or by vegetation and other indicators of wetland hydrology. Note: if detailed vegetative assessment is not necessary for the site, make a note on the data form and submit it. The field data form should be submitted with a Request for Determination of Applicability or a Notice of Intent. Details on the criteria for delineating a BVW boundary and the terminology used in this field data form are described in the handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MA Department of Environmental Protection, Division of Wetlands and Waterways, 1995).

INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:
Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;
Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);
Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and
Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

    - plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
    - plants with a percent dominance of 20 percent or greater;
    - plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.
2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:
    - plant species listed in the Wetlands Protection Act;
    - plants in the genus *Sphagnum*;
    - plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland(FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
    - plants with morphological or physiological adaptations (such as buttressed or
    - fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **TEC** Prepared by: **Devon Morse, WPIT** Project location: **Chestnut Street, North Reading** DEP File #: **N/A**

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: **UPL Plot 2**		Transect Number: **WFA101**	Date of Delineation: **August 16th, 2022**
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Groundcover				
American burnweed (*Erechtites hieraciifolius*)	10.0	10%	NO	FACU
common wormwood (*Artemisia vulgaris)*	40.0	40%	YES	UPL
common wrinkle-leaved goldenrod (*Solidago rugosa)*	10.0	10%	NO	FAC*
Canada mayflower (*Maianthemum canadense*)	20.0	20%	YES	FACU
cinnamon fern (*Osmundastrum cinnamomeum*)	10.0	10%	NO	FACW*
hairy crabgrass (*Digitaria sanguinalis)*	10.0	10%	NO	FACU
Vine				
Poison ivy (*Toxicodendron radicans*)	50.0	100%	YES	FAC*
Shrub				
glossy buckthorn (*Frangula alnus*)	10.0	43%	YES	FAC*
smooth arrow wood (*Viburnum dentatum*)	5.0	22%	YES	FAC*
marrows honeysuckle (*Lonicera morrowii*)	5.0	22%	YES	FACU
highbush blueberry (*Vaccinium corymbosum)*	3.0	13%	NO	FACW*
Tree				
red maple (*Acer rubrum)*	10.0	20%	YES	FAC*
Eastern white pine (*Pinus strobus)*	30.0	60%	YES	FACU
northern red oak (*Quercus rubra)*	10.0	20%	YES	FACU

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: **4 total** Number of dominant non-wetland indicator plants: **5 total**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes (**no**)

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date: **Middlesex County, Massachusetts**
map number: **MA6017**
soil type mapped: **Saco mucky silt loam, frequently ponded, 0 to 1 percent slopes, frequently flooded and Windsor loamy sand, 3 to 8 percent slopes**
hydric soil inclusions: **Swansea, Freetown and Limerick)**

Are field observations consistent with soil survey? yes **no**

Remarks:
No hydric soils observed within data plot auger

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O	**0-4”**		
A	**4-16”**	**10YR 3/2**	**yellow FLS**
B 1	**6- 20”**	**10YR 5/6**	**yellow**

Remarks:

3. Other:

Conclusion: Is soil hydric? yes **no**

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: **No**
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- ❑ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	_____	**X**
Wetland hydrology present:		
Hydric soil present	_____	**X**
Other indicators of hydrology present	_____	**X**
Sample location is in a BVW	_____	**X**

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Field Data Form and Instructions

The Department of Environmental Protection's field data form should be used when delineating the boundary of a Bordering Vegetated Wetland (BVW) under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations (310 CMR 10.55). It should be used whether the boundary is delineated by vegetation alone or by vegetation and other indicators of wetland hydrology. Note: if detailed vegetative assessment is not necessary for the site, make a note on the data form and submit it. The field data form should be submitted with a Request for Determination of Applicability or a Notice of Intent. Details on the criteria for delineating a BVW boundary and the terminology used in this field data form are described in the handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MA Department of Environmental Protection, Division of Wetlands and Waterways, 1995).

INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:
Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;
Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);
Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and
Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

    - plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
    - plants with a percent dominance of 20 percent or greater;
    - plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.
2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:
    - plant species listed in the Wetlands Protection Act;
    - plants in the genus *Sphagnum*;
    - plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland(FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
    - plants with morphological or physiological adaptations (such as buttressed or
    - fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **TEC** Prepared by: **Devon Morse, WPIT** Project location: **Chestnut Street, North Reading** DEP File #: **N/A**

