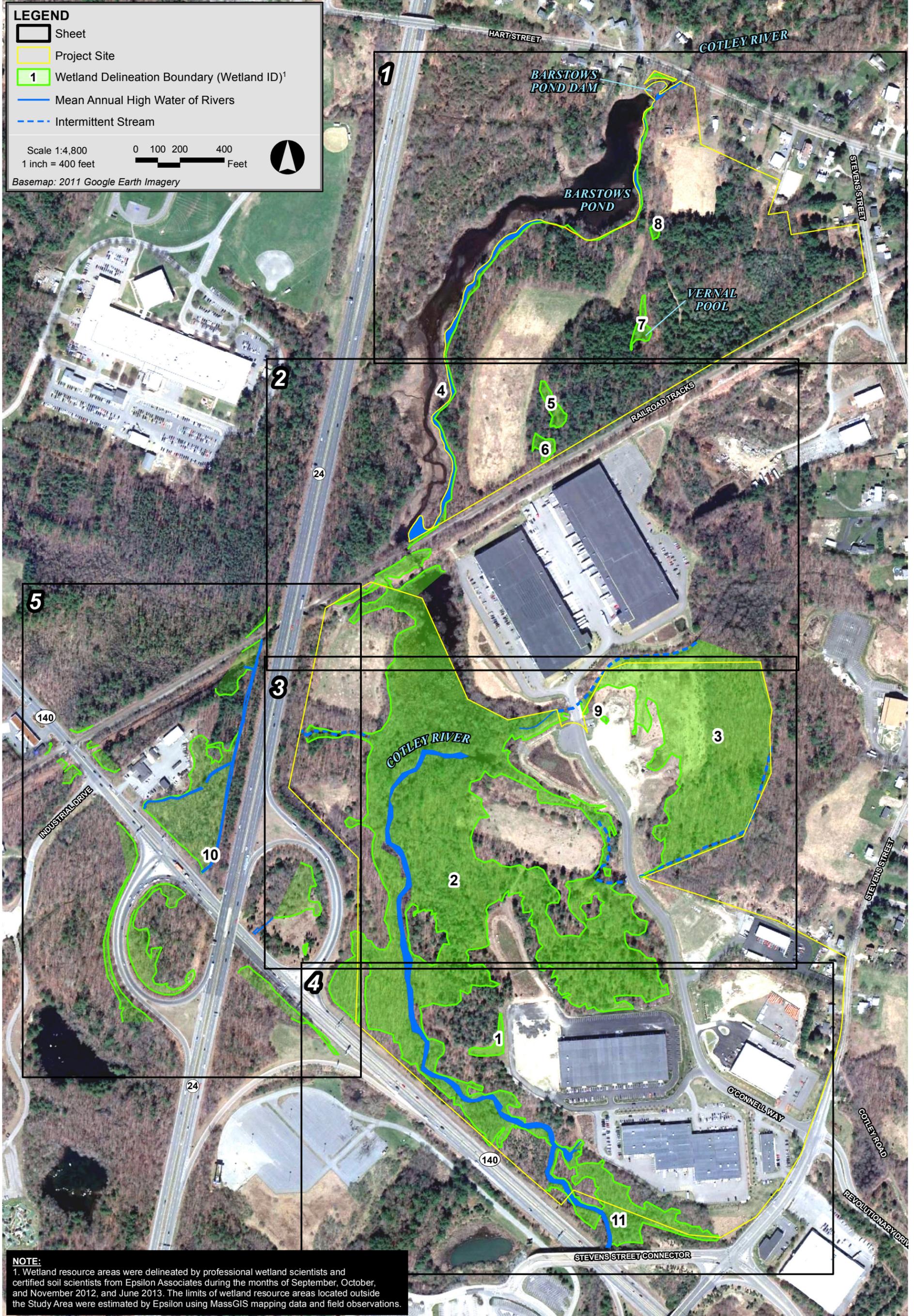


WETLANDS TECHNICAL APPENDIX

Appendix C-1	Delineation Maps
Appendix C-2	Wetlands Determination Forms
Appendix C-3	Functions and Values Assessment
Appendix C-4	Vernal Pool Characterization and Valuation Form

Appendix C-1
Delineation Maps



NOTE:
1. Wetland resource areas were delineated by professional wetland scientists and certified soil scientists from Epsilon Associates during the months of September, October, and November 2012, and June 2013. The limits of wetland resource areas located outside the Study Area were estimated by Epsilon using MassGIS mapping data and field observations.

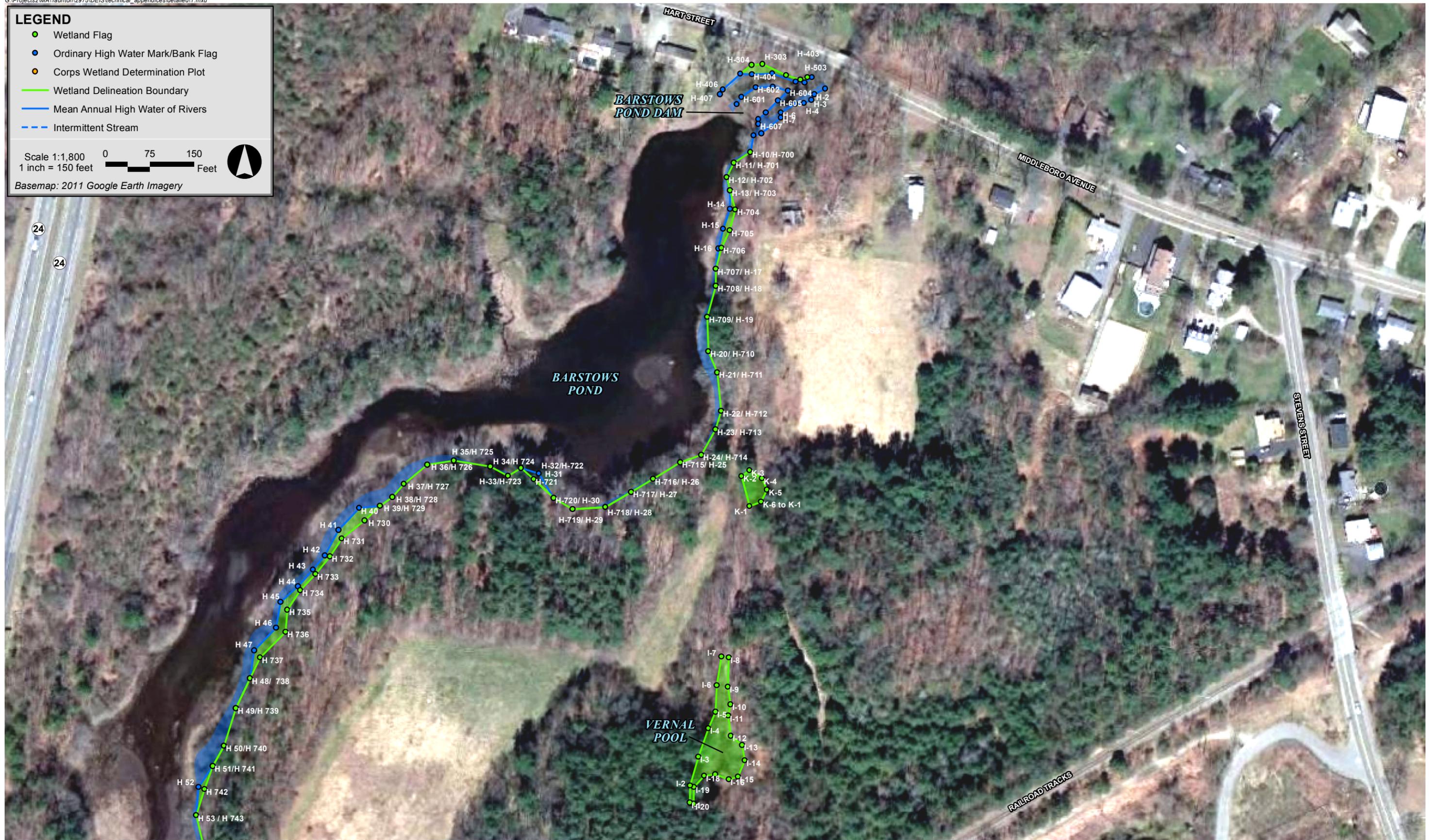
LEGEND

- Wetland Flag
- Ordinary High Water Mark/Bank Flag
- Corps Wetland Determination Plot
- Wetland Delineation Boundary
- Mean Annual High Water of Rivers
- - - Intermittent Stream

Scale 1:1,800
1 inch = 150 feet



Basemap: 2011 Google Earth Imagery







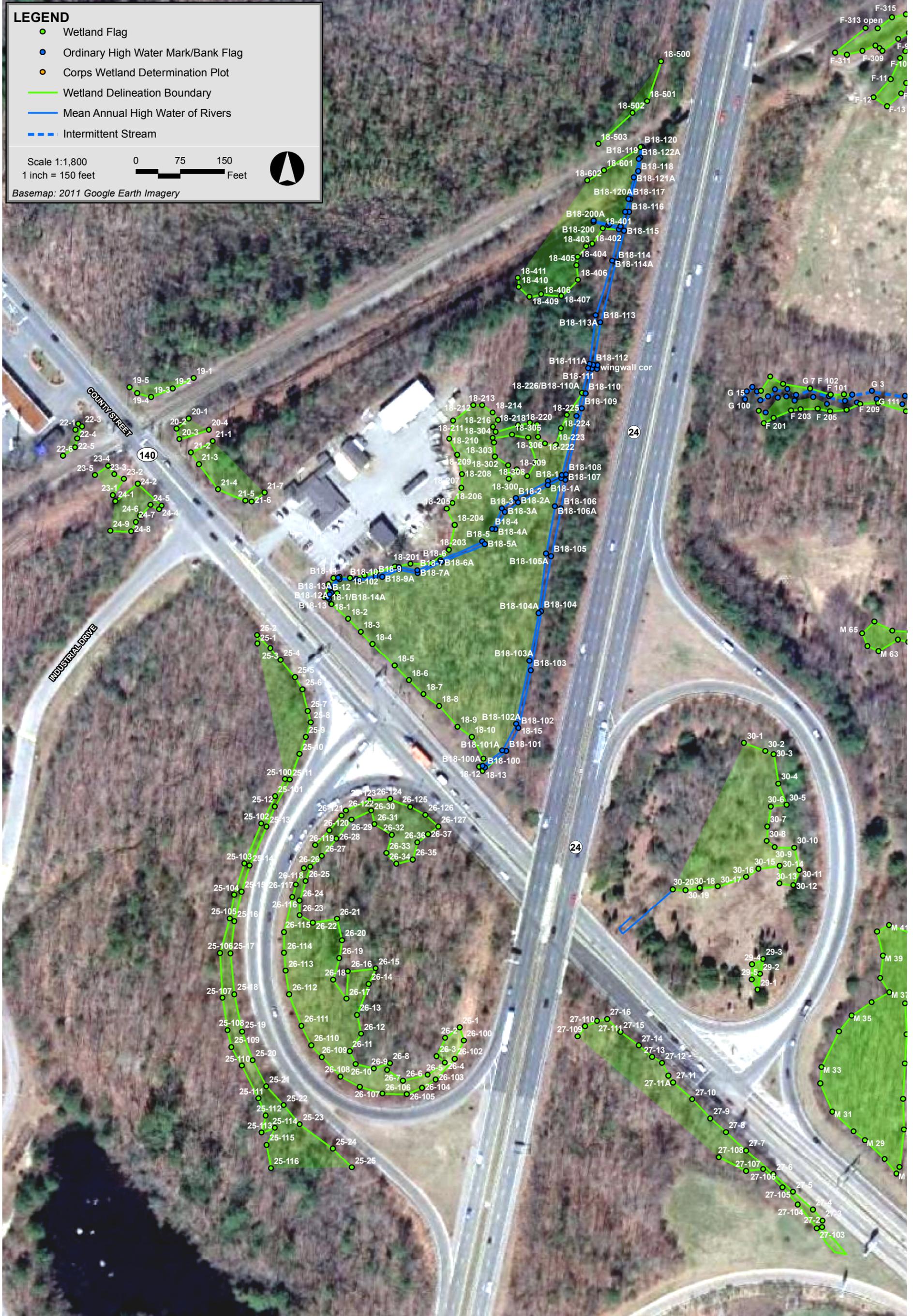
LEGEND

- Wetland Flag
- Ordinary High Water Mark/Bank Flag
- Corps Wetland Determination Plot
- Wetland Delineation Boundary
- Mean Annual High Water of Rivers
- Intermittent Stream

