# Draft Environmental Impact Statement for the Noble Ball Hill Windpark Towns of Villenova and Hanover

## Chautauqua County, New York

**September 2008 • Volume II**



Prepared for:

**Noble Ball Hill Windpark, LLC**
P.O. Box 72
7294 Centerville Road
Bliss, N.Y. 14024

Prepared by:

ecology and environment, inc.
International Specialists in the Environment

# Draft
# Environmental Impact Statement for the Noble Ball Hill Windpark

## Towns of Villenova and Hanover
## Chautauqua County, New York

**Volume II**

**September 2008**

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P.O. Box 72
7294 Centerville Road
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**Prepared by:**

**ECOLOGY AND ENVIRONMENT, INC.**
368 Pleasant View Drive
Lancaster, New York 14086

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# B NYSDAM Guidelines for Agriculture Mitigation

# Agricultural Mitigation for Windpower Projects
# Revised 1-4-08

The following guidelines shall apply to construction areas for wind power construction projects impacting agricultural land. The project sponsor shall coordinate with the New York State Department of Agriculture and Markets (Ag. and Markets) to develop an appropriate schedule for inspections to assure that the goals of these guidelines are being met. The project sponsor shall hire an Environmental Monitor to oversee the construction and restoration in agricultural fields.

**Siting Goals**

Minimize impacts to normal farming operations by locating structures along field edges and in nonagricultural areas where possible.

Avoid dividing larger fields into smaller fields, which are more difficult to farm, by locating access roads along the edge of agricultural fields (hedgerows and field boundaries) and in nonagricultural areas where possible.

Locate access roads, which cross agricultural fields, along ridge tops and following field contours, where possible, to eliminate the need for cut and fill and reduce the risk of creating drainage problems.

All existing drainage and erosion control structures such as diversions, ditches, and tile lines shall be avoided or appropriate measures taken to maintain the design and effectiveness of the existing structures. Any structures disturbed during construction shall be repaired to as close to original condition as possible, as soon as possible, unless such structures are to be eliminated based on a new design.

**Construction Requirements**

The surface of access roads constructed through agricultural fields shall be level with the adjacent field surface.

Culverts and waterbars shall be installed to maintain natural drainage patterns.

All topsoil must be stripped from agricultural areas used for vehicle and equipment traffic and parking. All vehicle and equipment traffic and parking shall be limited to the access road and/or designated work areas such as tower sites and laydown areas. No vehicles or equipment will be allowed outside the work area without prior approval from the landowner and, when applicable, the Environmental Monitor.

Topsoil from work areas (tower sites, parking areas, "open-cut" electric cable trenches, along access roads) shall be stockpiled separate from other excavated material (rock and/or subsoil). At least 50 feet of temporary workspace is needed along "open-cut"

electric cable trenches for proper topsoil segregation. All topsoil will be stockpiled immediately adjacent to the area where stripped/removed and shall be used for restoration on that particular site. Topsoil stockpile areas shall be clearly designated in the field and on the on-site "working set" of construction drawings.

Electric interconnect cables and transmission lines installed above ground can create long term interference with agricultural land use. As a result, interconnect cables shall be buried in agricultural fields wherever practicable. Interconnect cables and transmission lines installed above ground should be located outside field boundaries wherever possible. When above ground cables and transmission lines must cross farmland, the project sponsor shall minimize agricultural impacts by using taller structures that provide longer spanning distances and shall locate poles on field edges to the greatest extent practicable. The line location and pole placements shall be reviewed with the Department and the Environmental Monitor prior to final design.

In cropland, hayland and improved pasture a minimum depth of forty-eight inches of cover will be required for all buried electric cables. In unimproved grazing areas and land permanently devoted to pasture, a minimum depth of thirty-six inches of cover will be required. In areas where the depth of soil over bedrock ranges from zero to forty-eight inches, the electric cables shall be buried entirely below the top of the bedrock or at the depth specified for the particular land use whichever is less. At no time will the depth of cover be less than twenty-four inches below the soil surface.

All excess subsoil and rock shall be removed from the site. On site disposal of such material may be allowed if approved by the landowner and the Environmental Monitor, with appropriate consideration given to any possible agricultural or environmental impacts.*

In pasture areas, work areas will be fenced to prevent livestock access, consistent with landowner agreements.

All pieces of wire, bolts, and other unused metal objects will be picked up and properly disposed of as soon as practical after the unloading and packing of turbine components so that these objects will not be mixed with any topsoil.*

Excess concrete will not be buried or left on the surface in active agricultural areas. Concrete trucks will be washed outside of active agricultural areas.*

(*Any permits necessary for disposal under local, State and/or federal laws and regulations must be obtained by the contractor, with the cooperation of the landowner when required.)

**Restoration Requirements**

Following construction, all disturbed agricultural areas will be decompacted to a depth of 18 inches with a deep ripper or heavy-duty chisel plow. In areas where the topsoil was

stripped, soil decompaction shall be conducted prior to topsoil replacement. Following decompaction, all rocks 4 inches and larger in size will be removed from the surface of the subsoil prior to replacement of the topsoil. The topsoil will be replaced to original depth and the original contours will be reestablished where possible. All rocks 4 inches and larger shall be removed from the surface of the topsoil. Subsoil decompaction and topsoil replacement should be avoided after October 1, unless approved on a site-specific basis by the landowner in consultation with Ag. and Markets. All parties involved should be cognizant that areas restored after October 1st may not obtain sufficient growth to prevent erosion over the winter months. If areas are to be restored after October 1st, necessary provision should be made to restore any eroded areas in the springtime, to establish proper growth.

All access roads will be regraded to allow for farm equipment crossing and to restore original surface drainage patterns, or other drainage pattern incorporated into the design.

All restored agricultural areas shall be seeded with the seed mix specified by the landowner, in order to maintain consistency with the surrounding areas.

All surface or subsurface drainage structures damaged during construction shall be repaired to as close to preconstruction conditions as possible, unless said structures are to be removed as part of the project design.

Following restoration, all construction debris will be removed from the site.

**Two Year Monitoring and Remediation**

The Project Sponsor will provide a monitoring and remediation period of no less than two years immediately following the completion of initial restoration. The two year period allows for the effects of climatic cycles such as frost action, precipitation and growing seasons to occur, from which various monitoring determinations can be made. The monitoring and remediation phase will be used to identify any remaining agricultural impacts associated with construction that are in need of mitigation and to implement the follow-up restoration.

General conditions to be monitored include topsoil thickness, relative content of rock and large stones, trench settling, crop production, drainage and repair of severed fences, etc. Impacts will be identified by the Environmental Monitor through on site monitoring of all agricultural areas impacted by construction and through contact with respective farmland operators and the Department of Agriculture and Markets.

