## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

**Project/Site:** Antrim Wind Farm - Laydown Yard **City/County:** Antrim **Sampling Date:** 13-Jul-12

**Applicant/Owner:** Antrim Wind Energy **State:** NH **Sampling Point:** **AN-LD-3-7 Wet**

**Investigator(s):** AF JG **Section, Township, Range: S.** **T.** **R.**

**Landform (hillslope, terrace, etc.):** Lowland **Local relief (concave, convex, none):** concave **Slope:** 5.0 % / 2.9 °

**Subregion (LRR or MLRA):** LRR R **Lat.:** **Long.:** **Datum:**

**Soil Map Unit Name:** **NWI classification:** PFO

**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ◉ No ○ **(If no, explain in Remarks.)**

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ◉ | No ○ | |
| **Hydric Soil Present?** | Yes ◉ | No ○ | **Is the Sampled Area within a Wetland?** Yes ◉ No ○ |
| **Wetland Hydrology Present?** | Yes ◉ | No ○ | |

**Remarks: (Explain alternative procedures here or in a separate report.)**

Isolated wetland at terminus of Intermittent Stream AN-LD-INT-1. Stream dissipates on level ground into soil.

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ 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 along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2 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)
- ☑ FAC-neutral Test (D5)

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ○ | No ◉ | Depth (inches): | |
| Water Table Present? | Yes ○ | No ◉ | Depth (inches): | |
| Saturation Present? (includes capillary fringe) | Yes ◉ | No ○ | Depth (inches): 0 | **Wetland Hydrology Present?** Yes ◉ No ○ |

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

Remarks:

## VEGETATION - Use scientific names of plants

**Sampling Point:** AN-LD-3-7 Wet

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| 1. Acer rubrum | 50 | ☑ | 100.0% | FAC |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| | 50 | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15) | | | | |
| 1. Fraxinus pennsylvanica | 15 | ☑ | 38.5% | FACW |
| 2. Acer rubrum | 10 | ☑ | 25.6% | FAC |
| 3. Tsuga canadensis | 2 | ☐ | 5.1% | FACU |
| 4. Acer pensylvanicum | 2 | ☐ | 5.1% | FACU |
| 5. Spiraea latifolia | 10 | ☑ | 25.6% | FAC+ |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| | 39 | = Total Cover | | |
| **Herb Stratum** (Plot size: 5) | | | | |
| 1. Osmunda regalis | 25 | ☑ | 62.5% | OBL |
| 2. Onoclea sensibilis | 10 | ☑ | 25.0% | FACW |
| 3. Acer rubrum | 5 | ☐ | 12.5% | FAC |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| 11. | 0 | ☐ | 0.0% | |
| 12. | 0 | ☐ | 0.0% | |
| | 40 | = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | | |
| 1. | 0 | ☐ | 0.0% | |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 0 | = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | | |
|---|---|---|---|---|
| OBL species | 25 | x 1 = | 25 | |
| FACW species | 25 | x 2 = | 50 | |
| FAC species | 75 | x 3 = | 225 | |
| FACU species | 4 | x 4 = | 16 | |
| UPL species | 0 | x 5 = | 0 | |
| Column Totals: | 129 | (A) | 316 | (B) |

Prevalence Index = B/A = 2.450

**Hydrophytic Vegetation Indicators:**

- ☐ **Rapid Test for Hydrophytic Vegetation**
- ☑ **Dominance Test is > 50%**
- ☑ **Prevalence Index is ≤3.0** [1]
- ☐ **Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

### 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 3.28 ft (1m) tall..

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ◉ No ○

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point:** AN-LD-3-7 Wet

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | | % | Type [1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR | 3/2 | 100% | | | | | | Sandy Loam | |
| 6-16 | 2.5Y | 5/2 | 95% | 2.5Y | 5/1 | 5% | D | M | Loamy Sand | |
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[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: 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 Muck 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 Soils :** [3]