Scale 1:1,800
1 inch = 150 feet

0 75 150 Feet

Basemap: 2011 Google Earth Imagery



Appendix C-2
Wetlands Determination Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light (LIT parcel) City/County: Taunton, Bristol Sampling Date: 9/6/2012
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: 2-UPL
 Investigator(s): J. Fennell, A. Atwell Section, Township, Range: n/a
 Landform (hillslope, terrace, etc.): slight slope Local relief (concave, convex, none): convex Slope (%): 4
 Subregion (LRR or MLRA): R Lat: 41 52'14.72" N Long: 71 03' 04.39" W Datum: WGS 84
 Soil Map Unit Name: 245A - Hinckley Sandy Loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)
 Forested upland fringe bordering managed uplands, a stormwater pond berm, and paved road embankments. Upland may receive some overland flow from nearby embankments. Although wetland hydrology was evident at the time of survey, hydrophytic vegetation and hydric soils were absent. Data point UPL-2 is located adjacent to wetland flag AC-14.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	_____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>11</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 2-UPL

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus strobus</u>	<u>45</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>43%</u> (A/B)
2. <u>Acer rubrum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Quercus rubra</u>	<u>20</u>	<u>N</u>	<u>FACU</u>	
4. <u>Betula populifolia</u>	<u>15</u>	<u>N</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>110</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Nyssa sylvatica</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Viburnum dentatum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Pinus strobus</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Hamamelis virginiana</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. <u>Ilex verticillata</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
6. _____	_____	_____	_____	
7. <u>Quercus rubra</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
<u>80</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Dennstaedtia punctilobula</u>	<u>45</u>	<u>Y</u>	<u>UPL</u>	
2. <u>Aralia nudicalis</u>	<u>7</u>	<u>N</u>	<u>FACU</u>	
3. <u>Mitchella repens</u>	<u>3</u>	<u>N</u>	<u>FACU</u>	
4. <u>Dendrolycopodium obscurum</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Hamamelis virginiana</u>	<u>Trace</u>	<u>N</u>	<u>FACU</u>	
6. <u>Thelypteris noveboracensis**</u>	<u>Trace</u>	<u>N</u>	<u>FAC**</u>	
7. <u>Lindera benzoin</u>	<u>Trace</u>	<u>N</u>	<u>FACW</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>70</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

**Thelypteris noveboracensis, nor synonyms of this species (New York Fern) were found within the Northcentral-Northeast Region-NWPL Final Draft Ratings. Epsilon used the previous rating from REED, 1988 and looked up the indicator status for region 2, this indicator status is FAC.



Representative view of data plot UPL-2.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light (LIT parcel) City/County: Taunton, Bristol Sampling Date: 9/6/2012
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: 2-WET
 Investigator(s): J. Fennell, A. Atwell Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Hummocky Slope (%): 1-2%
 Subregion (LRR or MLRA): R Lat: 41 52' 15.33" N Long: 71 03' 05.06" W Datum: WGS 84
 Soil Map Unit Name: 245A - Hinckley Sandy Loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland Flag Series A</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p>Wetland is part of large wetland and stream complex associated with the Cotley River; wetland is characterized by hummocks, with several ATV trails running through area. Data point is located near Wetland Flag AC-15.</p>	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ <input checked="" type="checkbox"/> High Water Table (A2) _____ <input checked="" type="checkbox"/> Saturation (A3) _____ _____ Water Marks (B1) _____ _____ Sediment Deposits (B2) _____ _____ Drift Deposits (B3) _____ _____ Algal Mat or Crust (B4) _____ _____ Iron Deposits (B5) _____ _____ Inundation Visible on Aerial Imagery (B7) _____ _____ Sparsely Vegetated Concave Surface (B8) _____ _____ Water-Stained Leaves (B9) _____ _____ Aquatic Fauna (B13) _____ _____ Marl Deposits (B15) _____ _____ Hydrogen Sulfide Odor (C1) _____ _____ Oxidized Rhizospheres on Living Roots (C3) _____ _____ Presence of Reduced Iron (C4) _____ _____ Recent Iron Reduction in Tilled Soils (C6) _____ <input checked="" type="checkbox"/> Thin Muck Surface (C7) _____ _____ Other (Explain in Remarks) _____	Secondary Indicators (minimum of two required) _____ Surface Soil Cracks (B6) _____ _____ Drainage Patterns (B10) _____ _____ Moss Trim Lines (B16) _____ _____ Dry-Season Water Table (C2) _____ _____ Crayfish Burrows (C8) _____ _____ Saturation Visible on Aerial Imagery (C9) _____ _____ Stunted or Stressed Plants (D1) _____ _____ Geomorphic Position (D2) _____ _____ Shallow Aquitard (D3) _____ _____ Microtopographic Relief (D4) _____ <input checked="" type="checkbox"/> FAC-Neutral Test (D5) _____
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The presence of muck indicates long term saturation within this system. Primary indicators of hydrology were observed.

VEGETATION – Use scientific names of plants.

Sampling Point: 2-WET

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30' Radius</u>)					
1. <u>Acer rubrum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71%</u> (A/B)	
2. <u>Pinus strobus</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>		
3. <u>Carpinus carolinia</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>70</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15' Radius</u>)					
1. <u>Clethra alnifolia</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>		
2. <u>Carpinus carolinia</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>		
3. <u>Pinus strobus</u>	<u>10</u>	<u>N</u>	<u>FACU</u>		
4. <u>Acer rubrum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>		
5. <u>Ilex verticillata</u>	<u>1</u>	<u>N</u>	<u>FACW</u>		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
<u>86</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Herb Stratum (Plot size: <u>5' Radius</u>)					
1. _____	_____	_____	_____		
2. <u>Osmunda cinnamomea</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>		
3. <u>Aralia nudacalis</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>		
4. <u>Quercus rubra</u>	<u>1</u>	<u>N</u>	<u>FAC</u>		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>16</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
<u>0</u> = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: (Include photo numbers here or on a separate sheet.)

The presence of hydrophytic vegetation was confirmed using the dominance test.

SOIL

Sampling Point: 2-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1"	10 YR 2/1	100					Muck	
1-6"	10 YR 4/1	98	10 YR 5/2	2	C	M	Fine Sandy Loam	
6-16"	2.5 Y 5/2	95	2.5 Y 5/3	5	C	M	Loamy Sand	
16-20"	5 Y 6/1	92	2.5 Y 6/3	8	C	M	Loamy VF Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Representative view of data plot WET-2.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light (LIT parcel) City/County: Taunton, Bristol Sampling Date: 9/6/12
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: UPL-3
 Investigator(s): J. Fennell, A. Atwell Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): NONE Slope (%): 2
 Subregion (LRR or MLRA): R Lat: 41 52'27.91"N Long: 71 02'54.33" W Datum: WGS 84
 Soil Map Unit Name: Unadilla very fine sandy loam, 0-3% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) This data plot is located within a field that is likely managed (mowed). Data point UPL-3 is located adjacent to wetland flag D-334.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>18</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: UPL-3

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rosa multiflora</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>5</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Festuca rubra</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Secale cereale</u>	<u>40</u>	<u>Y</u>	<u>UPL</u>	
3. <u>Plantago major</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
4. <u>Galium mollugo</u>	<u>8</u>	<u>N</u>	<u>UPL</u>	
5. <u>Dactylis glomerata</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
6. <u>Rosa multiflora</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
7. <u>Erechtites hieraciifolius</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>115</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>

Remarks: (Include photo numbers here or on a separate sheet.)

Non-dominant plants are also not hydrophytic.

SOIL

Sampling Point: UPL-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/3	100					loamy sand	
8-15	10YR 5/2	70					Gr. loamy sand	Two matrix colors (likely from mixing)
	10YR 7/2	30						
15-20	2.5Y 6/3	80	2.5Y 5/1	20	C	M	Gravelly sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Representative view of UPL-3.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light (LIT parcel) City/County: Taunton, Bristol Sampling Date: 9/6/12
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: WET-3
 Investigator(s): J. Fennell, A. Atwell Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): NONE Slope (%): 2
 Subregion (LRR or MLRA): R Lat: 41 52' 29.10" N Long: 71 02' 53.27"W Datum: WGS 84
 Soil Map Unit Name: Unadilla very fine sandy loam, 0-3% slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: <u>D SERIES</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p>Wetland system is located within a field, has likely been managed (mowed). Wetland D contains an area of previously created mitigation wetlands. The data plot is not located within the mitigation area. Data plot is located adjacent to wetland flag D-333.</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>6</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: WET-3

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Fraxinus pennsylvanica</u>	<u>Trace</u>	<u>N</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>5</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Verbena hastata</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Juncus effusus</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Onoclea sensibilis</u>	<u>19</u>	<u>N</u>	<u>FACW</u>	
4. <u>Eutrochium maculatum</u>	<u>17</u>	<u>N</u>	<u>OBL</u>	
5. <u>Phalaris arundinacea</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
6. <u>Acer rubrum</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
7. <u>Lythrum salicaria</u>	<u>7</u>	<u>N</u>	<u>OBL</u>	
8. <u>Carex lurida</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
9. <u>Solidago gigantea</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>145</u>	= Total Cover		Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
Remarks: (Include photo numbers here or on a separate sheet.) Non-dominant plants are also predominantly hydrophytic.				