Topsoil deficiency and trench settling shall be mitigated with imported topsoil that is consistent with the quality of topsoil on the affected site. Excessive amounts of rock and oversized stone material will be determined by a visual inspection of disturbed areas as compared to portions of the same field located outside the construction area. All excess rocks and large stones will be removed and disposed of by the Project Sponsor.

When the subsequent crop productivity within affected areas is less than that of the adjacent unaffected agricultural land, the Project Sponsor as well as other appropriate parties, will help to determine the appropriate rehabilitation measures to be implemented. Because conditions which require remediation may not be noticeable at or shortly after the completion of construction, the signing of a release form prior to the end of the remediation period will not obviate the Project Sponsor's responsibility to fully redress all project impacts.

Subsoil compaction shall be tested using an appropriate soil penetrometer or other soil compaction measuring device. Compaction tests will be made for each soil type identified on the affected agricultural fields. The subsoil compaction test results within the affected area will be compared with those of the adjacent unaffected portion of the farm field/soil unit. Where representative subsoil density of the affected area exceeds the representative subsoil density of the unaffected areas, additional shattering of the soil profile will be performed using the appropriate equipment. Deep shattering will be applied during periods of relatively low soil moisture to ensure the desired mitigation and to prevent additional subsoil compaction. Oversized stone/rock material which is uplifted to the surface as a result of the deep shattering will be removed.

## NEW YORK STATE FARMLANDS

# SEEDING, FERTILIZING, AND LIME RECOMMENDATIONS FOR GAS PIPELINE RIGHT-OF-WAY RESTORATION IN FARMLANDS

Rev. 6-15-2005

Provided by:

NYS Dept. of Agriculture and Markets
Division of Agricultural Protection and Development Services
10-B Airline Drive
Albany NY 12235-0001

## NEW YORK STATE FARMLANDS

## SEEDING, FERTILIZER, AND LIME RECOMMENDATIONS FOR GAS PIPELINE RIGHT-OF-WAY RESTORATION IN FARMLANDS

*This paper supplements the Department of Agriculture and Markets' publication, "Pipeline Right-of-Way Construction Projects: Agricultural Mitigation Through Stages of Project Planning, Construction/ Restoration and Follow-Up Monitoring (Rev. 11-97)." It is intended to familiarize the reader with varieties of seed mixes that are proven highly effective, in New York State farmlands affected by pipeline right-of-way construction, with full agricultural mitigation.*

*The paper lists several different seed mixes, for permanent cover, and provides other pertinent information including: temporary cover; the need for and use of soil nutrients; as well as follow-up monitoring and other useful notes. This paper is NOT intended as a guide to the sequential steps of disking and surface tillage for seedbed preparation and the sequence of liming, fertilizing, seeding, and mulching.*

*** **ALL SEEDING RATES BELOW ARE FOR DRILL SEEDER APPLICATION [*PREFERRED METHOD*].**

*** **IF BROADCAST SEEDING IS USED, ALL SEEDING RATES [*BELOW*] MUST BE DOUBLED.**

### A. Permanent Seeding Mixtures.

1.) Common for hayland planting:

a.) Alfalfa 20# if seeded alone, or with one of the following cold season grasses: Timothy, or Orchard grass, or Bromegrass should be added if one of these grasses is desired by the farm operator, at the rate of 8# per acre. [*See "3) Quick Erosion Control" below.*]

b.) Pardee Birdsfoot Trefoil 16# per acre, plus either:
Timothy, or Orchard grass, or Bromegrass should be added [per farm operator's choice] at 6# per acre rate. [*See "3) Quick Erosion Control" below.*]

c.) Medium Red Clover or Mammoth Red Clover 15# per acre, plus either: Timothy, or Orchard grass, or Bromegrass should be added [per farm operator's choice] at the rate of 6# per acre. [*See "3) Quick Erosion Control" below.*]

2.) Common for pasture planting:

a.) Dutch White Clover 6# per acre; plus
Pardee Birdsfoot Trefoil 6# per acre; plus
Orchard grass 6# per acre

b.) Note: Reed Canary Grass at the rate of 18# per acre is excellent hay or pasture grass for wetter soils. For hay, cut early. Do not use Reed Canary Grass in wetlands.

[*See "3) Quick Erosion Control" below.*]

3.) *Quick Erosion Control:*

For quick control of erosion when seeding the right-of-way: mix Annual Ryegrass as an additive into each of the Permanent Seeding Mixtures [see above]. Annual Ryegrass provides the quickest temporary cover against erosion [while the other plants are still in their slower/longer period of development]. Use approximately 6# or 7# per acre of the Annual Ryegrass when drill seeding the mix. Double the amount to 12# to 14# of Annual Ryegrass if broadcast.

THE DRILL SEEDING RATES [LISTED ABOVE] FOR DISTURBED PIPELINE RIGHT-OF-WAY ARE SLIGHTLY INCREASED OVER THE STANDARD RATES IN ORDER TO HELP COMPENSATE FOR THE LOWER THAN NORMAL GERMINATION RATES DUE TO:

- THE LOWERING OF NUTRIENTS AVAILABLE TO THE PLANTS AFTER PIPELINE CONSTRUCTION HAS DISTURBED TOPSOIL AND SUBSOIL.
- TIMING OF SEED MIX APPLICATION MAY BE IDEAL FOR SOME OF THE VARIETIES IN A MIX BUT ONLY MARGINAL FOR ONE OR MORE OTHERS.

Special situation seeding, at project's risk for pastureland only:
If the right-of-way's soil is restored by late September, a "risk" seeding can be applied between late September and the third week in October: Aroostook Winter Rye at 2 bu. or 112# per acre, mixed with: Pardee Birdsfoot Trefoil 16# per acre, Tall Fescue 20# per acre and Orchard Grass 8# per acre.
The Aroostook Rye provides winter cover, and portions of the high rate of Trefoil, Fescue, and Orchard Grass seed may stay dormant until the following spring season. If successful in coverage, the permanent seeding of respective pastures is complete. If not, the site must be reseeded.

**B. Temporary Cover.**

1.) For large-size pipeline right-of-way projects with a two-year plan, to construct one year and restore the following year.

a.) Topsoil berm
Topsoil stripping and stockpiling performed in late spring to mid summer – broadcast seed the entire topsoil berm with either Oats at 2 bu. [80#] per acre, or Aroostook Winter Rye at 2 bu. [112#] per acre in July-August. A light to moderate rate [about 1500 – 2000 #/acre] of weed-free straw mulch cover may be needed for retaining adequate summer soil moisture. [*For larger size topsoil berms, the temporary cover seeding may be more uniformly applied by "flattening" the top of the berm and using small, light equipment to drop and broadcast seed from the top, covering all surfaces of the berm.*]

b.) Exposed construction zone/subsoil
After backfilling, by or before late October, plant the exposed right-of-way subsoil to Aroostook Winter Rye at the rate of 3 bu. [168#] per acre with broadcast seeder; or 2 bu. [112#] if drill seeded. In preparation, the surface of the exposed subsoil is first scarified generally parallel with the slope's contours and fertilized with 200# of 10-20-20 (N,P,K) per acre, for temporary winter cover to succeed, due to the subsoil compaction and its low fertility. Apply a light to moderate [not heavy] rate [about 1000 #/acre] of weed-free straw mulch over the temporary seeding.