- ☐ 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 (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

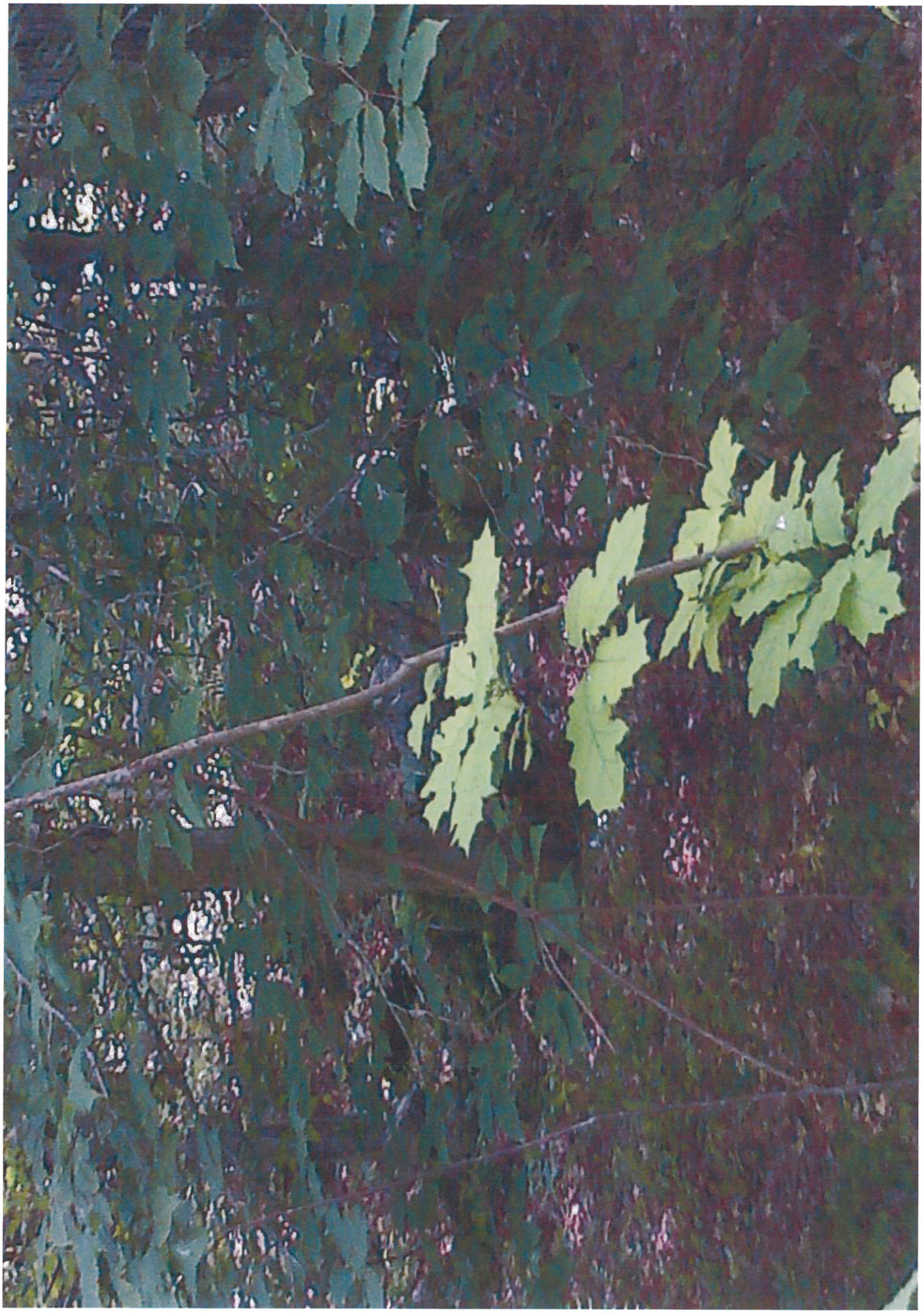
**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes ◉ No ○