Representative view of WET-3.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light (LIT parcel) City/County: Taunton, Bristol Sampling Date: 9/6/2012
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: 5-UPL
 Investigator(s): J. Fennell, A. Atwell Section, Township, Range: n/a
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1-2%
 Subregion (LRR or MLRA): R Lat: 41 52'41.67" N Long: 71 02' 59.83" W Datum: WGS 84
 Soil Map Unit Name: 255A - Windsor Sandy Loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Forested area outside edge of wetland and located between Wetland N and Wetland J. Slight topographical relief. Data point 5-UPL is located between wetland flags N-21 and J-10.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 5-UPL

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus strobus</u>	<u>65</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>63</u> (A/B)
2. <u>Acer rubrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Quercus rubra</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
4. <u>Fagus grandifolia</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. _____				
6. _____				
7. _____				
	<u>100</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Pinus strobus</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Ilex verticillata</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
4. <u>Virburnum dentatum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
5. _____				
6. _____				
7. _____				
	<u>85</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Smilax rotundifolia</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Pinus strobus</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Osmunda regalis</u>	<u>2</u>	<u>N</u>	<u>OBL</u>	
4. <u>Ilex verticillata</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>22</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
	<u>0</u>	= Total Cover		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				



Representative view of data plot UPL-5.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light (LIT parcel) City/County: Taunton, Bristol Sampling Date: 9/6/2012
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: 5-WET
 Investigator(s): J. Fennell, A. Atwell Section, Township, Range: n/a
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 1-2%
 Subregion (LRR or MLRA): R Lat: N 41 52' 41.67" Long: 71 02' 59.83" W Datum: WGS 84
 Soil Map Unit Name: 255A - Windsor Sandy Loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland Flag Series N</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p>Forested wetland with hummocky topography in some sections and sparsely vegetated portions. Hydrology may be partially impounded by railroad embankment to south. Data plot is located adjacent to wetland flag N-19.</p>	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <u>X</u> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) <u>X</u> Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) <u>X</u> Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) <u>X</u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>18"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Many tree species within wetland exhibit buttressed root systems.

VEGETATION – Use scientific names of plants.

Sampling Point: 5-WET

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.3</u> (A/B)
2. <u>Pinus strobus</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Quercus rubra</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. <u>Nyssa sylvatica</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>45</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Ilex verticillata</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Virburnum dentatum</u>	<u>15</u>	<u>N</u>	<u>FAC</u>	
3. <u>Acer rubrum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. <u>Nyssa sylvatica</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
5. <u>Vaccinium corymbosum</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
<u>80</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Osmunda regalis</u>	<u>25</u>	<u>Y</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Osmunda cinnamomea</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Rubus hispidus</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
4. <u>Viburnum dentatum</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
5. <u>Maianthemum canadense</u>	<u>Trace</u>	<u>N</u>	<u>FACU</u>	
6. <u>Pinus strobus</u>	<u>Trace</u>	<u>N</u>	<u>FACU</u>	
7. <u>Quercus rubra</u>	<u>Trace</u>	<u>N</u>	<u>FACU</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>72</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: 5-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1"	10 YR 2.5/1	100					mmsl	Ag1 (mucky modified fine sandy loam)
1-7"	10 YR 2.5/1	98	10YR 4/3	2	C	M	f sandy loam	Ag2
7-15"	10 YR 3/1	92.5	10 YR 6/3	1.5	C	M	f sandy loam	Ag3
			10 YR 4/2	6	C	M		
15-16"	10YR 2/2	100					crs sndy loam	Bw1
16-20"	10YR 4/3	90	10YR 5/4	10	C	M	CRS SNDY LOAM	Bw2

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Soils show evidence of episaturation.



Representative view of data plot WET-5.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light City/County: Taunton Sampling Date: 11/6/12
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: 11-UPL
 Investigator(s): A. Atwell and S. Hale Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Convex Slope (%): 2-5%
 Subregion (LRR or MLRA): R Lat: 41°52'23.405"N Long: 71°3'22.876"W Datum: WGS 84
 Soil Map Unit Name: Udorthent NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Yes No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes Yes No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Plot location proximate to wetland flag 18-6	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: No indicators of hydrology observed.	

VEGETATION – Use scientific names of plants.

Sampling Point: 11-UPL

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus rubra</u>	<u>30</u>	Y	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>16%</u> (A/B)
2. <u>Quercus alba</u>	<u>20</u>	Y	FACU	
3. <u>Prunus serotina</u>	<u>20</u>	Y	FACU	
4. <u>Malus spp.</u>	<u>10</u>			
5. _____				
6. _____				
7. _____				
<u>80</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)				
1. <u>Rosa multiflora</u>	<u>35</u>	Y	FACU	
2. <u>Vaccinium corymbosum</u>	<u>10</u>			
3. <u>Viburnum dentatum</u>	<u>10</u>			
4. <u>Acer rubrum</u>	<u>10</u>			
5. _____				
6. _____				
7. _____				
<u>65</u> = Total Cover				
Herb Stratum (Plot size: <u>5 ft</u>)				
1. <u>Solidago spp.</u>	<u>50</u>	Y	unknown	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Smilax rotundifolia</u>	<u>20</u>	Y	FAC	
3. <u>Pinus strobus</u>	<u>10</u>		FACU	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>80</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
<u>0</u> = Total Cover				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				



Representative view of data plot UPL-11.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Light City/County: Taunton, Bristol Sampling Date: 11/6/12
 Applicant/Owner: Mashpee Wampanoag Tribe State: MA Sampling Point: 11-Wet
 Investigator(s): A. Atwell and S. Hale Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Concave, hummock Slope (%): 1-2%
 Subregion (LRR or MLRA): R Lat: 41°52'23.405"N Long: 71°3'22.876"W Datum: WGS 84
 Soil Map Unit Name: Scarboro mucky loamy fine sand NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Yes No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes Yes No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Plot proximate to wetland flag 18-8.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ <input checked="" type="checkbox"/> High Water Table (A2) _____ <input checked="" type="checkbox"/> Saturation (A3) _____ _____ Water Marks (B1) _____ _____ Sediment Deposits (B2) _____ _____ Drift Deposits (B3) _____ _____ Algal Mat or Crust (B4) _____ _____ Iron Deposits (B5) _____ _____ Inundation Visible on Aerial Imagery (B7) _____ _____ Sparsely Vegetated Concave Surface (B8) _____	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>approx. 6 inches</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>to surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 11-Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus rubra</u>	<u>50</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83%</u> (A/B)
2. <u>Acer rubrum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Quercus bicolor</u>	<u>10</u>		<u>FACW</u>	
4. <u>Carya glabra</u>	<u>10</u>		<u>FACU</u>	
5. <u>Carya ovata</u>	<u>10</u>		<u>FACU</u>	
6. _____				
7. _____				
	<u>100</u>			Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)				
1. <u>Carpinus caroliniana</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Vaccinium corymbosum</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Viburnum dentatum</u>	<u>10</u>		<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
	<u>60</u>			Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>5 ft</u>)				
1. <u>Osmunda cinnamomea</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Rubus hispidus</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Thelypteris noveboracensis</u>	<u>10</u>		<u>FAC</u>	
4. <u>Spiraea alba</u>	<u>5</u>		<u>FACW</u>	
5. <u>Vaccinium corymbosum</u>	<u>5</u>		<u>FACW</u>	
6. <u>Viburnum dentatum</u>	<u>5</u>		<u>FAC</u>	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>65</u>			
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
	<u>0</u>			
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: 11-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10 YR 2/1	100					F.S. Loam	mucky modified
1-3	10 YR 3/1	95					M. Loamy Sand	
			10 YR 3/3	5	C	M		
3-9	10 YR 4/2	83	10 YR 4/4	15	C	M	M. Loamy Sand	
			7.5 YR 4/6	2	C	M		
9-18	10 YR 5/2	92	7.5 YR 5/4	8	C	M	Loamy Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Representative view of data plot WET-11.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FIRST LIGHT CASINO-OFF-SITE City/County: TAUNTON/BRISTOL Sampling Date: 6/21/13
 Applicant/Owner: MASHPEE WAMPANOAG TRIBE State: MA Sampling Point: UP-1
 Investigator(s): J. FENNELL, S. HALE Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): NONE Slope (%): 2
 Subregion (LRR or MLRA): R Lat: 847271.05m N Long: 236885.33m E Datum: NAD 83
 Soil Map Unit Name: SCARBORO MUCKY LOAMY FINE SAND 0-3% SLOPE NWI classification: upl

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation n, Soil n, or Hydrology n significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation n, Soil n, or Hydrology n naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center">Forested area adjacent to bordering vegetated wetland to intermittent stream. Proximate to flag 18-409.</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: up-1

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>ACER RUBRUM</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. <u>PINUS STROBUS</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
<u>90</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>ACER RUBRUM</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
2. <u>HAMAMELIS VIRGINIANA</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Gaylussacia baccata</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
4. _____				
5. _____				
6. _____				
7. _____				
<u>80</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Maianthemum canadense</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Gaylussacia baccata</u>	<u>7.5</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Dendrolycopodium obscurum</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. <u>Trientalis borealis</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
5. <u>Smilax rotundifolia</u>	<u>2.5</u>	<u>N</u>	<u>FAC</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>30</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>NONE</u>				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes _____ No <u>X</u>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: up-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
1-0	10YR 2/1	100					HEMIC	ORGANIC DUFF
0-2	10YR 2/1	100					LOAM	
2-6	2.5 Y 3/1	97	10YR 2/1	3	MS	M	LOAMY SAND	
6-20	10YR 5/6	100					SAND	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:



Representative view of data plot UPL-1, 18 – Series BVW.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FIRST LIGHT CASINO-OFF-SITE City/County: TAUNTON/BRISTOL Sampling Date: 6/21/13
 Applicant/Owner: MASHPEE WAMPANOAG TRIBE State: MA Sampling Point: WET-1
 Investigator(s): J.FENNEL, S.HALE Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): NONE Slope (%): 2
 Subregion (LRR or MLRA): R Lat: 847280.55mN Long: 236884.95mE Datum: NAD83
 Soil Map Unit Name: SCARBORO MUCKY LOAMY FINE SAND 0-3% SLOPES NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>SERIES 18-400</u>
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center">NEAR FLAG 18-409. FLOODPLAIN AREA BORDERED BY INTERMITTENT STREAMS, A RAILROAD, MAJOR HIGHWAYS, A MASSDOT MAINTENANCE FACILITY, AND TRANSMISSION LINE ROW.</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <u>X</u> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: WET-1

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>ACER RUBRUM</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71</u> (A/B)
2. <u>PINUS STROBUS</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
<u>90</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>ACER RUBRUM</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. <u>VIBURNUM DENTATUM</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
3. <u>CLETHRA ALNIFOLIA</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
4. <u>Gaylussacia baccata</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. _____				
6. _____				
7. _____				
<u>45</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>OSMUNDA CINNAMOMEA</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Parathelypteris noveboracensis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Dennstaedtia punctilobula</u>	<u>5</u>	<u>N</u>	<u>UPL</u>	
4. <u>Maianthemum canadense</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. <u>Smilax rotundifolia</u>	<u>2.5</u>	<u>N</u>	<u>FAC</u>	
6. <u>Gaylussacia baccata</u>	<u>2.5</u>	<u>N</u>	<u>FACU</u>	
7. <u>Aralia nudicaulis</u>	<u>2.5</u>	<u>N</u>	<u>FACU</u>	
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>47.5</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>NONE</u>				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: WET-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
1-0	10YR 2/1	100					HEMIC	DUFF MATERIAL
0-4	10YR 4/1	95	10YR 2/1	5	MS	M	LOAMY	SAND
4-12	10YR 5/1	90	10YR 5/6	5	C	M	SANDY	LOAM
	10YR 2/1	5						
12-20+	10YR 6/2	85	10YR 5/3	15	C	M	sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Representative view of data plot WET-1, 18 – Series BVW.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FIRST LIGHT CASINO City/County: TAUNTON/BRISTOL Sampling Date: 6/21/13
 Applicant/Owner: MASHPEE WAMPANOAG TRIBE State: MA Sampling Point: UP-2
 Investigator(s): J. FENNELL, S.HALE Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): NONE Slope (%): 2
 Subregion (LRR or MLRA): R Lat: 847207.5mN Long: 236895.56mE Datum: NAD83
 Soil Map Unit Name: SCARBORO MUCKY LOAMY FINE SAND 0-3% SLOPES NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center">Upland area adjacent to wetland dominated by facultative vegetation characteristic of area.</p>	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: UP-2

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71</u> (A/B)
2. <u>PINUS STROBUS</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
3. <u>QUERCUS ALBA</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. <u>QUERCUS RUBRA</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>90</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>CLETHRA ALNIFOLIA</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. <u>HAMAMELIS VIRGINIANA</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>50</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>SMILAX ROTUNDIFOLIA</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>CLETHRA ALNIFOLIA</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Maianthemum canadense</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>80</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>SMILAX ROTUNDIFOLIA</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>40</u> = Total Cover				
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

Remarks: (Include photo numbers here or on a separate sheet.)



