



500A Washington Street, Quincy, MA 02169

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April 14, 2020

Fuss & O'Neill, Inc.  
Attn: Jon Allard  
1550 Main Street, Suite 400  
Springfield, MA 01103

Re: Wetland Summary Report  
Leo Drive & Clark Street (PID H37-9-13A & H37-23-40)  
Gardner, MA 01440

Dear Mr. Allard,

Professional Wetland Scientists (PWS) from Lucas Environmental, LLC (LE) conducted site investigations at two parcels of land located west of Leo Drive in Gardner, Massachusetts on March 5<sup>th</sup> and 11<sup>th</sup>, 2020 to determine if wetland resources were present within or near the Study Area. The purpose of the site investigations was to identify wetlands, watercourses, and other regulated wetland and “special” resources that may exist within 100 feet of the Study Area (200 feet for perennial streams) to inform the design and permitting of future development. Please note that this effort is specific to wetland resources; it does not evaluate constraints related to local planning or zoning requirements, nor does it evaluate the potential for soil, air, or water contamination.

The wetland investigation was performed in accordance with the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40) and regulations (310 CMR 10.00 et seq.); Section 404 of the Clean Water Act (33 U.S.C. 1344); Massachusetts Department of Environmental Protection (MassDEP) publication “Delineating Bordering Vegetated Wetlands” under the Massachusetts Wetlands Protection Act (1995); the U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual (1987); the Northcentral and Northeast Regional Supplement (2012); and the City of Gardner Wetlands Protection Ordinance (Chapter 650).

The following data sources were examined prior to the site investigation:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps;
- United States Geological Survey Topographic Quadrangle;
- MassGIS MassDEP Wetland and Hydrography Datalayers;
- MassGIS Natural Heritage Atlas Datalayers; and
- United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Soil Survey.

## 1.0 EXISTING CONDITIONS

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The Study Area consists of two parcels of undeveloped land located west of Leo Drive in Gardner, Massachusetts. The parcels are identified in the Gardner Assessors database as PID H37-9-13A & H37-23-40.

Most of the Study Area has been cleared as part of an approved Forest Cutting Plan (File #103-8155-16). The Study Area is bound by residential development to the east, Clark Street to the south, and Bailey Brook to the west. Wetland resource areas are described below. MassDEP Bordering Vegetated Wetland Delineation Field Data Forms were completed and are included with this letter.

The Study Area consists of primarily undeveloped forested uplands and wetlands. Bailey Brook flows in a southerly direction west of the Study Area. The Study Area contains secondary regrowth of what was previously logged. This includes American Beech (*Fagus grandifolia*), red oak (*Quercus rubra*), black cherry (*Prunus serotina*), white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), hop hornbeam (*Ostrya virginiana*), yellow birch (*Betula alleghaniensis*), black birch (*Betula lenta*), and gray birch (*Betula populifolia*). Common shrubs include mountain laurel (*Kalmia latifolia*), blackberry (*Rubus allegheniensis*), and shrubs of the above noted tree species. Common herbaceous species in the upland include goldenrods (*Solidago sp.*), bracken fern (*Pteridium aquilinum*), grasses, and sweet fern (*Comptonia peregrina*).

A review of the current MassGIS data layer for the Massachusetts Natural Heritage Atlas (effective August 1, 2017) under the Natural Heritage and Endangered Species Program (NHESP) indicates that the Study Area is not located within Priority Habitat of Rare Species or within Estimated Habitat of Rare Wildlife. No Certified Vernal Pools under the jurisdiction of the Wetlands Protection Act Regulations (310 CMR 10.00 et seq.) or the Massachusetts Endangered Species Act (321 CMR 10.00 et seq.) occur within the Study Area.

The Study Area is not located within an Area of Critical Environmental Concern (ACEC), Outstanding Resource Water (ORW), Watershed Protection Area, or MassDEP Wellhead Protection Area. Bailey Brook is identified as a Cold Water Fishery by the Massachusetts Division of Fisheries and Wildlife.

## **2.0 ENVIRONMENTAL RESOURCE AREAS**

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Wetland resource areas present at the site include Inland Bank, Bordering Vegetated Wetlands (BVW), Land Under Water Bodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), Riverfront Area, and locally regulated IVW. Under the Massachusetts Wetlands Protection Act (WPA) and local Ordinance, resource areas at the Study Area are regulated as follows.