Remarks:



## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

**Project/Site:** Antrim Wind Farm - Laydown Yard **City/County:** Antrim **Sampling Date:** 11-Jul-12

**Applicant/Owner:** Antrim Wind Energy **State:** NH **Sampling Point:** **AN-LD-4-12 Up**

**Investigator(s):** AF JG **Section, Township, Range: S.** **T.** **R.**

**Landform (hillslope, terrace, etc.):** Lowland **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

**Subregion (LRR or MLRA):** LRR R **Lat.:** **Long.:** **Datum:**

**Soil Map Unit Name:** **NWI classification:**

**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ◉ No ○ **(If no, explain in Remarks.)**

**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ 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 ◉ | No ○ | |
| **Hydric Soil Present?** | Yes ○ | No ◉ | **Is the Sampled Area within a Wetland?** Yes ○ No ◉ |
| **Wetland Hydrology Present?** | Yes ○ | No ◉ | |

**Remarks: (Explain alternative procedures here or in a separate report.)**

Old Borrow Pit

### Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ 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 along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2 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)
- ☐ FAC-neutral Test (D5)

**Field Observations:**

| | | | | |
|---|---|---|---|---|
| Surface Water Present? | Yes ○ | No ◉ | Depth (inches): | |
| Water Table Present? | Yes ○ | No ◉ | Depth (inches): | |
| Saturation Present? (includes capillary fringe) | Yes ○ | No ◉ | Depth (inches): | **Wetland Hydrology Present?** Yes ○ No ◉ |

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

Remarks:

## VEGETATION - Use scientific names of plants

**Sampling Point:** AN-LD-4-12 Up

| | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| **Tree Stratum** (Plot size: ) | | | | |
| 1. | 0 | ☐ | 0.0% | |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| | 0 | | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15 ) | | | | |
| 1. Populus tremula | 15 | ☑ | 33.3% | FACU |
| 2. Alnus rugosa | 10 | ☑ | 22.2% | FACW+ |
| 3. Betula populifolia | 20 | ☑ | 44.4% | FAC |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| | 45 | | = Total Cover | |
| **Herb Stratum** (Plot size: 5 ) | | | | |
| 1. Dichanthelium clandestinum | 20 | ☑ | 37.7% | FAC+ |
| 2. Rudbeckia hirta | 5 | ☐ | 9.4% | FACU- |
| 3. Rubus idaeus | 3 | ☐ | 5.7% | FAC- |
| 4. Daucus carota | 10 | ☐ | 18.9% | UPL |
| 5. Melilotus officinalis | 15 | ☑ | 28.3% | FACU- |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| 11. | 0 | ☐ | 0.0% | |
| 12. | 0 | ☐ | 0.0% | |
| | 53 | | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | | |
| 1. | 0 | ☐ | 0.0% | |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 0 | | = Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | | |
|---|---|---|---|---|
| OBL species | 0 | x 1 = | 0 | |
| FACW species | 10 | x 2 = | 20 | |
| FAC species | 43 | x 3 = | 129 | |
| FACU species | 35 | x 4 = | 140 | |
| UPL species | 10 | x 5 = | 50 | |
| Column Totals: | 98 | (A) | 339 | (B) |

Prevalence Index = B/A = 3.459

**Hydrophytic Vegetation Indicators:**

- ☐ **Rapid Test for Hydrophytic Vegetation**
- ☑ **Dominance Test is > 50%**
- ☐ **Prevalence Index is ≤3.0** [1]
- ☐ **Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

### 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 3.28 ft (1m) tall..

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ◉ No ○

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point:** AN-LD-4-12 Up

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type [1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-17 | 10YR 4/4 | 100% | | | | | medium sand | |

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: 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 Muck 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 Soils :** [3]

- ☐ 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 (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators 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:

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

**Project/Site:** Antrim Wind Farm - Laydown Yard **City/County:** Antrim **Sampling Date:** 11-Jul-12

**Applicant/Owner:** Antrim Wind Energy **State:** NH **Sampling Point:** AN-LD-4-12 Wet

**Investigator(s):** AF JG **Section, Township, Range: S.** **T.** **R.**

**Landform (hillslope, terrace, etc.):** Swale **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

**Subregion (LRR or MLRA):** LRR R **Lat.:** **Long.:** **Datum:**

**Soil Map Unit Name:** **NWI classification:** PSS

**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes (•) No ( ) **(If no, explain in Remarks.)**

**Are Vegetation** [ ] **, Soil** [ ] **, or Hydrology** [ ] **significantly disturbed?** **Are "Normal Circumstances" present?** Yes (•) 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 (•) No ( )

**Hydric Soil Present?** Yes (•) No ( )

**Wetland Hydrology Present?** Yes (•) No ( )

**Is the Sampled Area within a Wetland?** Yes (•) No ( )

**Remarks: (Explain alternative procedures here or in a separate report.)**

Old Borrow Pit Excavation

## Hydrology

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- [ ] Surface Water (A1)
- [x] High Water Table (A2)
- [x] 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)
- [x] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of 2 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)
- [x] FAC-neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes (•) No ( ) Depth (inches):

Water Table Present? Yes (•) No ( ) Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes (•) No ( ) Depth (inches): 0

**Wetland Hydrology Present?** Yes (•) No ( )

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

Remarks:

## VEGETATION - Use scientific names of plants

**Sampling Point:** AN-LD-4-12 Wet

| Tree Stratum (Plot size: ) | Absolute % Cover | Dominant Species? | Rel.Strat. Cover | Indicator Status |
|---|---|---|---|---|
| 1. | 0 | ☐ | 0.0% | |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| | 0 | | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15 ) | | | | |
| 1. Alnus rugosa | 20 | ☑ | 66.7% | FACW+ |
| 2. Spiraea latifolia | 10 | ☑ | 33.3% | FAC+ |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| 5. | 0 | ☐ | 0.0% | |
| 6. | 0 | ☐ | 0.0% | |
| 7. | 0 | ☐ | 0.0% | |
| | 30 | | = Total Cover | |
| **Herb Stratum** (Plot size: 5 ) | | | | |
| 1. Scirpus cyperinus | 25 | ☑ | 44.6% | FACW+ |
| 2. Juncus effusus | 10 | ☑ | 17.9% | FACW+ |
| 3. Carex trisperma | 10 | ☑ | 17.9% | OBL |
| 4. Rubus hispidus | 5 | ☐ | 8.9% | FACW |
| 5. Impatiens capensis | 1 | ☐ | 1.8% | FACW |
| 6. Dichanthelium clandestinum | 5 | ☐ | 8.9% | FAC+ |
| 7. | 0 | ☐ | 0.0% | |
| 8. | 0 | ☐ | 0.0% | |
| 9. | 0 | ☐ | 0.0% | |
| 10. | 0 | ☐ | 0.0% | |
| 11. | 0 | ☐ | 0.0% | |
| 12. | 0 | ☐ | 0.0% | |
| | 56 | | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | | |
| 1. | 0 | ☐ | 0.0% | |
| 2. | 0 | ☐ | 0.0% | |
| 3. | 0 | ☐ | 0.0% | |
| 4. | 0 | ☐ | 0.0% | |
| | 0 | | = Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | | |
|---|---|---|---|---|
| OBL species | 10 | x 1 = | 10 | |
| FACW species | 61 | x 2 = | 122 | |
| FAC species | 15 | x 3 = | 45 | |
| FACU species | 0 | x 4 = | 0 | |
| UPL species | 0 | x 5 = | 0 | |
| Column Totals: | 86 | (A) | 177 | (B) |