*Note that other temporary cover seedings, in addition to those noted above, may be used, pending on seasonal conditions and the mutual approval of the farmland operator and agricultural inspector.*

2.) For any pipeline right-of-way project, large or small where a "winterized" right-of-way is necessary and a seeding with Aroostook Winter Rye can be applied before the end of October:
Topsoil berm and exposed, backfilled construction zone
Apply 3 bu. [168#] per acre, broadcast. Refer to Exposed construction zone above regarding scarification of surface and rate of straw mulch.

3.) For unavoidable, off-season construction ["mud and freeze-thaw" season construction], when topsoil is stripped after October, and effective, temporary cover seeding is impossible due to inherent climate factors: use a moderate rate of weed-free straw mulch cover over the topsoil berm. Establish and maintain all temporary erosion controls along the construction right-of-way corridor – throughout the off season construction – including but not limited to: outside perimeter runoff ditching; silt fencing; water bars and runoff drainage gaps through the topsoil berm and across right-of-way to prevent water ponding, berm saturation, and erosion.

**C. Use Seed Inocculant.**

1.) Remember to apply the appropriate variety of fresh inocculant to all legume seed before use [e.g.: alfalfa, birdsfoot trefoil, etc.]. *Even if the*

*seed label says it is pre-inocculated, the viable seed in the batch could easily be two or more years old while the pre-inocculant is past its life.* The certified seed itself may still be good, but non-responsive without the proper fresh inocculant applied at the time of seeding.

**D. Fertilizer For Right-of-Way Reseeding:**

Soil Testing. The fertilizer rates listed below are approximations. Prior to construction, before the topsoil is stripped, representative sampling is conducted: agronomic soil samples are obtained about 400 feet apart along the right-of-way, and submitted and laboratory tested for: pH; % organic material; cation exchange capacity, and N,P,K [Nitrogen, Phosphorus/*Phosphate*, and Potassium/*Potash*). The results are applied to determine the lime and fertilizer rate to apply for the respective soils and farms.

1.) "10-20-20" This means 10# of nitrogen, 20# of phosphorus, 20# of potash per 100# of fertilizer. Pending on test results, use 300# per acre. [This totals out to 30# of nitrogen, 60# of phosphorous, 60# of potash per acre.]

2.) "5-10-10" This means 5# of nitrogen, 10# of phosphorus, 10# of potash per 100# of fertilizer. Pending on test results, use 600# per acre. [This totals out to 30# of nitrogen, 60# of phosphorous, 60# of potash per acre.]

**E. Fertilizer for temporary cover seeding of exposed right-of-way construction work surface.**

Refer to "Temporary Cover" B. 1. b. Exposed construction zone/subsoil on page 2.

(*Fertilizer is not recommended for temporary seed cover on the topsoil berm, but is strongly advised on the exposed subsoil surface.*)

**F. Fertilizer as a topdressing** [follow-up additive] **in haylands and pastures:**

"16-8-8" This means 16# of nitrogen, 8# of phosphorous, 8# of potash per 100# of fertilizer. Use 200-300# per acre, depending on field conditions. This totals out to either:
32# of nitrogen, 16# of phosphorus, 16# of potash; or
48# of nitrogen, 24# of phosphorus, 24# of potash per acre.

## G. Agricultural Lime.

See reference to Soil testing, for pH, in **D. Fertilizing For Right-of-Way Reseeding**, above.

- A minimum rate of 3 tons agricultural lime per acre for most permanent seedings in naturally low-lime soils [e.g.: Southern Tier/northern Allegheny Plateau]. A heavier amount will be applied if so indicated from pH test results. Use lower lime rate on naturally high-lime soils based on site specific soil pH test and farm record of recent lime application [e.g.: Central Plains/northern half of Finger Lakes Region].

- Pelletized and agriculture lime are rated the same in tons to be applied. Except pelletized is easier to handle and reacts to the soil quicker but it cannot be reduced in its amount. [Do not use "liquid lime" on agricultural land.]

## H. Monitoring and Follow-Up.

- Restored right-of-way is monitored for not less than two years after initial restoration seeding is completed. The seeding is satisfactory if it produces equal to or better than the adjacent undisturbed planting.
  Seasonal surface soil moisture conditions will vary from year to year, and may be ideal to poor [excessively dry] for germination when pipeline project applies the seed. Seedings that are unsatisfactory due to lower plant population/poor plant health or overpopulation of weeds will be replanted.

  *For monitoring of crop productivity, refer to: "Special Crop Productivity Monitoring Procedures," a February 1993 paper, provided by the NYS Department of Agriculture and Markets.*

## I. Final Notes on Seedings.

- Always use certified seed for each variety used alone or in a mix.

- Always use a Brillon® drill seeder with rear cultipacker, or similar implement, for hayland and improved pasture seedings.

- Do not try to seed when the ground is wet.

- While Empire birdsfoot trefoil has been a traditional variety applied throughout the region, the more recently developed "Pardee" birdsfoot trefoil is widely applied with proven performance in soils with drainage limitations and even better in well-drained soils. The Pardee variety has improved winter survival over other varieties when properly planted.

- Remember to double the permanent seeding rates when using broadcast seeding due to the mortality rate.

- Perennial Ryegrass is not a favorite grass with farmers and is not recommended in seed mixes on agricultural right-of-way.

- Incorporate fertilizer and lime into the soil; and apply fine surface tillage/seedbed preparation practices

- Creeping Fescue is shade tolerant.

# C Agency Correspondence

# DEC Correspondence

**ecology and environment, inc.**
International Specialists in the Environment
BUFFALO CORPORATE CENTER
368 Pleasant View Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

September 18, 2006

Ms. Jean Pietrusiak
Information Services; New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, New York 12233-4757

Re: Noble Environmental Power LLC
Towns of Villenova and Hanover
Chautauqua County, NY

Dear Ms. Pietrusiak:

Ecology & Environment, Inc. (E & E), on behalf of Noble Environmental Power LLC (Noble), is preparing a feasibility study for a potential wind energy facility in the Towns of Villenova and Hanover, Chautauqua County, NY. Prior analyses of meteorological conditions in the vicinity of this area have identified the presence of a favorable wind resource. The project, if implemented, would create a renewable energy supply, with the electricity generated from the facility to be supplied to the regional electric supply grid. This project would be specifically designed to meet the needs of the Governor's initiative to increase the percentage of New York State's electric supply from renewable sources to 25% by 2013.