Representative view of data plot UPL-2, 18 – Series BVW.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FIRST LIGHT CASINO-OFF-SITE City/County: TAUNTON/BRISTOL Sampling Date: 6/21/13
 Applicant/Owner: MASHPEE WAMPANOAG TRIBE State: MA Sampling Point: WET-2
 Investigator(s): J.FENNEL, S.HALE Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): FLOODPLAIN Local relief (concave, convex, none): NONE Slope (%): 2
 Subregion (LRR or MLRA): R Lat: 847188.98m N Long: 236897.13m E Datum: NAD83
 Soil Map Unit Name: SCARBORO MUCKY FINE SANDY LOAM 0-3% SLOPES NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) <u>X</u> Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <u>X</u> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>13</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>8</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: WET-2

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>ACER RUBRUM</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71</u> (A/B)
2. <u>QUERCUS RUBRA</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>QUERCUS ALBA</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. _____				
5. _____				
6. _____				
7. _____				
<u>100</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>VACCINIUM CORYMBOSUM</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	
2. <u>ACER RUBRUM</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
<u>45</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>OSMUNDA CINNAMOMEA</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Glyceria canadensis</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Symplocarpus foetidus</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
4. <u>Toxicodendron radicans</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
5. <u>Thelypteris palustris</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>50</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
1. <u>NONE</u>				
2. _____				
3. _____				
4. _____				
<u>0</u> = Total Cover				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				

Remarks: (Include photo numbers here or on a separate sheet.)

TREE SPECIES LIVING ON HUMMOCKS WITHIN WETLAND

SOIL

Sampling Point: WET-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					MUCKY MODIFIED LOAM	
2-6	10YR 6/1	95	10YR 2/1	5	MS	M	LOAMY SAND	
6-20+	10YR 5/2	90	10YR 5/6	10	C	M	SAND	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:



Representative view of data plot WET-2, 18 – Series BVW.

Appendix C-3
Functions and Values Assessment



Wetland Functions and Values Assessment
Mashpee Wampanoag Tribe
First Light Casino Project
Taunton, Massachusetts

NAE File No. 2012-01239

June 2013

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Functions and Values Assessment Report

1.0 INTRODUCTION AND PURPOSE

Epsilon Associates, Inc. has prepared this Wetlands and Functions Values Assessment (the "Assessment") for submittal to the Regulatory Division of the U.S. Army Corps of Engineers, New England District ("USACE"). The Mashpee Wampanoag Tribe ("MWT"), a federally recognized tribe, is proposing that land be taken into trust in the City of Taunton, Massachusetts by the U.S. Department of Interior Bureau of Indian Affairs ("BIA"). The lands in Taunton would be used to meet the Tribe's economic needs through construction of a destination resort casino. The resort casino is referred to herein as "First Light". The land proposed to be taken into Trust in Taunton comprises approximately 151 acres located within and adjacent to the Liberty & Union Industrial Park ("LUIP"). The LUIP is a commercial/industrial development park created in 2003 and operated by the private, non-profit Taunton Development Corporation ("TDC") for the purpose of generating economic development in the City of Taunton. The project site is generally bounded to the north by Middleborough Avenue, which is residential; to the east by Stevens Street, which is residential and commercial; to the south by Route 140; and to the west by Route 24. Both Routes 140 and 24 are limited access highways. The site is accessed via Stevens Street off of Exit 11 of Route 140. O'Connell Way, off of Stevens Street, provides access to the interior of the site. Figure 1-1 shows the location of the land in Taunton.

The proposed First Light casino may result in permanent and temporary impacts to wetlands and other Waters of the United States. The USACE's Section 404 Clean Water Act regulations and guidelines require an evaluation of wetland functions and values as part of the permit application review process. The Assessment undertaken by Epsilon was developed to provide guidance on wetland functions which could be impacted under prospective development scenarios. This Assessment will be used as part of wetland impact mitigation design and planning. By identifying the important functions and values attributed to a wetland or wetland system through examination of wetland characteristics and those of its surrounding watershed, a determination of wetland functional/value loss resulting from a project's impacts may be determined. This determination then allows for appropriate wetland function and value loss compensation as part of project impact mitigation planning.

The study area locations on the project site where data was collected for the Assessment are provided on Figure 1-2. A summary of the Functions and Values assessment conducted by Epsilon is provided in Section 3.0 with more detailed data provided in Attachment A. Representative wetland photographs at the data collection points are provided in Attachment B. Wildlife and vegetation diversity abundance lists are provided in Attachment C.





2.0 DESCRIPTION OF WATERS OF THE U.S.

During the months of September, October, November 2012 and June 2013 professional wetland scientists and certified soil scientists from Epsilon delineated wetlands¹ and other waters of the U.S.² on the LIT Site and offsite locations where roadway improvement measures are proposed. The delineation work was conducted in accordance with the USACE 1987 Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0 (January 2012).³

On November 8, 2012, a representative from the USACE inspected sections of the proposed wetland boundaries on the LIT Site. No changes were made to the wetland lines as a result of this initial evaluation. The project proponent will provide the USACE with a detailed wetland delineation report as part of the Section 404 and Preliminary Jurisdictional Determination review processes. The delineated wetland boundaries are depicted on Figure 2-1, Waters of the U.S. (Wetland Series 1 through 11).

¹ According to 33 C.F.R. § 328.3(b), wetlands means “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.”

² “Waters of the United States” is broadly defined in the federal regulations that implement the Clean Water Act. It includes tidal waters, rivers, streams, lakes, ponds and wetlands. 33 C.F.R. § 328.3(a).

³ Wetland resource areas were also delineated in accordance with the Massachusetts Department of Environmental Protection’s handbook, “Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act” (MassDEP, 1995); and the local Taunton Conservation Commission Wetlands Ordinance (City of Taunton Ordinances, Chapter 16, Section 30-38). A discussion of local and state regulated resource areas will be presented in the separate Draft Environmental Impact Report (“DEIR”) as required by the Massachusetts Environmental Policy Act (“MEPA”) and implementing regulations (301 CMR 11.00).

LEGEND

- Project Site
- 1 Wetland Delineation Boundary (Wetland ID)¹
- Ordinary High Water Mark (OHWM)
- Intermittent Stream

Scale 1:4,800
 1 inch = 400 feet

0 200 400
 Feet



Basemap: 2011 Google Earth Imagery



NOTE:
 1. During the months of September, October and November 2012, and June 2013, professional wetland scientists and certified soil scientists from Epsilon Associates delineated wetlands and other waters of the U.S. on the Project Site and offsite locations where roadway and intersection improvement measures are proposed.

Table 2.1-1 below presents a summary of the delineated wetlands and waters of the U.S. on the LIT Site (Wetland Series 1 through 9) and in the vicinity of the Route 24/140 interchange (Wetland Series 10) and Stevens Street/Route 140 interchange (Wetland Series 11). It is assumed that all of the delineated wetlands and streams are jurisdictional “waters of the U.S.” for the purposes of Sections 401 and 404 of the U.S. Clean Water Act. The delineated wetlands and other waters of the U.S. were categorized to a subsystem or class level according to the U. S. Fish & Wildlife Service (“USFWS”) Classification of Wetlands and Deepwater Habitats of the United States (the “Cowardin Approach”)⁴. The USFWS System broadly defines wetland types by hydrology and vegetative cover. Wetlands are categorized within a classification hierarchy of Systems, Subsystems, and Classes. Using the Cowardin approach, the wetland systems identified within the study area include predominantly Riverine Lower Perennial Unconsolidated Bottom (“UB”), Riverine Intermittent Streambed and Palustrine Forested Wetlands (“PFO”), Palustrine Scrub-Shrub Wetlands (“PSS”), Palustrine Emergent Wetlands (“PEM”) and Lacustrine Littoral/Limnetic wetlands are also present to a lesser degree.

Table 2.1-1 Waters of the U.S. Descriptions

Wetland Series ID	Cowardin Classification	General Description of Delineated Waters of the U.S.
1	PEM	This isolated vegetated wetland (IVW) occurs in a shallow topographic depression dominated by cattail, beggar-ticks, soft rush, spike rush and lurid sedge. Primary hydrologic input derived from groundwater discharge, surface runoff and precipitation. Periodically contains standing water.
2	Riverine Lower Perennial UB (Cotley River), Riverine Intermittent Streambed, PFO, PSS	Gently sloping wetland complex consisting of the Cotley River and three intermittent streams / tributaries. Vegetated wetlands primarily consisting of forest communities are contiguous to these surface waters, and are dominated by red maple and yellow birch in the overstory. The understory and ground cover species consist of ironwood, arrowwood, sweet pepperbush, cinnamon fern and sensitive fern. For the most part, hydrologic input is derived from upstream watersheds/drainage areas, groundwater discharge, surface runoff and precipitation.
3	Riverine Intermittent Streambed, PFO, PSS, PEM	Topographically flat to gently sloping wetlands contiguous to two intermittent streams. The eastern portion of this wetland complex is dominated by forested wetlands with representative canopy species including red maple, swamp white oak, white pine and red oak. Understory and groundcover species consist of ironwood, spicebush, arrowwood, and marsh fern. The western portion of Wetland 3 primarily consists of emergent wetlands, with the most abundant species including cattail, purple vervain, soft rush, wool grass, sensitive fern and lurid sedge. Throughout this wetland complex, hydrologic input is derived from groundwater discharge, surface runoff and precipitation.

⁴ Cowardin, L. et al. (1979). Classification of Wetlands and Deepwater Habitats of the United States, United States Fish and Wildlife Service, Biological Services Program, Washington, D.C., FWS/OBS-79/31.