### **2.1 Inland Bank – 310 CMR 10.54**

Section 310 CMR 10.54 of the WPA defines a Bank as *the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland. The upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level.* The delineated Banks are described below.

## **2.2 Bordering Vegetated Wetlands – 310 CMR 10.55**

Section 310 CMR 10.55 of the WPA defines Bordering Vegetated Wetlands 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 boundary of Bordering Vegetated Wetlands is 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 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 Service, U.S. Department of the Interior, 1988) or plants exhibiting physiological or morphological adaptations to life in saturated or inundated conditions.* The delineated BVW area is described below.

## **2.3 Land under Water Bodies and Waterways – 310 CMR 10.56**

Section 310 CMR 10.56 of the WPA defines Land under Water Bodies and Waterways as *the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock. The boundary of Land under Water Bodies and Waterways is the mean annual low water level.* LUWW is present within Bailey Brook. The boundary of LUWW was not delineated in the field.

## **2.4 Bordering Land Subject to Flooding – 310 CMR 10.57**

Section 310 CMR 10.57(2)(a) of the WPA defines BLSF as *an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland. The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm.*

According to the July 2, 1981 FEMA Flood Insurance Rate Maps (FIRM) for Worcester County, Massachusetts, Map Numbers 2503050004B and 2503050005B, it appears that the Study Area is located within a Zone C, which is classified as an area of minimal flooding. However Bailey Brook is mapped as having a Zone A. The Zone A is associated with the 1% annual chance flood (100-year floodplain) where base flood elevations have not been determined. Survey will need to confirm whether BLSF occurs within the Study Area.

## **2.5 Riverfront Area – 310 CMR 10.58**

Section 310 CMR 10.58 of the WPA defines Riverfront Area as *“the area of land between a river’s mean annual high water line and a parallel line measured horizontally.”* 310 CMR 10.58(2)(a)(1) defines rivers as, *“any natural flowing body of water that empties to any ocean, lake, pond or other river and which flows throughout the year. Rivers include streams (see 310 CMR 10.04: Stream) that are perennial because surface water flows within them throughout the year. Intermittent streams are not rivers as defined herein because surface water does not flow within them throughout the year.”*

Section 310 CMR 10.58(2)(a)(2) of the WPA further specifies that “*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,...*”. Bailey Brook is depicted on USGS mapping as a perennial stream, therefore the 200-Foot Riverfront Area extends landward from the Mean Annual High Water (MAHW)/Bank line, which was delineated as the BF1 series described below.

## **2.6 Isolated Vegetated Wetlands**

Isolated Vegetated Wetlands are not regulated under the WPA unless the wetland meets the size and volume requirement to be regulated as Isolated Land Subject to Flooding (ILSF). Although calculations were not performed, it does not appear that any of the IVW areas within the Study Area meet the criteria to be regulated as ILSF. Isolated Vegetated Wetlands are regulated under the City of Gardner Wetlands Protection Ordinance. It should be noted that the approved Forest Cutting Plan did not identify these IVWs and it is possible that the logging operation created these wetland features through compaction of the surface and subsequent ponding of surface water. The delineated IVW areas are described below.

## **2.7 Resource Area Descriptions**

### *Wetland A – BVW*

Wetland A is a BVW flanking the Banks of Bailey Brook. The wetland areas are delineated with pink survey tape numbered sequentially with flag series WFA-1 to WFA-137. The wetland transitions form an emergent marsh along the reach of the river to a forested wetland along its border. The emergent marsh is vegetated with mixed sedges (*Carex* spp.), soft rush (*Juncus effuses*), woolgrass (*Scirpus cyperinus*), broadleaf cattail (*Typha latifolia*), and grasses. The wetland edge is vegetated with a mix of eastern hemlock, white pine, black spruce (*Picea mariana*), balsam fir (*Abies balsamea*), highbush blueberry (*Vaccinium corymbosum*), maleberry (*Lyonia ligustrina*), white pine, and goldthread (*Coptis trifolia*).

The wetland/upland boundary is generally located along a well-defined topographic break. Soils generally consist of loamy fine sand with a depleted matrix and redoximorphic features (concentrations) near the surface over dense rock or muck. Indicators of wetland hydrology include shallow soil saturation, evidence of seasonal inundation, and drainage patterns. State, local, and federal boundaries are coincident.