The proposed Ball Hill project area is shown in the enclosed figure. The figure is a composite of the Cherry Creek (1990), Forestville (1990), Perrysburg (1990), and Hamlet (1990) 7.5 minute USGS topographic quadrangle maps.

We are currently analyzing the potential issues involved with the siting of a wind energy facility in the identified area; therefore, no specific layout of facilities or infrastructure is available. Rather, based our preliminary evaluation of existing resources, Noble would design the facility to minimize impacts to the extent possible. E & E is seeking your assistance in identifying state-listed threatened or endangered species, significant or critical habitats, natural areas, or other wildlife or fisheries features that may occur within the identified project area boundary.

If you have any questions regarding this data request or require additional project information, please do not hesitate to call me at 716-684-8060. Thank you very much for your attention to this request. We look forward to receiving your input on this project.

Sincerely,
ECOLOGY & ENVIRONMENT, INC.

Christine Sousa
Biologist

Enc.: (1)

cc: Sandy Sayyeau (Noble)
Christina Presnell (Noble)
Mike Morgante (E & E)

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\\BUFSDL4\GIS\Buffalo\Noble Wind\2008 NOBLE SITES\Maps\Villenova\MXDs\Avian Study\Villenova_24K_topo.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Ball Hill Project Area**
**USGS1:24,000 Quadrangle**

0 0.5 1 2
Miles

**New York State Department of Environmental Conservation**
**Division of Fish, Wildlife & Marine Resources**
**New York Natural Heritage Program**
625 Broadway, 5th floor, Albany, New York 12233-4757
**Phone:** (518) 402-8935 • **FAX:** (518) 402-8925
**Website:** www.dec.state.ny.

Denise M. Sheehan
Commissioner

October 17, 2006

Christine Sousa
Ecology and Environment, Inc
Buffalo Corporate Ctr, 368 Pleasant View Dr.
Lancaster, NY 14086

Dear. Ms. Sousa:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed Noble Environmental Power Wind Energy Facility, area as indicated on the map you provided, located in the Towns of Villenova and Hanover, Chautauqua County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

PLEASE NOTE: For Windpower Projects, we report all records found within the project boundary, and any avian records that may be located within a 10-mile buffer of the project boundary. We also report Indiana bat hibernaculum that may be located within a 40-mile buffer of the project boundary.

The presence of rare species may result in this project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Seoane

Tara Seoane, Information Services
NY Natural Heritage Program

Enc.

cc: Reg. 9, Wildlife Mgr
Jack Nasca, Environmental Permits, Albany
Mark Wothal, Bureau of Habitat, Albany

## Natural Heritage Report on Rare Species and Ecological Communities

**These occurrences are within 10-miles of the project site.**

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor, Albany, NY
12233-4757
(518) 402-8935

~This report contains **SENSITIVE** information that may not be released to the public without permission from the NY Natural Heritage Program.
~Refer to the User's Guide for explanations of codes, ranks and fields.
~Location maps for certain species and communities may not be provided if 1) the species is vulnerable to disturbance, 2) the location and/or extent is not precisely known, and/or 3) the location and/or extent is too large to display.

## Natural Heritage Report on Rare Species and Ecological Communities

**BIRDS**

### *Ammodramus henslowii*

**Henslow's Sparrow**

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B; Vulnerable | 11071 |
| **Federal Listing:** | | **Global Rank:** | G4; Apparently secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |

**County:** Chautauqua
**Town:** Arkwright
**Location:** Brainard Road Fields
**Directions:** From Cowdens Corner, follow Skinner Miller Road south to Brainard Road. Turn west on Brainard Road. The birds were found in fields on the south side of the road.
**General Quality and Habitat:** **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859.

### *Ardea herodias*

**Great Blue Heron**

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Protected | **NYS Rank:** | S5; Demonstrably secure | 4800 |
| **Federal Listing:** | | **Global Rank:** | G5; Demonstrably secure | SL |
| **Last Report:** | 1995-04-03 | **EO Rank:** | Good or Fair | |

**County:** Chautauqua
**Town:** Arkwright
**Location:** Dibble Hill, Farrington Hollow
**Directions:** The rookery is located about 0.8 mi northwest of Town Corners and 2000 feet northwest of the junction of Farrington Hollow Road and Hamlet Road.
**General Quality and Habitat:** Usually more than 50 nests/year, but some years less. Ridgetop with mature northern hardwoods-beech, maple, hemlock. Nests mostly in beech trees.

### *Asio flammeus*

**Short-eared Owl**

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Endangered | **NYS Rank:** | S2; Imperiled | 11085 |
| **Federal Listing:** | | **Global Rank:** | G5; Demonstrably secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |

**County:** Chautauqua
**Town:** Sheridan
**Location:** Dunkirk Airport Sheridan
**Directions:** The birds were observed in the fields bounded by Middle Road to the south, Newell Road to the east, Harrington Road to the west, and a railroad to the north, in the town of Sheridan.
**General Quality and Habitat:** **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859.

*Cistothorus platensis*

**Sedge Wren**

Office Use 10681

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B; Vulnerable | |
| **Federal Listing:** | | **Global Rank:** | G5; Demonstrably secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |
| **County:** | Chautauqua | | | |
| **Town:** | Sheridan | | | |
| **Location:** | Middle Road Field Sheridan | | | |
| **Directions:** | From Sheridan, follow Center Road north to Route 121 (Middle Road). Turn west on Route 121 (Middle Road). Look for a stone driveway on the north side of the road (mailbox #2897). The birds were observed in the field in front of the willow plantation. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

*Cistothorus platensis*

**Sedge Wren**

Office Use 10686

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B; Vulnerable | |
| **Federal Listing:** | | **Global Rank:** | G5; Demonstrably secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |
| **County:** | Chautauqua | | | |
| **Town:** | Pomfret | | | |
| **Location:** | Sage Road Field Nortons Switch | | | |
| **Directions:** | From Fredonia, follow Route 20 west to Adams Road. Turn south on Adams Road and follow it to Webster Road. Turn west on Webster Road then turn south on Sage Road. The birds were seen and heard on both sides of the road. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

*Haliaeetus leucocephalus*

**Bald Eagle**

Office Use 9672

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S2S3B,S2N; Imperiled | |
| **Federal Listing:** | Threatened | **Global Rank:** | G5; Demonstrably secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |
| **County:** | Cattaraugus, Chautauqua | | | |
| **Town:** | Cattaraugus Indian Reservation, Cattaraugus Indian Reservation | | | |
| **Location:** | Cattaraugus Creek Indian Reservation | | | |
| **Directions:** | There are five nests on the south side of Cattaraugus Creek about 5 kilometers upstream (east) of the New York State Thruway crossing. The location of Nest D has not been GPSed, but it is right next to Nest E. Access is only through the Reservation of Seneca Nation. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

*Haliaeetus leucocephalus*

**Bald Eagle**

Office Use 11638

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S2S3B,S2N; Imperiled | |
| **Federal Listing:** | Threatened | **Global Rank:** | G5; Demonstrably secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |
| **County:** | Cattaraugus | | | |
| **Town:** | Dayton | | | |
| **Location:** | Conewango Swamp | | | |
| **Directions:** | The bald eagles are nesting east of Dexter Corners and west of Wolf Road. One nest is in Conewango Swamp and the other is just southwest near a tributary associated with the swamp. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

Records Processed

**These occurrences are within the project site or in close proximity.**

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor, Albany, NY
12233-4757
(518) 402-8935

~This report contains **SENSITIVE** information that may not be released to the public without permission from the NY Natural Heritage Program.
~Refer to the User's Guide for explanations of codes, ranks and fields.
~Location maps for certain species and communities may not be provided if 1) the species is vulnerable to disturbance, 2) the location and/or extent is not precisely known, and/or 3) the location and/or extent is too large to display.