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: **WET Plot 1**		Transect Number: **WFB101**	Date of Delineation: **August 16th 2022**
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Herbaceous				
sensitive fern (*Onoclea sensibilis*)	10.0	15%	YES	FACW*
common reed (*Phragmites australis*)	15.0	22%	YES	OBL*
eastern straw sedge (*Carex straminea)*	30.0	44%	YES	OBL*
American burnweed (*Erechtites hieraciifolius*)	10.0	15%	YES	FACU
calico American-aster (*Symphyotrichum lateriflorum*)	3.0	4%	NO	FAC*
Vine				
Poison ivy (*Toxicodendron radicans*)	30.0	75%	YES	FAC*
Virginia creeper (*Parthenocissus quinquefolia*)	5.0	12%	NO	FACU
Fox grape (*Vitis labrusca)*	5.0	12%	NO	FACU
Shrub				
glossy buckthorn (*Frangula alnus*)	25.0	100%	YES	FAC*
Tree				
red maple (*Acer rubrum)*	10.0	26%	YES	FAC*
American elm (*Ulmus americana)*	5.0	18%	YES	FACW*
northern red oak (*Quercus rubra)*	3.0	11%	NO	FACU
long beaked willow (*Salix bebbiana)*	5.0	18%	YES	FACW*
Swamp white oak (*Quercus bicolor)*	5.0	18%	YES	FACW*

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: **9 total** Number of dominant non-wetland indicator plants: **1 total**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date: **Middlesex County, Massachusetts**
map number: **MA6017**
soil type mapped: **Saco mucky silt loam, frequently ponded, 0 to 1 percent slopes, frequently flooded and Windsor loamy sand, 3 to 8 percent slopes**
hydric soil inclusions: **Swansea, Freetown and Limerick**

Are field observations consistent with soil survey? **yes** no
Remarks:
Mucky silt loam 0-13" and 13-20" silt loam

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O	**0-2"**		
A	**2-16"**	**10YR 3/1**	**gley**
B	**16-20"**	**5Y 2.5/1**	**gley & oran**

Remarks:

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: **No**
- ❑ Depth to free water in observation hole: **20"**
- ❑ Depth to soil saturation in observation hole: **16"**
- ❑ Water marks: **Yes**
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: **Yes**
- ❑ Oxidized rhizospheres: **Yes**
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other): **Perennial stream running between wetlands**
- ❑ Other: **Buttressed root systems**

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	**X**	____
Wetland hydrology present:		
Hydric soil present	**X**	_____
Other indicators of hydrology present	**X**	_____
Sample location is in a BVW	**X**	_____

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Field Data Form and Instructions

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INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:
Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;
Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);
Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and
Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

    - plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
    - plants with a percent dominance of 20 percent or greater;
    - plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.
2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:
    - plant species listed in the Wetlands Protection Act;
    - plants in the genus *Sphagnum*;
    - plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland(FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
    - plants with morphological or physiological adaptations (such as buttressed or
    - fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **TEC** Prepared by: **Devon Morse, WPIT** Project location: **Chestnut Street, North Reading** DEP File #: **N/A**

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: **WET Plot 1**		Transect Number: **WFA102**	Date of Delineation: **August 16th 2022**
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Herbaceous				
American burnweed (*Erechtites hieraciifolius*)	5.0	13%	NO	FACU
cinnamon fern (*Osmundastrum cinnamomeum*)	20.0	50%	YES	FACW*
smooth goldenrod (*Solidago gigantea*)	10.0	25%	YES	FACW*
common wormwood (*Artemisia vulgaris*)	5.0	13%	NO	UPL
Vine				
Poison ivy (*Toxicodendron radicans*)	50.0	100%	YES	FAC*
Shrub				
glossy buckthorn (*Frangula alnus*)	20.0	25%	YES	FAC*
coastal sweet pepperbush (*Clethra alnifolia*)	60.0	75%	YES	FAC*
Tree				
red maple (*Acer rubrum)*	20.0	80%	YES	FAC*
American elm (*Ulmus americana)*	5.0	20%	YES	FACW*

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: **7 total** Number of dominant non-wetland indicator plants: **0 total**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (**yes**) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date: **Middlesex County, Massachusetts**
map number: **MA6017**
soil type mapped: **Saco mucky silt loam, frequently ponded, 0 to 1 percent slopes, frequently flooded and Windsor loamy sand, 3 to 8 percent slopes**
hydric soil inclusions: **Swansea, Freetown and Limerick**

Are field observations consistent with soil survey? **yes** no
Remarks:
Mucky silt loam 0-13" and 13-20" silt loam

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O	**0-3"**		
A	**3-12"**	**10YR 2/1**	
B	**12-16"**	**10YR 2/4**	**orange**

Remarks:

16- 20" color change w/ redox 2.5Y 6/2

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: **No**
- ❑ Depth to free water in observation hole:_____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: **Yes**
- ❑ Water-stained leaves: **Yes**
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other): **Perennial stream running between wetlands**
- ❑ Other: **Buttressed root systems and lenticels.**

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	**X**	____
Wetland hydrology present:		
Hydric soil present	**X**	_____
Other indicators of hydrology present	**X**	_____
Sample location is in a BVW	**X**	_____

Submit this form with the Request for Determination of Applicability or Notice of Intent.