### *Wetland B – IVW*

Wetland B is an IVW located in the central portion of the Study Area, near the access to the site across from Margaux Way. The wetland is delineated with pink survey tape numbered sequentially with flag series WFB-1 to WFB-21. Wetland B has been logged, and appears to have been used as a staging area for the logging operation. It is possible that the logging operation may have created this wetland feature due to compaction of the soil over dense rock. The wetland consists of a wet meadow vegetated with a mix of yellow birch, gray birch, red maple, soft rush, woolgrass, path rush (*Juncus tenuis*), steeplebush (*Spiraea tomentosa*), bristly dewberry (*Rubus hispidus*), and traces of cattail.

The wetland/upland boundary is located at the upper edge of a broad transition area between the wetland and non-hydrophytic plant community and absence of hydric soils/wetland hydrology. Soils are disturbed due to the logging operation but are generally very stony, shallow, and consist of a thin layer of organic rich fine sandy loam overlying dense rock. Indicators of wetland hydrology include drainage patterns and shallow soil saturation.

Isolated Vegetated Wetlands are regulated under the City of Gardner Wetlands Protection Ordinance, and generally regulated under Section 404 of the Clean Water Act jurisdiction; however, it is LE's opinion that this IVW is not federally jurisdictional. It is only LE's opinion and can be confirmed by filing a Jurisdictional Determination application with the USACE.

#### *Wetland C – IVW*

Wetland C is located in the southeast corner of the Study Area. The wetland edge is delineated with pink survey tape numbered sequentially with flag series WFC-1 to WFC-16. The tree canopy has been logged but stems of red maple and yellow birch remain. The shrub layer is vegetated with red maple and gray dogwood (*Cornus racemosa*). The herbaceous layer is sparse due to the time of year but remnants of cinnamon fern (*Osmundastrum cinnamomea*), sensitive fern (*Onoclea sensibilis*), and bristly dewberry (*Rubus hispida*) were observed.

The wetland/upland boundary is located at the upper edge of a broad transition area between the wetland and non-hydrophytic plant community and absence of hydric soils/wetland hydrology. Soils consist of very shallow mucky mineral surface layer underlain by extremely rocky soil. Hydrological indicators include shallow soil saturation.

Isolated Vegetated Wetlands are regulated under the City of Gardner Wetlands Protection Ordinance, and generally regulated under Section 404 of the Clean Water Act jurisdiction; however, it is LE's opinion that this IVW is not federally jurisdictional. It is only LE's opinion and can be confirmed by filing a Jurisdictional Determination application with the USACE.

#### *Bank 1 – Bailey Brook*

The MAHW/Bank of Bailey Brook was delineated with blue survey flagging numbered sequentially from BF1-1 to BF1-104. Bailey Brook is part of a large emergent wetland system that can be generally characterized as a river with low gradient meanders and soils consisting of histosols within the bordering marshes. As such, the MAHW line of Mine Brook was delineated based upon indicators of bankfull conditions: *changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts*. The MAHW line generally a well-defined Bank line; however, there were also areas where the MAHW line extended further landward toward the toe of slope along Wetland A. Due to the flat topography of the area, it is likely that during and after large rain events, the river crests the Bank and floods the wetland areas.



## 2.8 City of Gardner Wetlands Protection Ordinance

The Gardner Wetlands Protection Ordinance provides additional protections as follows:

- Isolated Vegetated Wetlands are regulated.
- The No-Disturbance Zone includes *lands within 30 feet of any protected resource area except floodplain and riverfront area.*
- The No-Build Zone includes *lands within 30 feet of any no disturbance zone, beginning at the upland edge of the no disturbance zone and extending for 30 feet into the upland.*

If you have any questions, please do not hesitate to contact me at 617.405.4140 or [cml@lucasenvironmental.net](mailto:cml@lucasenvironmental.net). Thank you for your consideration in this matter.

Sincerely,

**LUCAS ENVIRONMENTAL, LLC**

A handwritten signature in blue ink that reads 'Christopher M. Lucas'.