Prevalence Index = B/A = 2.058

**Hydrophytic Vegetation Indicators:**

- ☐ **Rapid Test for Hydrophytic Vegetation**
- ☑ **Dominance Test is > 50%**
- ☑ **Prevalence Index is ≤3.0** [1]
- ☐ **Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

### 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 3.28 ft (1m) tall..

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ◉ No ○

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

**Sampling Point:** AN-LD-4-12 Wet

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

| Depth (inches) | Matrix Color (moist) | | % | Redox Features Color (moist) | % | Type [1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR | 3/2 | 100% | | | | | Loamy Sand | |
| 4-15 | 2.5Y | 5/1 | 100% | | | | | medium sand | |

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: 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 Muck 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 Soils :** [3]

- ☐ 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 (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators 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:

## Response to Env-Wt 302.04(a)

***(a) For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction:***

*(1) The need for the proposed impact;*

Impacts to wetlands have been avoided and minimized to the greatest extent practical. Turbine, access road, substation, and collector system facilities have been carefully sited to meet design, operational, and safety needs while avoiding and minimizing impacts to natural resources, including wetlands.

Ten identified wetlands will be impacted either temporarily or permanently as a result of Project construction and operation. No jurisdictional vernal pools, or areas currently described as potential vernal pools will be impacted as a result of Project construction or operation. In total, approximately 0.21 acres (9,305 square feet) of wetland impact are expected to be incurred as a result of construction and operation of the proposed Project. This small amount of impact is the result of careful Project planning and design, which aimed to avoid and minimize impacts to these important resources. The direct wetland impacts are those which were deemed unavoidable during the Project planning process.

*(2) The alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site;*

During the development of the Project the AWE made significant efforts to avoid and minimize impact to wetlands and surface waters. Prior to siting of any facilities, AWE conducted a reconnaissance survey for sensitive resources, including wetlands, streams and natural communities. Once these areas were identified, facilities were sited and formal delineations were conducted. During detailed design of the facility, numerous revisions were made to the iterative Project layout design process to further reduce the level of impact of the Project. However, due to design and construction constrains of wind projects in New England, some level of wetland impact was unavoidable. AWE believes that the Project, as presented, represents the lowest possible degree of impact to wetlands and surface waters. For additional information on the alternatives evaluated for this Project, please refer to Section H of the SEC Application.

*(3) The type and classification of the wetlands involved;*

Detailed narrative descriptions of all identified wetland features relevant to the Project are provided in the full Wetland Delineation Report, which is provided in Exhibit 5 of this Wetlands Permit Application.

In general, wetlands within the Project area consist primarily of small forested wetlands that occur along skidder trails, in confined pockets in the regional bedrock, in saddle areas along the ridgeline, and in areas with poorly drained soils that support wetland vegetation. Streams within the Project area include unnamed perennial and intermittent streams which drain either to the north toward Route 9, or to the southeast into Gregg Lake. Because the proposed Project area is along a ridgeline and is moderately well drained, very few perennial streams occur. Observations in the field generally

suggest that rainfall and snow-melt quickly run off the ridge to lower elevations, without collecting volumes that fill natural depressions or create natural ponds.

A total of ten wetlands will be impacted by Project operation and development. Seven of these are palustarine forested wetlands (five PFO1 and two PFO4), and three are palustarine scrub-shrub wetlands (PSS1) in maintained electric transmission ROW and in a former gravel borrow pit. For detailed descriptions of these wetlands, please see the Supplemental Wetland Delineation Report, Exhibit 5 of this Application, Table 4-1.

(4) *The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters;*

The locations of wetlands to be impacted relative to nearby wetlands and surface waters are illustrated in Appendix A, Figure 2 provided in the Supplemental Wetland Delineation Report, which is Exhibit 5 of this Application.

(5) *The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area;*

None of the wetlands or surface waters impacted by the Project is considered rare.