Table 2.1-1 Waters of the U.S. Descriptions (continued)

4	Riverine Lower Perennial UB (Cotley River), Lacustrine (Barstow's Pond) PFO,PEM	Gently sloping wetland complex consisting of the Cotley River and Barstows Pond. Vegetated wetlands primarily consisting of narrow bands of forest and emergent communities are contiguous to these surface waters. Collectively, these wetlands are dominated by red maple arrowwood, sweet pepperbush, cattail, tussock sedge and wild rice. For the most part, hydrologic input is derived from upstream watersheds/drainage areas, groundwater discharge, surface runoff and precipitation.
5 & 6	PFO	These pocket wetlands are isolated in the landscape and occur in topographic depressions. In each, the vegetative community is dominated by red maple in the overstory, with understory species including winterberry, highbush blueberry and arrowwood of varying densities. Evidence of periodic standing water (stains/marks on trees) was observed. Hydrologic input is limited to groundwater discharge, surface runoff and precipitation.
7	PSS	This pocket wetland is isolated in the landscape and occurs in a topographic depression. The central portion of the wetland is dominated by buttonbush, with standing water present throughout. Peripheral portions of the wetland primarily include silky dogwood, winterberry, highbush blueberry and arrowwood. Based on site-specific observations, this wetland functions as a vernal pool breeding habitat for wood frog and spotted salamander. Hydrologic input is limited to groundwater discharge, surface runoff and precipitation.
8	PFO	This wetland is isolated in the landscape and occurs in a topographic depression similar to Wetlands 5, 6 and 7 described above. Plant species, while sparse, primarily include winterberry, arrowwood and highbush blueberry. Like Wetlands 1, 5, 6 and 7, hydrologic input is limited to groundwater discharge, surface runoff and precipitation.
9	PEM	This small pocket wetland occurs in a shallow topographic depression dominated by cattail. Primary hydrologic input is derived from surface runoff and precipitation. Periodically contains standing water over rock / dense gravels.
10	Riverine Intermittent Streambed, PFO, PSS, PEM	This wetland system is located at the Route 24/Route 140 interchange and consists of vegetated wetlands, pockets of standing water and drainage ditches associated with existing roadway stormwater management systems. Primary hydrologic inputs include stormwater runoff and overland flows. Dominant wetland vegetation includes common reed, red maple, highbush blueberry and sweet pepperbush.
11	Riverine Lower Perennial UB (Cotley River), Riverine Intermittent Streambed, PFO, PSS, PEM	This wetland complex is centered at the Route 140/Stevens Street interchange and consists of vegetated wetlands, pockets of standing water and drainage ditches associated with existing roadway stormwater management systems. It also includes the southern extent of the Cotley River within the Study Area. Primary hydrologic inputs include stormwater and surface runoff. Dominant wetland vegetation includes common reed, red maple and a variety of wetland shrub species.

3.0 WETLANDS FUNCTIONS AND VALUES ASSESSMENT

Representative wetland habitats in the vicinity of potential impact areas were evaluated using the USACE *“Highway Methodology Workbook Supplement for Wetlands Functions and Values: A Descriptive Approach”*. This method incorporates both wetland science and human judgment of values. More specifically, functions are self sustaining properties of a wetland ecosystem that exist in the absence of society. They relate to the ecological significance of wetland properties without regard to subjective human values. Values are benefits that derive from either one or more functions and the physical characteristics associated with a wetland. The value of a particular wetland function, or combination thereof, is based on human judgment of the worth, merit, quality, or importance attributed to those functions. Functions and values can be “principal” if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society or from a local, regional, and/or national perspective. The 13 functions and values considered by the USACE Methodology include the following:

Functions:

1. Ground Water Recharge/Discharge
2. Floodflow Alteration (Storage & Desynchronization)
3. Fish and Shellfish Habitat
4. Sediment/Toxicant/Pathogen Retention
5. Nutrient Removal/Retention/Transformation
6. Production Export
7. Sediment/Shoreline Stabilization
8. Wildlife Habitat

Values:

9. Recreation
10. Educational/Scientific Value
11. Uniqueness/Heritage
12. Visual Quality/Aesthetics
13. Threatened or Endangered Species Habitat

The wetland areas evaluated for this report include six discrete locations within wetland 2, a discrete location within wetland 4, a discrete location within wetland 10 and three other wetland depressions identified as wetlands 5, 8, and 9. The project site includes a variety of wetland cover types including palustrine, forested, scrub-shrub, and emergent wetlands. Portions of wetland 2 include palustrine, forested wetlands and scrub-shrub that are located up-gradient of streams or abutting intermittent or perennial streams (the Cotley River).

Portions of wetland 4 include palustrine, forested wetlands. Wetlands 5 and 8 are also palustrine forested wetlands. Wetland 9 is a palustrine emergent wetland. Wetland 10 contains palustrine forested, scrub-shrub and emergent wetlands. These wetland systems, except for wetland 9, are naturally occurring.

3.1 Evaluation of Wetland Functions

3.1.1 *Ground Water Recharge/Discharge*

Wetlands can either recharge groundwater with surface water or discharge groundwater to surface waters. Wetlands receiving inflow from groundwater are known as discharging wetlands because water flows or discharges from the groundwater to the wetland. Discharge of groundwater maintains base flows in waterways. A recharge wetland refers to the reverse case where water flows from the wetland to the groundwater. The naturally-occurring wetlands evaluated by Epsilon function primarily as discharge wetlands. The ability of wetlands to function as recharge areas is limited given the presence of a seasonally high groundwater table throughout the Project area. Wetlands 2 and 4 that abut the Cotley River interact directly with the discharge entering Barstow's Pond. Wetland 9 does not affect recharge or discharge. This wetland holds precipitation over rock/ tight gravel/cobble until evapotranspiration depletes the water resource. Wetland 10 is associated with several intermittent watercourses and shows signs of variable water levels indicating it functions as primarily a discharge area.

3.1.2 *Floodflow Alteration (Storage & Desynchronization)*

This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events. Wetlands attenuate flooding by slowing and storing floodwaters, thereby diminishing the effects of flooding by gradually releasing floodwaters after the peak flood has passed. Trees and other wetland vegetation help slow the speed of flood waters. The effectiveness of wetlands for flood abatement may vary, depending on the size of the area, type and condition of vegetation, slope, the juxtaposition of the wetland in the floodplain and the saturation of wetland soils before flooding. The portions of the wetlands that were evaluated are primarily edges located within larger wetland systems. Wetlands 2 and 4 are located within mapped floodplain and likely provide water storage during periods of seasonal flooding. However, slopes may occur within the discrete areas evaluated that may diminish the capacity for that particular area of the wetland to function as floodflow storage. These wetlands also have varying degrees of plant community structure that could slow velocity of floodwaters and reduce the risk of downstream flash-flooding. In addition, depressional wetlands, particularly Wetland 8, collect precipitation and runoff, and can provide limited flood storage.

3.1.3 Fish and Shellfish Habitat

This function considers the effectiveness of seasonal or permanent waterbodies associated with the wetlands in question for fish and shellfish habitat. The Cotley River located within the study area is likely to provide food and habitat for warmwater fish species. Wetlands bordering the Cotley River can provide cover and shade, and enhance water quality, for fish. However, none of the discrete wetland resource areas reviewed as part of this assessment provide habitat directly to fish. These areas are located on the up-gradient portions within these wetlands. Additionally, seasonal, or intermittent streams are not likely to provide suitable fisheries habitat due to their temporal nature, warm temperatures, and lack of deep water refuge during dry periods.

3.1.4 Sediment/Toxicant/Pathogen Retention

This function reduces or prevents degradation of water quality. Wetlands maintain and improve water quality by trapping nutrients, sediments, and contaminants. Wetlands directly associated with water courses have greater opportunity to retain sediment, nutrients, and contaminants. Given the location where these assessments occurred within the wetland (up-gradient) wetlands edges are broad and intermittently aerobic, providing the appropriate type of microbial cycling to remove pollutants. Some of the wetland areas located adjacent to paved roads and areas of industrial use. These wetlands, including those areas located within Wetland 2 and Wetland 10, may function as traps for stormwater runoff containing road sand and salt, as well as potential toxicants from vehicle traffic.

3.1.5 Nutrient Removal/Retention/Transformation

This function relates to the effectiveness of a wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries. This function also considers the effectiveness of wetlands as a trap for nutrients in runoff from adjacent uplands or other wetlands as well as the ability of the wetland to process these nutrients into other forms. It is well documented that the biological and chemical processes of nitrification/denitrification in the nitrogen cycle can transform and thus remove nitrogen entering wetlands. Wetland plants also play an important role in the removal of phosphorous. Phosphorous has a sediment cycle with excess phosphorous being tied up in sediments, peat in organic soils and clay particles in mineral soils. Many of the wetlands identified within this report border parking lots or roadways. The southern portion of the LIT Site is actively maintained as an industrial park and fertilizer is likely used on landscaped areas. Wetlands receiving surface runoff can function as traps or sinks for nutrients. Certain woody vegetation is particularly effective at retaining nutrients over time.

3.1.6 Production Export

This function relates to the effectiveness of the wetland to produce food or usable products for humans or other living organisms. Factors to be considered include the presence of wildlife food sources and evidence of wildlife use, if high vegetation density is present, and

if a wetland exhibits a high degree of plant community structure/species diversity. The forested and scrub shrub wetlands within the LIT Site provide food sources (e.g. hard mast, berries) for a variety of wildlife species. Many of the wetlands exhibited signs of wildlife usage. However, there are not economic usable products in a high enough concentration to be economically or commercially viable.

3.1.7 *Sediment/Shoreline Stabilization*

This function relates to the effectiveness of a wetland to stabilize or anchor stream banks and shorelines against erosion. Dense wetland vegetation intercepts precipitation, preventing soil loosening and erosion. The “roughness” of dense vegetation can also slow down river flows during high water events. The riparian wetlands within the LIT Site can provide this function as vegetation stabilizes stream banks and reduces erosion. Overall, wetland areas outside of those discrete areas that could be potentially impacted by the project provide greater stabilization function.

3.1.8 *Wildlife Habitat*

This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Generally, several of the wetlands are mosaics of wetland cover types (e.g. forested, shrub, emergent) and therefore exhibit a high degree of interspersed vegetation classes and plant diversity and plant community structure good for a variety of generalist wildlife species. Additionally, one wetland located on the LIT Site functions as a vernal pool providing habitat to obligate vernal pool species (Wetland Series 7 north of the railroad tracks). Wetlands identified within the discrete locations where potential impacts could occur also provide habitat to generalist wildlife species. There was evidence of wildlife utilization within the wetlands and the uplands located within the site. Some of these species included higher tropic level species. Wetland Series 9 provided no evidence of wildlife or avian utilization. While Wetlands 2, 4, and 10 provided many examples of wildlife utilization including tracks, scat, and foraging evidence.

3.2 Evaluation of Wetland Values

3.2.1 *Recreation*

This value considers the effectiveness of the wetland and associated water-courses to provide recreational opportunities such as canoeing, boating, fishing, hunting, and other active or passive recreational activities. The LIT Site is located within private property and the privately owned Liberty and Union Industrial Park. One deer stand was located on the parcel but was located within uplands. Barstow’s Pond is deep enough to accommodate a canoe, although the pond is located on private lands. These wetlands do not provide direct recreational value to the community.