Christopher M. Lucas, PWS, CWS  
Environmental Consultant/Soil Scientist

Enclosures: Wetland Delineation Field Data Forms



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-34

Transect Number: WET-1

Applicant: City of Gardner Prepared by: Lucas Environmental, LLC Project Location: Leo Drive & Clark Street, Gardner

- 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

Date of Delineation: March 11, 2020

A. Sample Layer and 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*
<b><u>Tree</u></b>				
Red Maple ( <i>Acer rubrum</i> )	85.5	96.6%	Yes	FAC*
Black Cherry ( <i>Prunus serotina</i> )	3.0	3.4%	No	FACU
<b><u>Saplings</u></b>				
Red Maple ( <i>Acer rubrum</i> )	3.0	100.0%	Yes	FAC*
<b><u>Shrubs</u></b>				
High Bush Blueberry ( <i>Vaccinium corymbosum</i> )	38.0	50.7%	Yes	FACW*
Maleberry ( <i>Lyonia ligustrina</i> )	10.5	14.0%	No	FACW
White Pine ( <i>Pinus strobus</i> )	20.5	27.3%	Yes	FACU
Eastern Hemlock ( <i>Tsuga canadensis</i> )	3.0	4.0%	No	FACU*
<b><u>Herbaceous</u></b>				
Tussock Sedge ( <i>Carex stricta</i> )	85.5	89.0%	Yes	OBL*
Sheep Laurel ( <i>Kalmia angustifolia</i> )	10.5	11.0%	No	FAC*
Teaberry ( <i>Gaultheria procumbens</i> )	T	-	-	FACU
<b><u>Vines</u></b>				
None				

\* Use an asterisk to mark 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**                      Number of dominant non-wetland indicator plants: **1**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants:    YES                       NO



# WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-34

Transect Number: WET-1

## SECTION II. INDICATORS OF HYDROLOGY

### Hydric Soil Interpretation

#### 1. Soil Survey

Is there a published soil survey for this site? YES  NO

Title/Date: **Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online January 15, 2020**

Map Number/Soil Type Mapped:

- 59A – Bucksport & Wonsqueak mucks, 0-2% slopes;**
- 901E – Berkshire-Marlow association, 15-45% slopes, extremely stony**
- 905C – Peru-Marlow association, 3-15% slopes, extremely stony**

Hydric Soil Inclusions: **Yes**

Are field observations consistent with soil survey? YES  NO

Remarks:

#### 2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
<b>Oa</b>	<b>0-10"</b>	<b>10YR 2/1</b>	
<b>R</b>			

Remarks: **Muck over rock**

#### 3. Other:

Conclusion: Is soil hydric? YES  NO

### Other Indicators of Hydrology:

- Site inundated: \_\_\_\_\_
- Depth to free water in observation hole: **Surface** \_\_\_\_\_
- Depth to soil saturation in observation hole: \_\_\_\_\_
- Water marks: \_\_\_\_\_
- Drift lines: \_\_\_\_\_
- Sediment deposits: \_\_\_\_\_
- Drainage patterns in BVW: \_\_\_\_\_
- Oxidized rhizospheres: \_\_\_\_\_
- Water-stained leaves: \_\_\_\_\_
- Recorded data (stream, lake, or tidal gauge; aerial photo; other): \_\_\_\_\_
- Other: **Buttressed tree roots** \_\_\_\_\_

Vegetation and Hydrology Conclusion	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydric soils present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other indicators of hydrology present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Sample location is in BVW</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-34

Transect Number: UPL-1

Applicant: City of Gardner Prepared by: Lucas Environmental, LLC Project Location: Leo Drive & Clark Street, Gardner

- 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

Date of Delineation: March 11, 2020

A. Sample Layer and 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*
<b><u>Tree</u></b>				
Black Cherry ( <i>Prunus serotina</i> )	38.0	55.1%	Yes	FACU
White Pine ( <i>Pinus strobus</i> )	20.5	29.7%	Yes	FACU
Red Maple ( <i>Acer rubrum</i> )	10.5	15.2%	No	FAC*
<b><u>Saplings</u></b>				
None				
<b><u>Shrubs</u></b>				
White Pine ( <i>Pinus strobus</i> )	10.5	38.9%	Yes	FACU
Eastern Hemlock ( <i>Tsuga canadensis</i> )	10.5	38.9%	Yes	FACU*
Black Spruce ( <i>Picea maritima</i> )	3.0	11.1%	No	FACW
American Beech ( <i>Fagus grandifolia</i> )	3.0	11.1%	No	FACU
<b><u>Herbaceous</u></b>				
Teaberry ( <i>Gaultheria procumbens</i> )	85.5	80.3%	Yes	FACU
Princess Pine ( <i>Lycopodium obscurum</i> )	10.5	9.8%	No	FACU
Sheep Laurel ( <i>Kalmia angustifolia</i> )	10.5	9.8%	No	FAC*
<b><u>Vines</u></b>				
None				