(6) *The surface area of the wetlands that will be impacted;*

In total, approximately 0.21 acres (9,305 square feet) of wetland impact are expected to be incurred as a result of construction and operation of the proposed Project. Specific impacts to individual wetlands are described in Table 4-1 of the Supplemental Wetland Delineation Report, which is provided in Exhibit 5 of this Application.

(7) *The impact on plants, fish and wildlife including, but not limited to:*

The Project does not expect to have an undue adverse impact on fish and wildlife species. A detailed discussion of the fish and wildlife impacts associated with the Project is included in Section I of the SEC Application and associated appendices.
a. Rare, special concern species;
b. State and federally listed threatened and endangered species;
c. Species at the extremities of their ranges;
d. Migratory fish and wildlife;
e. Exemplary natural communities identified by the DRED-NHB; and
f. Vernal pools.

(8) *The impact of the proposed project on public commerce, navigation and recreation;*

A detailed discussion of impact of the Project on public commerce, navigation and recreation is included in Section J of the SEC Application.

(9) *The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake;*

A detailed discussion of the aesthetic impact of the Project is included in Section I of the SEC Application and associated appendix. The Project does not anticipate having an undue adverse impact.

*(10) The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area;*

The Project is located entirely on private land and any land access is granted at the will of the landowners. The Project will limit access to their immediate project facilities and access to the remainder of the property will remain at the landowner's will. Please see Section J.1 of the SEC application for a further discussion of public rights of passage or access.

*(11) The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties;*

No wetland impacts will occur within 20 feet of adjacent property boundaries. All abutting property owners will be notified of the proposed project in accordance with NHDES rules. Documentation of this notification is found in Exhibit 4.

*(12) The benefit of a project to the health, safety, and well being of the general public;*

Public health and safety impacts of the Project are discussed in Section I of the SEC Application.

*(13) The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site;*

Due to the lack of groundwater resources on the site, this project is not expected to have any direct or indirect impacts on groundwater drinking resources. The AWE site does not have any aquifers on the project site and there are no source water protection and/or well head protection areas on or adjacent to the site. The closest public water supply well is 1.06 miles from the project development. The project does not propose to make large groundwater withdrawals and thus will have no effect on groundwater supply.

Most of the site is made up of stony soils that are relatively shallow in depth to bedrock, and observations in the field generally suggest that rainfall and snow melt in the spring quickly run off the ridge to lower elevations, without collecting volumes that fill natural depressions or create natural ponds. The small forested wetland areas on the site occur along skidder trails, confined pockets in the regional bedrock, and in saddle areas along the ridgeline. These type of soils limit the value of these wetlands for groundwater recharge. Additionally, wetlands with peaty, organic soils increase the retention time of water, slowing recharge.

The limited ability of the site wetlands to recharge groundwater combined with limited sources of potential project pollutants that would adversely affect the quality of the groundwater results in a very low potential for this project to adversely affect groundwater quality.

The majority of wetlands in the project are perched with shallow depths to bedrock or impervious soils and rely on precipitation, surface sheet flow, and shallow subsurface flows for maintenance of wetland hydrology. There are a few wetlands occurring along benches at the toe of steep slopes where the hydrology of the wetland relies primarily on the discharge of groundwater from breakout seeps. Because the project has minimal wetland impacts (0.21 acres of impact total in 10 distinct wetland areas) and proposes to maintain natural flow patterns to the extent practical, there should be minimal change in groundwater discharge patterns to wetlands.

The intent in the project development has been to minimize surface water and stormwater runoff impacts starting with the initial field survey work through the design phase and by implementing accepted erosion control and stormwater Best Management Practices (BMPs) during construction and operation of the facility. During the field survey portion of the project, areas of drainage including jurisdictional wetland and streams as well as non-jurisdictional drainage (to the extent possible) were mapped during field surveys. The design phase included maintaining natural drainage patterns where possible through the use of culverts and subsurface stone drainage ways (stone mattresses). During construction, field drainage conditions will be taken into consideration, and there will be flexibility to install appropriate measures to maintain drainage. Any runoff from the roads will be routed into undisturbed buffers to help maintain water quality and disperse and distribute water volumes to approximate pre-development flows.