Natural Heritage Report on Rare Species and Ecological Communities

## COMMUNITIES

### Rich hemlock-hardwood peat swamp

This occurrence of Rich Hemlock-Hardwood Peat Swamp is considered significant from a statewide perspective by the NY Natural Heritage Program. It is either an occurrence of a community type that is rare in the state or a high quality example of a more common community type. By meeting specific, documented significance criteria, the NY Natural Heritage Program considers this occurrence to have high ecological and conservation value. Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Unlisted | **NYS Rank:** | S2S3; | 961 |
| **Federal Listing:** | | **Global Rank:** | G3G4; | SL |
| **Last Report:** | 1992-08-28 | **EO Rank:** | | |
| **County:** | Chautauqua | | | |
| **Town:** | Arkwright, Villenova | | | |
| **Location:** | West Mud Lake Swamp | | | |
| **Directions:** | From Black Corners (junction of Route 83 and Farrington Hollow Road), go east on Route 83 about 1.0 mi to West Mud Lake (easily seen to the north of Route 83). The swamp is along the west edge of West Mud Lake. The swamp continues south of Route 83 along the west side of West Branch Conewango Creek. | | | |
| **General Quality and Habitat:** | Excellent quality, with history of some selective logging followed by very good recovery. Community is well-buffered. Minimal disturbance and good size. A mixed conifer and hardwood swamp along the west side of west Mud Lake, a eutrophic pond. The wetland continues to the south of Route 83. To the north and west of wetland are agricultural fields. The swamp extends south of Route 83 west of West Branch Conewango Creek. The southern portion of the swamp is more disturbed by selective logging than the north end (west of the lake). The north end is pristine. | | | |

### Shrub swamp

This occurrence of Shrub Swamp is considered significant from a statewide perspective by the NY Natural Heritage Program. It is either an occurrence of a community type that is rare in the state or a high quality example of a more common community type. By meeting specific, documented significance criteria, the NY Natural Heritage Program considers this occurrence to have high ecological and conservation value. Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Unlisted | **NYS Rank:** | S5; | 3633 |
| **Federal Listing:** | | **Global Rank:** | G5; | |
| **Last Report:** | 1990-08-15 | **EO Rank:** | | |
| **County:** | Chautauqua | | | |
| **Town:** | Hanover, Villenova | | | |
| **Location:** | East Mud Lake | | | |
| **Directions:** | From the junction of Route 93 and Route 39 in Parcells Corners, travel south on Route 93 (Hanover Road) 1.75 miles. Mud Lake and the swamp are on the right (west) side of the road. Ask permission for access to the site. | | | |
| **General Quality and Habitat:** | Of good size and biologically diverse, with some cottages on the lake shore. Uplands around the wetlands are primarily farm fields. There were no exotics observed. A lake and small pond surrounded by a very dense shrub swamp thicket. Further upland, the shrub swamp gradually transitions into a red maple swamp which eventually merges with a hemlock-northern hardwood forest. East Mud Lake is bordered on the west side by homes and cottages. Much of the surrounding landscape is farm fields. | | | |

## SH

*Ichthyomyzon greeleyi*

Office Use 11520

**Mountain Brook Lamprey**

**NY Legal Status:** Special Concern
**NYS Rank:** S1; Critically imperiled
**Federal Listing:**
**Global Rank:** G3G4; Vulnerable
**Last Report:** 2001-05-04
**EO Rank:** Extant
**County:** Chautauqua
**Town:** Villenova
**Location:** West Branch Conewango Creek
**Directions:** The lampreys were found in West Branch Conewango Creek at Route 322.
**General Quality and Habitat:** The lampreys were found in a creek.

3 Records Processed

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**ecology and environment, inc.**
International Specialists in the Environment

**BUFFALO CORPORATE CENTER**
368 Pleasant View Drive, Lancaster, New York 14086
Tel: (716) 684-8060, Fax: (716) 684-0844

May 19, 2008

Ms. Jean Pietrusiak
Information Services; New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany NY 12233-4757

Re: Noble Environmental Power LLC., Town of Villenova, Chautauqua County, NY

Dear Ms. Pietrusiak:

Ecology & Environment, Inc. (E & E), on behalf of Noble Environmental Power LLC (Noble), is preparing a Draft Environmental Impact Statement (DEIS) for a potential wind energy facility in the Town of Villenova, Chautauqua County, New York. The project, if implemented, would include approximately 70 wind turbines and associated access roads and collection lines.

E & E requested your assistance in identifying state-listed threatened or endangered species, significant or critical habitats, natural areas, or other wildlife or fisheries features that may occur within the identified project area in a letter dated September 1, 2006. You provided a response via a letter dated October 16, 2006 (see attached). A detailed bird and bat study has been conducted at the Project Area and the resulting study report will be forwarded to the Department for review once it is finalized. At this time we request any updated information available regarding protected species or significant habitats in the vicinity of the Project.

Enclosed is an updated figure of the proposed project area to aid in your evaluation of the project. The figure is a composite of the Cherry Creek (1990), Forestville (1990), Perrysburg (1990), and Hamlet (1990) 7.5 minute USGS topographic quadrangle maps.

If you have any questions regarding this data request, or require additional project information, please do not hesitate to call me at 716-684-8060 or contact me by e-mail at lweaver@ene.com. Thank you very much for your attention to this request. We look forward to receiving your input on this project.