\* Use an asterisk to mark 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: **1**                      Number of non-wetland indicator plants: **4**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants:    YES                       NO



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFA-34

Transect Number: UPL-1

### SECTION II. INDICATORS OF HYDROLOGY

#### Hydric Soil Interpretation

##### 1. Soil Survey

Is there a published soil survey for this site?    YES     NO

Title/Date: **Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online January 15, 2020**

Map Number/Soil Type Mapped:

- 59A – Bucksport & Wonsqueak mucks, 0-2% slopes;**
- 901E – Berkshire-Marlow association, 15-45% slopes, extremely stony**
- 905C – Peru-Marlow association, 3-15% slopes, extremely stony**

Hydric Soil Inclusions: **Yes**

Are field observations consistent with soil survey?    YES     NO

Remarks:

##### 2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
<b>Oa</b>	<b>1-0"</b>		
<b>A</b>	<b>0-3"</b>	<b>10YR 2/2</b>	
<b>Bw</b>	<b>3-8"</b>	<b>10YR 3/4</b>	
<b>Rock</b>			

Remarks: **Soil texture – fine sandy loam**

##### 3. Other:

Conclusion: Is soil hydric?                    YES                     NO

#### Other Indicators of Hydrology:

- Site inundated: \_\_\_\_\_
- 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 (stream, lake, or tidal gauge; aerial photo; other): \_\_\_\_\_
- Other: \_\_\_\_\_

Vegetation and Hydrology Conclusion	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hydric soils present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other indicators of hydrology present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Sample location is in BVW</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>





## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFB-15

Transect Number: WET-1

### SECTION II. INDICATORS OF HYDROLOGY

#### Hydric Soil Interpretation

##### 1. Soil Survey

Is there a published soil survey for this site?    YES     NO

Title/Date: **Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online January 15, 2020**

Map Number/Soil Type Mapped:

- 59A – Bucksport & Wonsqueak mucks, 0-2% slopes;**
- 901E – Berkshire-Marlow association, 15-45% slopes, extremely stony**
- 905C – Peru-Marlow association, 3-15% slopes, extremely stony**

Hydric Soil Inclusions: **Yes**

Are field observations consistent with soil survey?    YES     NO

Remarks:

##### 2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
<b>Oa</b>	<b>0-2"</b>		
<b>A</b>	<b>0-5"</b>	<b>10YR 2/1</b>	<b>(mucky)</b>
<b>Bg</b>	<b>5-8"</b>	<b>10YR 5/2</b>	<b>10% conc. 5/6 2% depletions</b>
<b>R</b>			

Remarks: fine **sandy loam**

##### 3. Other:

Conclusion: Is soil hydric?                            YES                             NO

#### Other Indicators of Hydrology:

- Site inundated: \_\_\_\_\_
- Depth to free water in observation hole: \_\_\_\_\_
- Depth to soil saturation in observation hole: **Surface** \_\_\_\_\_
- Water marks: \_\_\_\_\_
- Drift lines: \_\_\_\_\_
- Sediment deposits: \_\_\_\_\_
- Drainage patterns in BVW: \_\_\_\_\_
- Oxidized rhizospheres: \_\_\_\_\_
- Water-stained leaves: \_\_\_\_\_
- Recorded data (stream, lake, or tidal gauge; aerial photo; other): \_\_\_\_\_
- Other: \_\_\_\_\_

Vegetation and Hydrology Conclusion	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydric soils present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other indicators of hydrology present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Sample location is in BVW</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFB-15

Transect Number: UPL-1

Applicant: City of Gardner Prepared by: Lucas Environmental, LLC Project Location: Leo Drive & Clark Street, Gardner

- 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

Date of Delineation: March 11, 2020

A. Sample Layer and 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*
------------------------------------------------------------------	-------------------------------------	----------------------	----------------------------------	-----------------------------------

Tree  
None

Saplings  
None

**Shrubs**

Sweet Fern ( <i>Comptonia peregrina</i> )	38.0	64.4%	Yes	NL
Hop Hornbeam ( <i>Ostrya virginiana</i> )	10.5	17.8%	No	FACU
Red Maple ( <i>Acer rubrum</i> )	10.5	17.8%	No	FAC*