3.2.2 Educational/Scientific Value

This value considers the effectiveness of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research. The LIT Site is located entirely on private lands. Should the site be open to the public in the future, the educational or scientific value of these wetlands could be re-assessed.

3.2.3 Uniqueness/Heritage

This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. Wetlands located within the majority of the LIT Site are surrounded by urban land or highways. Wetlands directly associated with the Cotley River present desirable viewing opportunities, such as the ability to view multiple cover types or water resources, are present to varying degrees within the LIT Site. The Cotley River is hydrologically connected to the Taunton River which has been designated a Federal Wild and Scenic River, as designated by Congress and protected under U.S. Department of Interior regulations. Archaeological investigations are currently being performed at the Site. Unique features or heritage characteristics that have been discovered could be attributed to the Cotley River and surrounding environs.

3.2.4 Visual Quality/Aesthetics

The visual quality and aesthetic value of a wetland is dependent on available views or vistas of a variety of wetland cover types and surface water regimes. Views with open vistas are generally appealing to recreational observers. Due to the developed nature of the Site and the surrounding forested areas the only potentially unique views are found in association with the early successional upland fields and wetland and floodplain systems associated with the Cotley River north of the railroad tracks. The LIT Site is heavily developed south of the railroad tracks resulting in fragmented wetland systems and limited view sheds.

3.2.5 Threatened or Endangered Species Habitat

This value relates to the effectiveness of the wetland or associated waterbodies to support threatened or endangered species. No federal or state threatened or endangered species are known to occur within the LIT Site.

4.0 CONCLUSIONS

Functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society or from a local, regional, and/or national perspective. The principal functions of wetlands within the study area vary and include: **groundwater discharge/recharge, floodflow alteration, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, and wildlife habitat.** A more specific summary is provided on the following table relative to each wetland system where data used in this Assessment was collected.

Table 4.1-1 Summary of Principal Functions and Values

Wetland Series & Data Collection Point	Principal Functions and Values												
	Groundwater Recharge/Discharge	Floodflow Alteration	Fish and Shellfish Habitat	Sediment/Toxicant/Pathogen Retention	Nutrient Removal	Production Export	Sediment Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Threatened or Endangered Species Habitat
<i>Wetland Series 2</i>													
2a	•	•		•	•								
2b	•			•				•					
2c	•	•						•					
2d	•	•		•		•		•					
2e	•	•						•					
2f	•	•		•	•		•	•					
<i>Wetland Series 4</i>													
4	•	•		•	•		•	•			•		
<i>Wetland Series 5</i>													
5	•							•					
<i>Wetland Series 8</i>													
8	•	•											
<i>Wetland Series 9</i>													
9	No Principal Functions or Values Identified for Wetland Series 9												
<i>Wetland Series 10</i>													
10				•				•					

Attachment A

Wetland Functions & Values Field Evaluation Forms

Wetland Function-Value Evaluation Form

Total area of wetland 27.79 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No
 Access road, railroad track,
 Adjacent land use field, building Distance to nearest roadway or other development 60 ft.
 Dominant wetland systems present PSS1E, PFO1E Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid-system
 How many tributaries contribute to the wetland? 2+ Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 2a*
 Latitude 41.8762 Longitude -71.0528
 Prepared by: ABA/SDH Date 10/31/12
 Wetland Impact:
 Type PSS/ PFO Area ~ 528 sq ft/
~ 73 sq ft
 Evaluation based on:
 Office X Field X
 Corps manual wetland delineation
 completed? Y X N _____

Function/Value	Suitability Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	X	4,5,7,8,15	X	Wetland is associated, in part, with the Cotley River
 Floodflow Alteration	X	5,6,9,13,15	X	
 Fish and Shellfish Habitat		X 4,7		Wetland is on fringe of larger wetland system that may support fish populations.
 Sediment/Toxicant Retention	X	1,7,10	X	Portion of wetland is constricted outlet for pond
 Nutrient Removal	X	3,4,10,11	X	
 Production Export	X	1,10,12		
 Sediment/Shoreline Stabilization	X	1,2,6,7,9,13		
 Wildlife Habitat	X	6,7,8, 17		
 Recreation		X N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X N/A		
 Uniqueness/Heritage		X 1,12,14,22,30		Wetland is associated with the Cotley River, which is a tributary to the Taunton River, a Federal W&S River.
 Visual Quality/Aesthetics		X N/A		
ES Endangered Species Habitat		X N/A		
Other				

Notes: * Refer to backup list of numbered considerations.
 * Wetland 2a corresponds to wetland flag numbers wf f-3k to wf 4-7, F-303 to F-5 and F-1 to F-3c, and F-11 to F-6

Wetland Function-Value Evaluation Form

Total area of wetland 27.79 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Access road, Route 24, & field Distance to nearest roadway or other development 300 ft.

Dominant wetland systems present PFO1E & stream (R42G) Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid-system

How many tributaries contribute to the wetland? 2+ Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 2b*

Latitude 41.8744 Longitude -71.0537

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
Type PFO Area ~ 171 sq.ft

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
	Y	N			
 Groundwater Recharge/Discharge	X		4,5,7,8,15	X	Wetland is adjacent to stream leading from culvert under Rt 24 and leads to Cotley River system.
 Floodflow Alteration	X		5,6,7,9,13		Wetland is associated with intermittent stream and is very narrow.
 Fish and Shellfish Habitat		X	8,17		Wetland & stream empty to a shallow, diffuse wetland associated with the Cotley River.
 Sediment/Toxicant Retention	X		1,2,7,10	X	Wetland & stream are fed by highway culvert and runoff
 Nutrient Removal	X		4,10		
 Production Export	X		1,10		
 Sediment/Shoreline Stabilization	X		1,4,6,9		
 Wildlife Habitat	X		6,7,8,17	X	Raccoon tracks were observed.
 Recreation		X	N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X	N/A		
 Uniqueness/Heritage		X	1,22,30		Wetland is located within a trib of the Cotley River, which is a trib to the Taunton River.
 Visual Quality/Aesthetics		X	N/A		
ES Endangered Species Habitat		X	N/A		
Other					

Notes: * Refer to backup list of numbered considerations.
* Wetland 2b corresponds to wetland flag numbers F-205 to F-211 and G-2 to G-6/F-101

Wetland Function-Value Evaluation Form

Total area of wetland 27.79 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Access road, Route 24, forest

Adjacent land use & field Distance to nearest roadway or other development 150 ft.

Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? High

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 2c*

Latitude 41.8734 Longitude -71.0535

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
Type PFO Area ~ 1575 sq ft

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	X		4, 5, 8, 15	X	Wetland leads to the Cotley River system.
 Floodflow Alteration	X		2, 5, 6, 7, 9	X	
 Fish and Shellfish Habitat		X	N/A		Wetland flows into the Cotley River.
 Sediment/Toxicant Retention	X		1, 7		
 Nutrient Removal	X		4, 10		
 Production Export	X		1		
 Sediment/Shoreline Stabilization	X		1		
 Wildlife Habitat	X		6, 7, 8, 17	X	
 Recreation		X	N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X	N/A		
 Uniqueness/Heritage		X	1, 22, 30		Wetland is hydrologically connected to the Taunton River.
 Visual Quality/Aesthetics		X	N/A		
ES Endangered Species Habitat		X	N/A		
Other					

Notes: * Wetland 2c corresponds to wetland flag numbers F-220 to M-60

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 27.79 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Industrial park road & field Distance to nearest roadway or other development 60 ft.

Dominant wetland systems present PFO1E & stream (R42G) Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid-basin

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 2d*

Latitude 41.8729 Longitude -71.0493

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
Type PFO Area ~ 526 sq ft

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	X		4, 5, 7, 15	X	Wetland leads to the Cotley River system.
 Floodflow Alteration	X		5, 6, 7, 8, 9, 13	X	
 Fish and Shellfish Habitat		X	4, 8, 15, 16, 17		Wetland ultimately flows into the Cotley River via shallow and diffuse channel flow.
 Sediment/Toxicant Retention	X		1, 7, 10		
 Nutrient Removal	X		3, 4, 10, 11		
 Production Export	X		1, 2, 4, 5, 10, 12	X	
 Sediment/Shoreline Stabilization	X		1, 2, 3, 4, 6, 7, 9	X	
 Wildlife Habitat	X		5, 6, 7, 8, 17	X	
 Recreation		X	N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X	N/A		
 Uniqueness/Heritage		X	1, 19, 30		Wetland is hydrologically connected to the Taunton River.
 Visual Quality/Aesthetics		X	N/A		
ES Endangered Species Habitat		X	N/A		
Other					

Notes: * Refer to backup list of numbered considerations.
* Wetland 2d corresponds to wetland flag numbers A-334 to A-339 and A-810 to A-814.

Wetland Function-Value Evaluation Form

Total area of wetland 27.79 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Industrial park & road Distance to nearest roadway or other development 10 ft.

Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid-basin

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 2e*

Latitude 41.8691 Longitude -71.0494

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
Type PFO Area ~100 sq.ft

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
	Y	N			
 Groundwater Recharge/Discharge	X		4, 5, 7, 15	X	Wetland leads to the Cotley River system.
 Floodflow Alteration	X		5, 6, 7, 8, 9, 13	X	
 Fish and Shellfish Habitat		X	4, 17		Stream flows from stormwater system and wetland flows into the Cotley River.
 Sediment/Toxicant Retention	X		1, 7		
 Nutrient Removal	X		4, 10		
 Production Export	X		1, 4		
 Sediment/Shoreline Stabilization	X		1, 3		
 Wildlife Habitat	X		6, 7, 8, 17	X	
 Recreation		X	N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X	N/A		
 Uniqueness/Heritage		X	1, 22, 30		Wetland is hydrologically connected to the Taunton River.
 Visual Quality/Aesthetics		X	N/A		
ES Endangered Species Habitat		X	N/A		
Other					

Notes: * Refer to backup list of numbered considerations.
* Wetland 2e corresponds to wetland flag numbers A-9 to A-15, A-28 to A-33, A-39 to A-48, A-57 to A-66

Wetland Function-Value Evaluation Form

Total area of wetland 27.79 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Industrial park road & field Distance to nearest roadway or other development 20 ft.

Dominant wetland systems present PFO1E & stream (R2UB2H) Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid-basin

How many tributaries contribute to the wetland? 1+ Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 2f*

Latitude 41.8681 Longitude -71.0489

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
Type PFO Area ~ 1000 sq.ft

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	X	4, 5, 7, 8, 15	X	Wetland leads to the Cotley River system.
 Floodflow Alteration	X	4, 5, 7, 8, 9, 10, 13, 17, 18	X	
 Fish and Shellfish Habitat	X	4, 7, 8, 14, 15, 17		Wetland is adjacent to the Cotley River as it flows north through the site.
 Sediment/Toxicant Retention	X	1, 2, 3, 7, 10, 13, 14, 16	X	
 Nutrient Removal	X	3, 4, 5, 8, 10, 11, 13	X	
 Production Export	X	1, 2, 4, 10		
 Sediment/Shoreline Stabilization	X	1, 2, 3, 4, 6, 7, 9, 12, 15	X	
 Wildlife Habitat	X	6, 7, 8, 13, 17	X	
 Recreation		X N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X N/A		
 Uniqueness/Heritage		X 1, 19, 22, 30		Wetland is hydrologically connected to the Taunton River.
 Visual Quality/Aesthetics		X 11		
ES Endangered Species Habitat		X N/A		
Other				

Notes: * Refer to backup list of numbered considerations.
* Wetland 2f corresponds to wetland flag numbers A-5 to A-501/B-113 and B-222 to B-210/A-207.