Additional erosion control and stormwater BMPs to protect surface water quality during construction of this project have focused on control of erosion during construction through use of sediment barriers and the use of soil stabilization measures including erosion control blankets, spray-on polymer emulsions, and prompt stabilization of exposed surfaces. See the Civil Design Plans at Exhibit 7A of the SEC Application.

The proposed development will alter approximately 63 acres of land. In order to evaluate the project's effect on peak stormwater runoff rates, a hydrologic model was developed to evaluate the existing and proposed drainage conditions on the site. The results of the analyses indicate that there is no significant change in peak discharge rates between the pre- and post-development conditions for the 2, 10, and 50 year storm events (See the stormwater management plans included in the Alteration of Terrain permit application included as Appendix 2B of the SEC application).

*(14) The potential of a proposed project to cause or increase flooding, erosion, or sedimentation;*

The project has been designed in conformance with standard best management practices for wind park construction and stormwater management. Details of the stormwater management plans for the Project are included in the Alteration of Terrain permit application included as Appendix 2B of the SEC Application.

*(15) The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards;*

This criterion typically applies to projects involving shoreline alterations. Since there are no large open bodies of water or flowing streams being affected by the Project, proposed redevelopment of the site will not redirect current or wave energy. Stream crossings have been designed in accordance with the *New Hampshire Stream Crossing Guidelines* to the extent practicable to minimize the potential for erosion resulting from new crossings.

*(16) The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted;*

AWE has leased approximately 1,854 acres of private land on seven parcels for the development of the Project. All wetlands that will be impacted by the Project are located entirely within these parcels.

*(17) The impact of the proposed project on the values and functions of the total wetland or wetland complex;*

The AWE project has been designed to avoid and minimize impacts on wetlands to the extent practicable. This started with desktop review of readily available information including USGS and NWI mapping to identify the field survey area. The initial assessment of the field survey corridor started with investigation for vernal pools as snow cover left the site and later for wetlands. As it was determined there would be wetland impacts and needs for changes in project alignment and design, additional survey area was added and investigated for natural resources. This is typical of an iterative process that continued throughout the period of resource delineation and civil design (May – October, 2011).

The total permanent impact to wetlands and surface water resources is approximately 0.21 acres. This wetland impact is only 0.3 percent of the land area to be disturbed by this project (63 acres).

The primary function of wetlands on the project site is wildlife habitat. The very small area of impact inherently limits the amount of impact to this function. Additionally the narrow, linear nature of these impacts (primarily from gravel roads) further limits impact to this function. The one perennial stream crossing has been designed with an open bottom arch culvert which will allow for maintenance of the natural substrates and unrestricted flows along the natural channel.

There are indirect impacts from road construction and a turbine pad to vernal pool terrestrial habitat (VP1, 2, 3, and 7), however these impacts are only to upland area and do not include any impact to the associated wetlands. It is not anticipated that these impacts will adversely affect the productivity of these pools. There is no direct impact to any of the vernal pool breeding habitats (depression). See the attached Vernal Pool Report at Exhibit 6 for additional information.

*(18) The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication;*

An evaluation of the impact of the Project on historic sites is included in Section I and Appendices 9C and 9D of the SEC Application.

*(19) The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries; and*

No such areas have been identified within the Project area.

*(20) The degree to which a project redirects water from one watershed to another.*

The Project has been designed to minimize the impacts to hydrology on the site and minimize the interruption of the natural flow. Details of the design can be found in the Alteration of Terrain permit application included as Appendix 2B of the SEC Application.