**Herbaceous**

Pennsylvania Sedge ( <i>Carex pensylvanica</i> )	38.0	48.1%	Yes	NL
High Bush Blueberry ( <i>Vaccinium corymbosum</i> )	20.5	25.9%	Yes	FACW*
Soft Rush ( <i>Juncus effuses</i> )	20.5	25.9%	Yes	OBL

Vines  
None

\* Use an asterisk to mark 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:      2                      Number of non-wetland indicator plants:      2

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants:      YES                       NO



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFB-15

Transect Number: UPL-1

### SECTION II. INDICATORS OF HYDROLOGY

#### Hydric Soil Interpretation

##### 1. Soil Survey

Is there a published soil survey for this site?    YES     NO

Title/Date: **Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online January 15, 2020**

Map Number/Soil Type Mapped:

- 59A – Bucksport & Wonsqueak mucks, 0-2% slopes;**
- 901E – Berkshire-Marlow association, 15-45% slopes, extremely stony**
- 905C – Peru-Marlow association, 3-15% slopes, extremely stony**

Hydric Soil Inclusions: **Yes**

Are field observations consistent with soil survey?    YES     NO

Remarks:

##### 2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
<b>Oa</b>	<b>1-0"</b>		
<b>A</b>	<b>0-3"</b>	<b>10YR 2/2</b>	
<b>Bw1</b>	<b>3-6"</b>	<b>10YR 4/4</b>	<b>4% conc. 5/6</b>
<b>Bw2</b>	<b>6-15"</b>	<b>10YR 5/6</b>	
<b>R</b>			

Remarks: Bw horizon mixed/disturbed. There are redox features at 6"

##### 3. Other:

Conclusion: Is soil hydric?                    YES                     NO

#### Other Indicators of Hydrology:

- Site inundated: \_\_\_\_\_
- 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 (stream, lake, or tidal gauge; aerial photo; other): \_\_\_\_\_
- Other: \_\_\_\_\_

Vegetation and Hydrology Conclusion	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydric soils present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other indicators of hydrology present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Sample location is in BVW</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-5

Transect Number: WET-1

Applicant: City of Gardner Prepared by: Lucas Environmental, LLC Project Location: Leo Drive & Clark Street, Gardner

- 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

Date of Delineation: March 11, 2020

A. Sample Layer and 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*
<b><u>Tree</u></b>				
Red Maple ( <i>Acer rubrum</i> )	85.5	80.3%	Yes	FAC*
Black Birch ( <i>Betula lenta</i> )	10.5	9.8%	No	FACU
Hop Hornbeam ( <i>Ostrya virginiana</i> )	10.5	9.8%	No	FACU
<b><u>Saplings</u></b>				
None				
<b><u>Shrubs</u></b>				
Silky Dogwood ( <i>Cornus amomum</i> )	20.5	32.8%	Yes	FACW*
Red Maple ( <i>Acer rubrum</i> )	10.5	16.8%	Yes	FAC*
Hop Hornbeam ( <i>Ostrya virginiana</i> )	10.5	16.8%	Yes	FACU
Gray Birch ( <i>Betula populifolia</i> )	10.5	16.8%	Yes	FAC*
American Beach ( <i>Fagus grandifolia</i> )	10.5	16.8%	Yes	FACU
<b><u>Herbaceous</u></b>				
Prickly Dewberry ( <i>Rubus hispidus</i> )	63.0	82.5%	Yes	FACW*
Soft Rush ( <i>Juncus effuses</i> )	10.5	13.7%	No	OBL*
Yellow Birch ( <i>Betula alleghaniensis</i> )	3.0	3.9%	No	FAC*

**Vines**  
None

\* Use an asterisk to mark 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: **5**                      Number of non-wetland indicator plants: **2**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants:    YES                       NO



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-5

Transect Number: WET-1

### SECTION II. INDICATORS OF HYDROLOGY

#### Hydric Soil Interpretation

##### 1. Soil Survey

Is there a published soil survey for this site?    YES     NO

Title/Date: **Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online January 15, 2020**

Map Number/Soil Type Mapped:

- 59A – Bucksport & Wonsqueak mucks, 0-2% slopes;**
- 901E – Berkshire-Marlow association, 15-45% slopes, extremely stony**
- 905C – Peru-Marlow association, 3-15% slopes, extremely stony**