Wetland Function-Value Evaluation Form

0.98 w/in
 Total area of wetland project Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No
Railroad track, access road,
 Adjacent land use forest, pond, & field Distance to nearest roadway or other development 20 ft.
 Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present No
 Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Mid-basin
 How many tributaries contribute to the wetland? 3+ Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 4*
 Latitude 41.8770 Longitude -71.0523
 Prepared by: ABA/SDH Date 10/25/12
 Wetland Impact:
 Type PFO Area ~ 1000 sq.ft
 Evaluation based on:
 Office X Field X
 Corps manual wetland delineation completed? Y X N _____

Function/Value	Suitability		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
	Y	N			
 Groundwater Recharge/Discharge	X		4, 5, 7, 8, 15	X	Wetland is abutting the Cotley River and adjacent to Barstow's Pond.
 Floodflow Alteration	X		5, 7, 8, 9, 10, 13, 14, 15, 16, 17	X	
 Fish and Shellfish Habitat	X		3, 4, 5, 6, 7, 14, 15, 16, 17		Wetland is adjacent to the Cotley River as it flows north through the site. Portion of river is suitable.
 Sediment/Toxicant Retention	X		1, 7, 10, 13, 14	X	Adjacent wetland/river is suited for this function.
 Nutrient Removal	X		3, 4, 10, 13	X	
 Production Export	X		1, 2, 4, 10		
 Sediment/Shoreline Stabilization	X		1, 2, 3, 4, 6, 7, 9, 14	X	
 Wildlife Habitat	X		1, 5, 6, 7, 8, 13, 17	X	
 Recreation		X	9		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X	N/A		
 Uniqueness/Heritage	X		7, 12, 13, 14, 16, 19, 22, 30	X	Wetland is hydrologically connected to the Taunton River. Wetland could be affected by dam project downstream. Prime viewing opportunities occur.
 Visual Quality/Aesthetics		X	1, 2, 7, 11		
ES Endangered Species Habitat		X	N/A		
Other					

Notes: * Refer to backup list of numbered considerations.
 * Wetland 4 corresponds to wetland flag numbers H-80/H-770 to H-68/H-758.

Wetland Function-Value Evaluation Form

Total area of wetland 0.23 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use Railroad tracks, field, & forest Distance to nearest roadway or other development 800 ft.

Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present No
Low in

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? sub-basin

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 5*

Latitude 41.8785 Longitude -71.0501

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
 Type PFO Area ~ 6,417 sq.ft

Evaluation based on:
 Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	<input checked="" type="checkbox"/>	4, 5, 8, 15	<input checked="" type="checkbox"/>	Wetland is a small forested depression where snow melt water and rain ponds.
 Floodflow Alteration	<input type="checkbox"/>	2, 5, 6, 8	<input type="checkbox"/>	Wetland is located on a broad, flat river terrace.
 Fish and Shellfish Habitat	<input type="checkbox"/>	N/A	<input type="checkbox"/>	Wetland does not contain a stream.
 Sediment/Toxicant Retention	<input type="checkbox"/>	7, 9	<input type="checkbox"/>	No ditches are present.
 Nutrient Removal	<input type="checkbox"/>	3, 10, 11	<input type="checkbox"/>	
 Production Export	<input type="checkbox"/>	1, 2, 4, 5	<input type="checkbox"/>	
 Sediment/Shoreline Stabilization	<input type="checkbox"/>	N/A	<input type="checkbox"/>	
 Wildlife Habitat	<input checked="" type="checkbox"/>	1, 3, 5, 7, 8, 17	<input checked="" type="checkbox"/>	Fox scat and other signs of wildlife were observed.
 Recreation	<input type="checkbox"/>	N/A	<input type="checkbox"/>	Wetland is located within a privately owned industrial park.
 Educational/Scientific Value	<input type="checkbox"/>	2	<input type="checkbox"/>	
 Uniqueness/Heritage	<input type="checkbox"/>	1, 19	<input type="checkbox"/>	Saw common wildlife utilizing wetland area.
 Visual Quality/Aesthetics	<input type="checkbox"/>	7, 11	<input type="checkbox"/>	
ES Endangered Species Habitat	<input type="checkbox"/>	N/A	<input type="checkbox"/>	
Other	<input type="checkbox"/>		<input type="checkbox"/>	

Notes: * Wetland 5 corresponds to wetland flag numbers WF N-1 to WF N-21

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.04 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use Access road, field, & forest Distance to nearest roadway or other development 650 ft.

Dominant wetland systems present PFO1E Contiguous undeveloped buffer zone present No

Low in

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? sub-basin

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 8*

Latitude 41.8806 Longitude -71.0484

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:

Type PFO Area ~ 1,604 sq.ft

Evaluation based on:

Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	X	4, 5, 8, 15	X	Wetland is a small forested depression where snow melt water and rain ponds.
 Floodflow Alteration	X	2, 5, 6, 8, 9	X	Wetland is a deep depression located on a broad, flat river terrace and capable of holding floodwater. Wetland does not contain a stream.
 Fish and Shellfish Habitat		N/A		
 Sediment/Toxicant Retention		X 7, 9		No ditches are present.
 Nutrient Removal		X 3, 10		
 Production Export		X 2, 4, 5		Dead trees with bird nests.
 Sediment/Shoreline Stabilization		X N/A		
 Wildlife Habitat	X	3, 5, 7, 8, 17		Fox scat and other signs of wildlife were observed.
 Recreation		X N/A		Wetland is located within a privately owned industrial park.
 Educational/Scientific Value		X N/A		
 Uniqueness/Heritage		X 1, 19		Saw common wildlife utilizing wetland area.
 Visual Quality/Aesthetics		X 7, 11		
ES Endangered Species Habitat		X N/A		
Other				

Notes:

* Wetland 8 corresponds to wetland flag numbers K-1 to K-6

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.01 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use Access road, field, & forest Distance to nearest roadway or other development 30 ft.

Dominant wetland systems present PEM1E Contiguous undeveloped buffer zone present No

Low in

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? sub-basin

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 9*

Latitude 41.8746 Longitude -71.0493

Prepared by: ABA/SDH Date 10/25/12

Wetland Impact:
Type PEM Area ~ 566 sq.ft

Evaluation based on:
Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge			4,5		Wetland does not contain soils, it is dominated by cattails on top of rock.
 Floodflow Alteration	X		2,6,8		Wetland is an excavated man-made depression located on a flat terrace and capable of holding minimal floodwater.
 Fish and Shellfish Habitat		X	N/A		Wetland does not contain a stream.
 Sediment/Toxicant Retention		X	7		
 Nutrient Removal		X	3,10		
 Production Export		X	N/A		
 Sediment/Shoreline Stabilization		X	N/A		
 Wildlife Habitat		X	7		
 Recreation		X	N/A		Wetland is located within a privately owned, previously disturbed industrial park.
 Educational/Scientific Value		X	N/A		
 Uniqueness/Heritage		X	1		
 Visual Quality/Aesthetics		X	N/A		
ES Endangered Species Habitat		X	N/A		
Other					

Notes:

* Wetland 9 corresponds to wetland flag numbers L-1 to L-7

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~3 acres Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use MassDOT facility, roads, electric ROW Distance to nearest roadway or other development 20-30 ft.

Dominant wetland systems present PEM1E, PSS1E, PFO1E Contiguous undeveloped buffer zone present No
Low in

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? sub-basin

How many tributaries contribute to the wetland? 3 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland 10

Latitude 41°52'24.899" Longitude 71°3'21.599"

Prepared by: JF/SH Date 6/21/13

Wetland Impact:
 Type PFO Area up to ~ 37,700
sq. ft

Evaluation based on:
 Office Field

Corps manual wetland delineation completed? Y N

Function/Value	Suitability Y N		Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	x		2, 4, 7, 15		Wetland contains several intermittent streams/constructed ditches.
Floodflow Alteration	x		4, 5, 6, 7, 9, 13		Several stormwater outlets flow into wetland system.
Fish and Shellfish Habitat		x	8, 10, 17		Wetland contains shallow, intermittent watercourses. No fish observed.
Sediment/Toxicant Retention	x		2, 10, 11, 12, 14	x	
Nutrient Removal		x			
Production Export	x		1, 4, 7, 8		
Sediment/Shoreline Stabilization	x		1, 3, 4, 6, 12		
Wildlife Habitat	x		7, 8, 9, 17, 19		Bird & small mammal habitat, deer evidence
Recreation		x		x	Wetland surrounded by fences on all sides
Educational/Scientific Value		x			Wetland is not accessible.
Uniqueness/Heritage		x			
Visual Quality/Aesthetics	x		N/A		Provides visual buffer to adjacent roadways
ES Endangered Species Habitat		x			
Other					

Notes:

* Wetland 10 corresponds to the 18-Series wetland flags

* Refer to backup list of numbered considerations.

Attachment B

Representative Site Photographs



Photo 1: Site of Functions and Values Assessment 2a.



Photo 2: Site of Functions and Values Assessment 2b.



Photo 3: Site of Functions and Values Assessment 2c.



Photo 4: View of intermittent stream at Functions and Values Assessment Site 2d.



Photo 5: View of vegetated wetland at Functions and Values Assessment Site 2d.



Photo 6: View of Functions & Values Assessment Site 2e.



Photo 7: View of wetland proximate to Functions and Values Assessment Site 2f.



Photo 8: Functions and Values Assessment Site 4.



Photo 9: Function and Values Assessment Site 5.



Photo 10: Functions and Values Assessment Site 8.



Photo 11: Functions and Values Assessment Site 9.



Photo 12: Functions and Values Assessment Site 10.