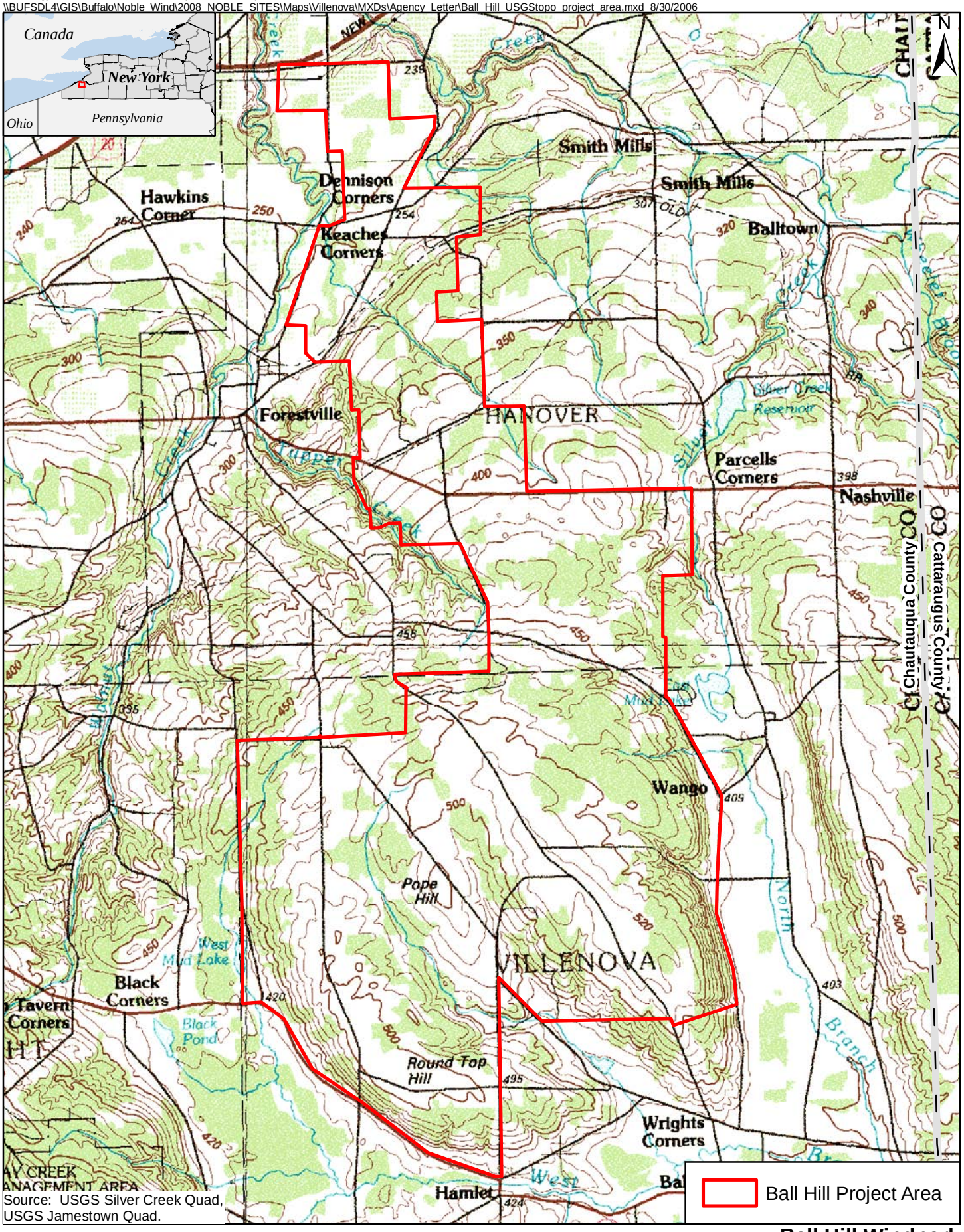
Sincerely,
ECOLOGY & ENVIRONMENT, INC.



Laurie Weaver
Biologist

Enc.: (1)
CC: Kristin Hawley; Noble Environmental Power, LLC.
Cory Zahm; Ecology & Environment Inc.

© Ecology & Environment, Inc. GIS Department Project #00227.NP20.02.02
\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\Agency_Letter\Ball_Hill_USGStopo_project_area.mxd 8/30/2006




Source: USGS Silver Creek Quad, USGS Jamestown Quad.

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

**Ball Hill Windpark**
**1:100,000 USGS Topographic Map**

**New York State Department of Environmental Conservation**
**Division of Fish, Wildlife & Marine Resources**
**New York Natural Heritage Program**
625 Broadway, Albany, New York 12233-4757
**Phone:** (518) 402-8935 • **FAX:** (518) 402-8925
www.dec.state.ny.us

Alexander B. Grannis
Commissioner

June 3, 2008

Laurie Weaver
Ecology and Environment
Buffalo Corp. Ctr, 368 Pleasant View Drive
Lancaster, NY 14086

Dear Ms. Weaver:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed Noble Environmental Power - Wind Energy Project - 70 Turbines, area as indicated on the map you provided, located in the Town of Villenova, Chautauqua County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and should not be released to the public without permission from the New York Natural Heritage Program.

PLEASE NOTE: For Windpower Projects, we report all records found within the project boundary, and any avian records that may be located within a 10-mile buffer of project boundary. We also report Indiana Bat Hibernacula that may be located within a 40-mile buffer of the project boundary.

PLEASE NOTE: We refer you to http://www.dec.ny.gov/energy/40899.html on the DEC Website for guidelines for your proposed project.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environment impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Seoane

Tara Seoane, Information Services
New York Natural Heritage Program

cc: Reg. 9, Wildlife Mgr.
Mark Wothal, Bureau of Wildlife, Albany
R. Edick, Environmental Permits, Albany

These occurrences are within the project site or in close proximity.

## Natural Heritage Report on Rare Species and Ecological Communities

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor, Albany, NY
12233-4757
(518) 402-8935

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~Location maps for certain species and communities may not be provided 1) if the species is vulnerable to disturbance, 2) if the location and/or extent is not precisely known, 3) if the location and/or extent is too large to display, and/or 4) if the animal is listed as Endangered or Threatened by New York State.

Natural Heritage Report on Rare Species and Ecological Communities

## COMMUNITIES

### Rich hemlock-hardwood peat swamp

This occurrence of Rich Hemlock-Hardwood Peat Swamp is considered significant from a statewide perspective by the NY Natural Heritage Program. It is either an occurrence of a community type that is rare in the state or a high quality example of a more common community type. By meeting specific, documented significance criteria, the NY Natural Heritage Program considers this occurrence to have high ecological and conservation value.

Office Use

**NY Legal Status:** Unlisted
**NYS Rank:** S2S3
961
**Federal Listing:**
**Global Rank:** G3G4
**Last Report:** 1992-08-28
**EO Rank:**
**County:** Chautauqua
SL
**Town:** Arkwright, Villenova
**Location:** West Mud Lake Swamp
**Directions:** From Black Corners (junction of Route 83 and Farrington Hollow Road), go east on Route 83 about 1.0 mi to West Mud Lake (easily seen to the north of Route 83). The swamp is along the west edge of West Mud Lake. The swamp continues south of Route 83 along the west side of West Branch Conewango Creek.