Hydric Soil Inclusions: **Yes**

Are field observations consistent with soil survey?    YES     NO

Remarks:

##### 2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
<b>O</b>	<b>3-0"</b>		
<b>A</b>	<b>0-6"</b>	<b>10YR 2/2</b>	
<b>Bg</b>	<b>6-10"</b>	<b>10YR 5/2</b>	<b>5% conc</b>
<b>R</b>			

Remarks: **Soils extremely stony.**

##### 3. Other:

Conclusion: Is soil hydric?                    YES                     NO

#### Other Indicators of Hydrology:

- Site inundated: \_\_\_\_\_
- Depth to free water in observation hole: \_\_\_\_\_
- Depth to soil saturation in observation hole: **Surface** \_\_\_\_\_
- Water marks: \_\_\_\_\_
- Drift lines: \_\_\_\_\_
- Sediment deposits: \_\_\_\_\_
- Drainage patterns in BVW: \_\_\_\_\_
- Oxidized rhizospheres: \_\_\_\_\_
- Water-stained leaves: \_\_\_\_\_
- Recorded data (stream, lake, or tidal gauge; aerial photo; other): \_\_\_\_\_
- Other: \_\_\_\_\_

Vegetation and Hydrology Conclusion	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydric soils present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other indicators of hydrology present	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Sample location is in BVW</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-5

Transect Number: UPL-1

Applicant: City of Gardner Prepared by: Lucas Environmental, LLC Project Location: Leo Drive & Clark Street, Gardner

- 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

Date of Delineation: March 11, 2020

A. Sample Layer and 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*
<b><u>Tree</u></b>				
Red Maple ( <i>Acer rubrum</i> )	63.0	58.6%	Yes	FAC*
Hop Hornbeam ( <i>Ostrya virginiana</i> )	20.5	19.1%	No	FACU
Black Oak ( <i>Quercus velutina</i> )	10.5	9.7%	No	NL
White Oak ( <i>Quercus alba</i> )	10.5	9.7%	No	FACU
Eastern Hemlock ( <i>Tsuga canadensis</i> )	3.0	2.8%	No	FACU*
<b><u>Saplings</u></b>				
None				
<b><u>Shrubs</u></b>				
American Beech ( <i>Fagus grandifolia</i> )	10.5	25.0%	Yes	FACU
Gray Dogwood ( <i>Cornus racemosa</i> )	10.5	25.0%	Yes	FAC*
Black Birch ( <i>Betula lenta</i> )	10.5	25.0%	Yes	FACU
Red Maple ( <i>Acer rubrum</i> )	10.5	25.0%	Yes	FAC*
<b><u>Herbaceous</u></b>				
Prickly Dewberry ( <i>Rubus hispidus</i> )	38.0	78.3%	Yes	FACW*
Christmas Fern ( <i>Polystichum acrostichoides</i> )	10.5	21.7%	Yes	FACU
<b><u>Vines</u></b>				
None				

\* Use an asterisk to mark 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**                      Number of non-wetland indicator plants: **3**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants:    YES                       NO



## WETLAND DELINEATION FIELD DATA FORM

Observation Plot Number: WFC-5

Transect Number: UPL-1

### SECTION II. INDICATORS OF HYDROLOGY

#### Hydric Soil Interpretation

##### 1. Soil Survey

Is there a published soil survey for this site?    YES     NO

Title/Date: **Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS) Accessed online January 15, 2020**

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- 905C – Peru-Marlow association, 3-15% slopes, extremely stony**

Hydric Soil Inclusions: **Yes**

Are field observations consistent with soil survey?    YES     NO

Remarks:

##### 2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
A	0-3"	10YR 3/2	
Bw1	3-6"	2.5Y 4/3	
Bw2	6-12"	2.5Y 5/4	
R			

Remarks: **Soils very stony.**

##### 3. Other:

Conclusion: Is soil hydric?                    YES                     NO

#### Other Indicators of Hydrology:

- Site inundated: \_\_\_\_\_
- 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 (stream, lake, or tidal gauge; aerial photo; other): \_\_\_\_\_
- Other: \_\_\_\_\_

Vegetation and Hydrology Conclusion	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydric soils present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other indicators of hydrology present	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Sample location is in BVW</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>