Attachment C

Wildlife & Vegetation Diversity/Abundance List

Attachment C - Wildlife & Vegetation Diversity/Abundance List

A. Wildlife Species List

Common Name

Scientific Name

Mammals

Whitetail Deer	<i>Odocoileus virginianus</i>
Coyote	<i>Canis latrans</i>
Red Fox	<i>Vulpes fulva</i>
Opossum	<i>Didelphis virginiana</i>
Striped Skunk	<i>Mephitis mephitis</i>
Raccoon	<i>Procyon lotor</i>
Woodchuck	<i>Marmota monax</i>
Eastern Cottontail	<i>Sylvilagus floridanus</i>
Gray Squirrel	<i>Sciurus carolinensis</i>
Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Eastern Chipmunk	<i>Tamias striatus</i>
Star-nosed Mole	<i>Condylura cristata</i>
Shorttail Shrew	<i>Blarina brevicauda</i>
White-footed Mouse	<i>Peromyscus leucopus</i>
Meadow Vole	<i>Microtus pennsylvanicus</i>
House Mouse	<i>Mus musculus</i>

Birds

Canada Goose	<i>Branta canadensis</i>
Mallard	<i>Anas platyrhynchos</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Great-horned Owl	<i>Bubo virginianus</i>
Barred Owl	<i>Strix varia</i>
Wild Turkey	<i>Meleagris gallopavo</i>
American Woodcock	<i>Scolopax minor</i>
Mourning Dove	<i>Zenaida macroura</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Northern Flicker	<i>Colaptes auratus</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>
Blue Jay	<i>Cyanocitta cristata</i>
American Crow	<i>Corvus brachyrhynchos</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Black-capped Chickadee	<i>Poecile atricapilla</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>

White-breasted Nuthatch
Eastern Bluebird
Veery
Wood Thrush
American Robin
Gray Catbird
Northern Mockingbird
European Starling
Blue-winged Warbler
Yellow Warbler
Black-and-white Warbler
Common Yellowthroat
Canada Warbler
Eastern Towhee
American Tree Sparrow
Chipping Sparrow
Field Sparrow
Song Sparrow
Swamp Sparrow
White-throated Sparrow
Dark-eyed Junco
Northern Cardinal
Red-winged Blackbird
Common Grackle
Baltimore Oriole
Purple Finch
American Goldfinch
Evening Grosbeak

Sitta carolinensis
Sialia sialis
Catharus fuscescens
Hylocichla mustelina
Turdus migratorius
Dumetella carolinensis
Mimus polyglottos
Sturnus vulgaris
Vermivora pinus
Dendroica petechia
Mniotilta varia
Geothlypis trichas
Wilsonia canadensis
Pipilo erythrophthalmus
Spizella arborea
Spizella passerina
Spizella pusilla
Melospiza melodia
Melospiza georgiana
Zonotrichia albicollis
Junco hyemalis
Cardinalis cardinalis
Agelaius phoeniceus
Quiscalus quiscula
Icterus galbula
Carpodacus purpureus
Carduelis tristis
Coccothraustes vespertinus

Reptiles

Common Snapping Turtle
Painted Turtle
Spotted Turtle
Northern Water Snake
Northern Brown Snake
Common Garter Snake
Eastern Smooth Green Snake
Eastern Milk Snake

Chelydra s. serpentina
Chrysemys picta
Clemmys guttata
Nerodia s. sipedon
Storeria d. dekayi
Thamnophis sirtalis
Liochorophis vernalis
Lampropeltis t. triangulum

Amphibians

Red-spotted Newt
Northern Redback Salamander
Spotted Salamander
American Toad
Northern Spring Peeper
Gray Treefrog
Bullfrog

Notophthalmus v. viridescens
Plethodon cinereus
Ambystoma maculatum
Bufo a. americanus
Pseudacris c. crucifer
Hyla versicolor
Rana catesbeiana

Northern Leopard Frog	<i>Rana pipiens</i>
Green Frog	<i>Rana clamitans melanota</i>
Wood Frog	<i>Rana sylvatica</i>

B. Dominant Vegetation Species List

<u>Common Name</u>	<u>Scientific Name</u>
Tree/Sapling	
red maple	<i>Acer rubrum</i>
white pine	<i>Pinus strobus</i>
oak	<i>Quercus</i> spp.
black tupelo	<i>Nyssa sylvatica</i>
American elm	<i>Ulmus americana</i>
hickory	<i>Carya</i> spp.
white ash	<i>Fraxinus americana</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Shrub	
sweet pepperbush	<i>Clethra alnifolia</i>
highbush blueberry	<i>Vaccinium corymbosum</i>
arrowwood	<i>Viburnum dentatum</i>
multiflora rose	<i>Rosa multiflora</i>
winterberry	<i>Ilex verticillata</i>
silky dogwood	<i>Cornus amomum</i>
elderberry	<i>Sambucus canadensis</i>
willow	<i>Salix</i> spp.
honeysuckle	<i>Lonicera</i> spp.
autumn olive	<i>Elaeagnus umbellata</i>
ironwood	<i>Carpinus caroliniana</i>
alder	<i>Alnus</i> spp.
spicebush	<i>Lindera benzoin</i>
Groundcover	
common greenbriar	<i>Smilax rotundifolia</i>
poison ivy	<i>Toxicodendron radicans</i>
sensitive fern	<i>Onoclea sensibilis</i>
cinnamon fern	<i>Osmunda cinnamomea</i>
New York fern	<i>Thelypteris noveboracensis</i>
royal Fern	<i>Osmunda regalis</i>
hayscented fern	<i>Dennstaedtia punctilobula</i>
jewelweed	<i>Impatiens capensis</i>
cattail	<i>Typha</i> spp.
purple loosestrife	<i>Lythrum salicaria</i>
soft rush	<i>Juncus effusus</i>
meadowsweet	<i>Spiraea latifolia</i>

goldthread
Carex sedges
common reed
aster
goldenrod
bristly dewberry
grape
woolgrass

Coptis trifolia
Carex spp.
Phragmites australis
Aster spp.
Solidago spp.
Rubus hispidus
Vitis spp.
Scirpus cyperinus

Appendix C-4
Vernal Pool Characterization and Valuation Form

US Army Corps of Engineers - New England District
Vernal Pool Characterization Form

Wetland 7

Project File # _____ Project Name First Light Pool ID (flags I)
Observer Amanda Atwell, Jeremy Fennell, Epsilon Associates Phone or E-mail 978-897-7100
Landowner/Applicant Ap: Mashpee Wampanoag Tribe: Cedric Cromwell Phone or E-mail 508-477-0208
Address 483 Great Road, South City Mashpee State MA Zip 02649
Location of vernal pool: City/State Taunton, MA
Brief directions to pool _____
Survey date(s) VP identification 4/10/12, Delineated July, 2012, Reviewed 10/26/12
Longitude/Latitude (in decimal degrees) -71.048621W, 41.879459N
USGS Quad Taunton Plat # _____ Lot # _____

A. VERNAL POOL LANDSCAPE CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- Upland depression Floodplain depression Pool within larger wetland system
 Pool part of a pool complex (within 1000 feet of one or more other vernal pools) Pool part of wildlife corridor
 Other _____

2. Vernal pool origin:

- Natural Natural, but Human Altered Anthropogenic Unknown

Describe any recent modifications to the pool and associated landscape: Appears to have a spoil pile or soil stock-pile associated with the southern edge, this area is covered with Japanese knotweed

3. Parent material:

- Glacial fluvial ("outwash") Loose till Peat
 Dense till Alluvium

B. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Wetland type(s) that best apply to this pool:

- Forested wetland Herbaceous wetland Floodplain (overflow/oxbow)
 Shrub wetland Open water Other: Forest overstory contributes to shading within the pool.
 Peatland (acidic fen or bog) Intermittent stream

2. Pool canopy cover (%) 60

3. Predominant substrate:

- Mineral soil
 Organic matter (peat/muck) Depth 1.5 ft (histic epipedon)
Organic matter sampling location (e.g., deepest zone, edge, etc.) Edge is mineral, center of pool is histic

4. Pool size:

- a. Approximate dimensions of pool (at maximum capacity; include units): Length 200 feet Width 75 feet
b. Approximate area of pool (at maximum capacity): 37,500 square feet
c. Maximum depth at deepest point at time of survey (include units): 18 inches

5. Hydrology

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the example indicator species to best predict the expected hydroperiod of the pool):

- Dries between early March and early July (e.g., *Thelypteris palustris*, *Carex stricta*, *Impatiens capensis*, *Ilex verticillata*)
 Dries between early July and early September (e.g., *Sagittaria latifolia*, *Scirpus cyperinus*, *Dulichium arundinaceum*, *Cephalanthus occ.*)
 Dries between early September and early November (e.g., *Eleocharis palustris*, *Glyceria canadensis*, *Utricularia* spp., *Decodon vert.*)
 Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.)

b. Inlet/outlet (circle which in each instance):

Pool ID Wetland 7

- No inlet/outlet Permanent inlet or outlet (channel with well-defined banks and permanent flow)
 Temporary inlet/outlet Other _____

C. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Surrounding forest cover within 100 ft (30.5 m) (%) 95 100-750 ft (230 m) (%) 60

2. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

- Forested wetland _____ % Agriculture field (4%) %
 Forested upland 96 % Developed (<25% impervious surface) _____ %
 Shrub/herbaceous wetland _____ % Developed (>25% impervious surface) _____ %
 Shrub/herbaceous upland _____ % Other (please specify) _____ %

3. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

- Forested wetland _____ 6 % Agriculture _____ %
 Forested upland _____ 46 % Developed (<25% impervious surface) _____ 16 %
 Shrub/herbaceous wetland _____ 5 % Developed (>25% impervious surface) _____ 12 %
 Shrub/herbaceous upland (field) 15 % Other (please specify) _____ %

Based on: Field estimate GIS

D. SPECIES PRESENT IN VERNAL POOL

Was the entire pool comprehensively surveyed for egg masses? Yes No

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (<i>Lithobates sylvaticus</i>)	4/10	2	
Spotted Salamander (<i>Ambystoma maculatum</i>)	4/10	166	
Blue-spotted Salamander (<i>Ambystoma laterale</i>)			
Jefferson's Salamander (<i>Ambystoma jeffersonianum</i>)			
Marbled Salamander (<i>Ambystoma opacum</i>)			
Fairy Shrimp (<i>Eubranchipus</i> spp.)		PRESENCE/ABSENCE/	ABUNDANCE:
FACULTATIVE SPECIES	DATE	PRESENCE/ABSENCE	FEW/COMMON/MANY
Spring Peeper (<i>Pseudacris crucifer</i>)			
Gray Tree Frog (<i>Hyla versicolor</i>)			
American Toad (<i>Anaxyrus americanus</i>)			
Eastern Spadefoot Toad (<i>Scaphiopus holbrookii</i>)			
Fowler's Toad (<i>Anaxyrus fowleri</i>)			
Fingernail Clams (Sphaeriidae, Pisidiidae)			
Caddisflies (Limnephilidae, Phryganeidae)			
OTHER SPECIES	DATE	PRESENCE/ABSENCE	FEW/COMMON/MANY
Rare Species (list): _____			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list): _____			

Other comments (append photographs, additional notes, sketch of pool and surrounding landscape):

3-16-2012 Also found large 1.5 to 2 inch unidentified tadpoles in pools. April 2012 was very dry, temperatures were high, many pools dried out this Spring prior to amphibian lifecycle completion.

C. SPECIES PRESENT IN VERNAL POOL

16 Indicator species present (check all that apply):

Wood Frog

Jefferson's Salamander

Spotted Salamander

Marbled Salamander

Blue-spotted Salamander

Fairy Shrimp

Rare Species (check all that apply):

4 Blanding's Turtle

4 Spadefoot Toad

-16 Resident predator population present (check all that apply):

Bullfrog tadpoles

Green Frog tadpoles

Fish

Other (specify) _____

16 **TOTAL for Pool Species (see NOTE in text)**

SUMMARY:

24 **Pool Characteristics**

30.2 **Envelope and Critical Habitat**

16 **Pool Species**