**General Quality and Habitat:** Excellent quality, with history of some selective logging followed by very good recovery. Community is well-buffered. Minimal disturbance and good size. A mixed conifer and hardwood swamp along the west side of west Mud Lake, a eutrophic pond. The wetland continues to the south of Route 83. To the north and west of wetland are agricultural fields. The swamp extends south of Route 83 west of West Branch Conewango Creek. The southern portion of the swamp is more disturbed by selective logging than the north end (west of the lake). The north end is pristine.

## VASCULAR PLANTS

### *Pinguicula vulgaris*

Butterwort

Office Use

**NY Legal Status:** Threatened
**NYS Rank:** S2 - Imperiled
4618
**Federal Listing:**
**Global Rank:** G5 - Demonstrably secure
**Last Report:** 1992-06-28
**EO Rank:** Good
**County:** Chautauqua
**Town:** Hanover
**Location:** Walnut Creek Gorge
**Directions:** Walnut Creek Gorge. From the junction of Route 20 and Route 5 in Silver Creek, proceed south on Route 20 about 1.2 mi to main road. Park at the cemetery near the junction of main road and Route 20. Proceed down into the gorge to Walnut Creek. Follow thecreek upstream about 1.0 mi. The plants are high up on wet, shaly cliffs on the west side of the gorge.

**General Quality and Habitat:** This is a small, healthy population at an excellent site. Wet shale cliffs that are verticle, sun-free, east-facing, and continuously wet. The substrate and soils probably have a calcareous component.

These occurrences are within the project site or in close proximity.
2 Records Processed

More detailed information about many of the rare and listed animals and plants in New York, including biology, identification, habitat, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org, from NatureServe Explorer at http://www.natureserve.org/explorer, from NYSDEC at http://www.dec.ny.gov/animals/7494.html (for animals), and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

More detailed information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org. For descriptions of all community types, go to http://www.dec.ny.gov/animals/29384.html and click on DRAFT--Ecological Communities of New York State.

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These bird occurrences are within 10 miles of the project site.

## Natural Heritage Report on Rare Species and Ecological Communities

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor, Albany, NY
12233-4757
(518) 402-8935

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~Refer to the User's Guide for explanations of codes, ranks and fields.
~Location maps for certain species and communities may not be provided 1) if the species is vulnerable to disturbance, 2) if the location and/or extent is not precisely known, 3) if the location and/or extent is too large to display, and/or 4) if the animal is listed as Endangered or Threatened by New York State.

Natural Heritage Report on Rare Species and Ecological Communities

### BIRDS

#### *Ammodramus henslowii*

**Henslow's Sparrow**

Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B - Vulnerable | 11071 |
| **Federal Listing:** | | **Global Rank:** | G4 - Apparently secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | |
| **County:** | Chautauqua | | | |
| **Town:** | Arkwright | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

#### *Ardea herodias*

**Great Blue Heron**

Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Protected | **NYS Rank:** | S5 - Demonstrably secure | 4800 |
| **Federal Listing:** | | **Global Rank:** | G5 - Demonstrably secure | |
| **Last Report:** | 1995-04-03 | **EO Rank:** | Good or Fair | |
| **County:** | Chautauqua | | | SL |
| **Town:** | Arkwright | | | |
| **Location:** | Dibble Hill | | | |
| **General Quality and Habitat:** | Usually more than 50 nests/year, but some years less. Ridgetop with mature northern hardwoods-beech, maple, hemlock. Nests mostly in beech trees. | | | |

#### *Asio flammeus*

**Short-eared Owl**

Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Endangered | **NYS Rank:** | S2 - Imperiled | 11085 |
| **Federal Listing:** | | **Global Rank:** | G5 - Demonstrably secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | |
| **County:** | Chautauqua | | | |
| **Town:** | Sheridan | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

These bird occurrences are within 10 miles of the project site.

***Circus cyaneus***

Northern Harrier

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B,S3N - Vulnerable | 12702 |
| **Federal Listing:** | | **Global Rank:** | G5 - Demonstrably secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | |
| **County:** | Cattaraugus | | | |
| **Town:** | Dayton, Leon | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

***Cistothorus platensis***

Sedge Wren

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B - Vulnerable | 10681 |
| **Federal Listing:** | | **Global Rank:** | G5 - Demonstrably secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | |
| **County:** | Chautauqua | | | |
| **Town:** | Sheridan | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

***Cistothorus platensis***

Sedge Wren

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B - Vulnerable | 10686 |
| **Federal Listing:** | | **Global Rank:** | G5 - Demonstrably secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | |
| **County:** | Chautauqua | | | |
| **Town:** | Pomfret | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

***Haliaeetus leucocephalus***

Bald Eagle

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S2S3B,S2N - Imperiled | 9672 |
| **Federal Listing:** | Threatened | **Global Rank:** | G5 - Demonstrably secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | USFWS |
| **County:** | Cattaraugus, Chautauqua | | | |
| **Town:** | Cattaraugus Indian Reservation, Cattaraugus Indian Reservation | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

***Haliaeetus leucocephalus***

Bald Eagle

| | | | | Office Use |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S2S3B,S2N - Imperiled | 11638 |
| **Federal Listing:** | Threatened | **Global Rank:** | G5 - Demonstrably secure | ESU |
| **Last Report:** | ** | **EO Rank:** | ** | USFWS |
| **County:** | Cattaraugus | | | |
| **Town:** | Dayton | | | |
| **Location:** | At, or in the vicinity of, the project site. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

These bird occurrences are within 10 miles of the project site.

***Haliaeetus leucocephalus***

| | | | | | |
|---|---|---|---|---|---|
| **Bald Eagle** | **NY Legal Status:** | Threatened | **NYS Rank:** | S2S3B,S2N - Imperiled | Office Use 12661 |
| | **Federal Listing:** | Threatened | **Global Rank:** | G5 - Demonstrably secure | ESU |
| | **Last Report:** | ** | **EO Rank:** | ** | USFWS |
| | **County:** | Chautauqua | | | |
| | **Town:** | Hanover | | | |
| | **Location:** | At, or in the vicinity of, the project site. | | | |
| | **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located, or the NYS DEC Endangered Species Unit at 518-402-8859. | | | |

9 Records Processed

More detailed information about many of the rare and listed animals in New York, including biology, identification, habitat, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org, from NatureServe Explorer at http://www.natureserve.org/explorer, and from NYSDEC at http://www.dec.ny.gov/animals/7494.html.

# Native American Heritage Correspondence

**ecology and environment, inc.**
International Specialists in the Environment
BUFFALO CORPORATE CENTER
368 Pleasant View Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

April 4, 2008

Ms. Kathleen Mitchell
Seneca Nation of Indians
Tribal Historic Preservation Office
467 Center Street
Salamanca, New York 14799

RE: Noble Ball Hill Windpark, Towns of Villenova and Hanover, Chautauqua County

Dear Ms. Mitchell:

On behalf of Noble Ball Hill Windpark, LLC (Noble), Ecology and Environment, Inc. (E & E) has been requested to initiate consultation with the Seneca Nation of Indians for the above referenced project. Although the proposed project area is not within or adjacent to Tribal lands, we wish to formally consult with you and the Nation concerning this project.

Noble is proposing to install and operate an approximately 100-megawatt (MW) wind energy facility (the "Project") in the Towns of Villenova and Hanover, Chautauqua County, New York (see enclosed maps). The facility would consist of up to 67 wind turbines, and electrical substation, and an interconnection to an existing transmission line. The project would be located on approximately 8,000 acres.

The Project includes the following:

- Installation and operation of up to 67 turbines;
- Construction and use of roads that will connect to each turbine to allow vehicles access for construction and maintenance of the facilities;
- Construction and use of an electrical collection system that will connect each turbine to an electrical substation that will allow delivery of electricity to the power grid; and
- Construction and operation of an electrical substation (approximately one-acre) and an approximately 6-mile 115-kV transmission line running from the southern border of the Town of Hanover northwest and connecting with the existing 230-kV transmission line.

Panamerican Consultants, Inc., based in Buffalo, will be completing cultural resource investigations including a Phase I Cultural Resources Investigation (archaeological survey) and a historic Architectural Survey of the proposed project area.

We welcome your consultation and any assistance you can provide us concerning this project. Once completed, report copies and/or reports presented in pdf format on a CD can be mailed to you upon request. If you have any questions or require any additional information, please do not hesitate to contact me.

Sincerely,

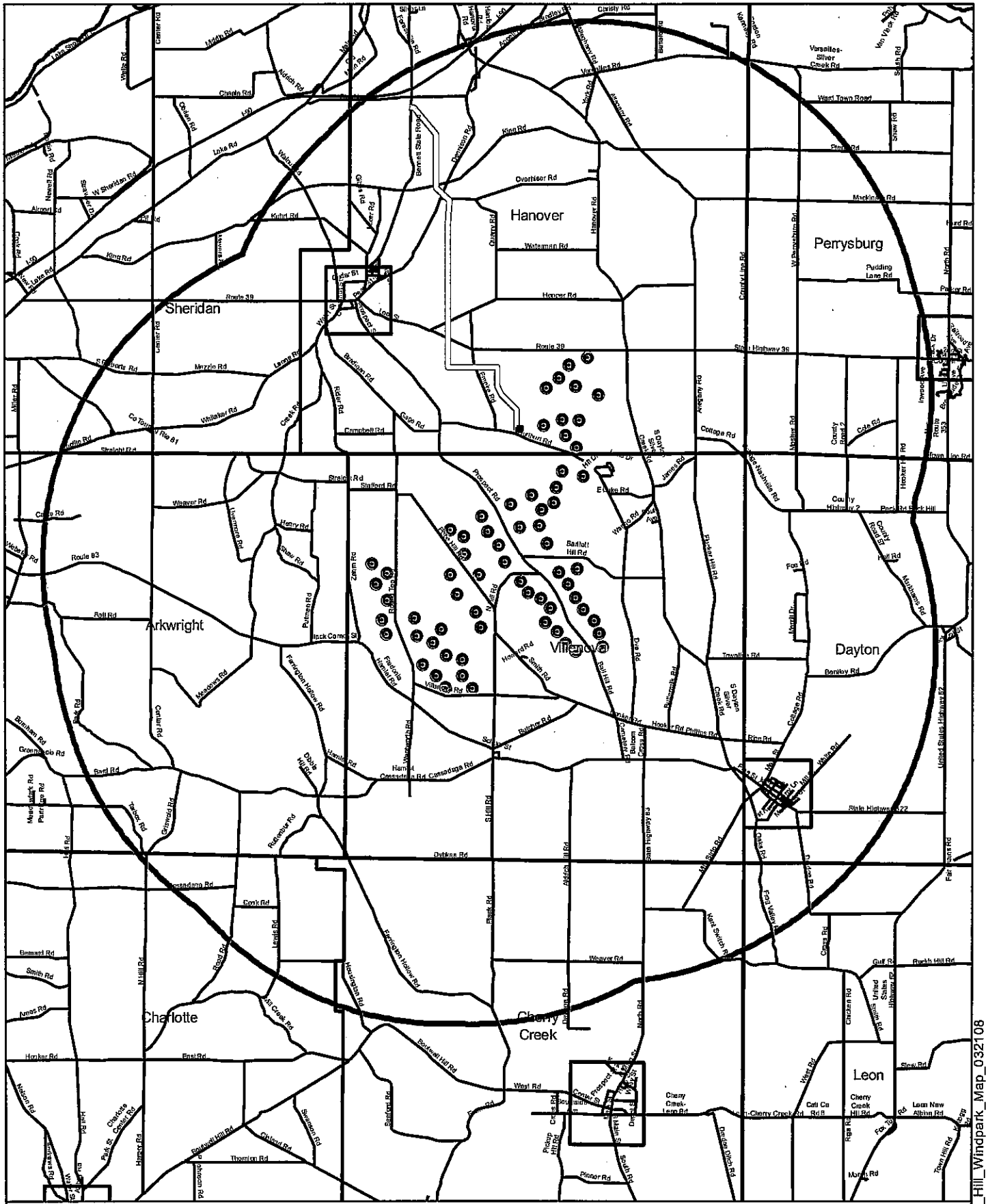
ECOLOGY AND ENVIRONMENT, INC.

Cory Zahm, AICP
Ball Hill Site Coordinator

Enc.

Cc: Michael Cinquino, Panamerican Consultants, Inc.
Kristin Hawley, Noble Environmental Power, LLC


Sheridan
Hanover
Arkwright
Villenova
Proposed Noble Ball Hill
Windpark Project Area
Towns of Villenova & Hanover,
Chautauqua County, NY
Turbine Locations
Substation
Transmission Line
Roads
N
Noble
ENVIRONMENTAL POWER
Proposed_Noble_Ball_Hill_Windpark_Project_Area_032008


Hanover
Perrysburg
Sheridan
Arkwright
Villenova
Dayton
Charlotte
Cherry Creek
Leon
Proposed Noble Ball Hill Windpark
Project Components and 5-Mile Radius
Towns of Villenova & Hanover,
Chautauqua County, NY
Turbine Locations
Substation
Transmission Line
Roads
5 Mile Turbine Buffer
N
Noble
ENVIRONMENTAL POWER
Proposed_Noble_Ball_Hill_Windpark_Map_032108

**ecology and environment, inc.**
International Specialists in the Environment
BUFFALO CORPORATE CENTER
368 Pleasant View Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

April 4, 2008

Ms. Christine Abrams
Tonawanda Band of Seneca Indians
Tonawanda Seneca Environmental Program
7027 Meadville Road
Basom, New York 14013

RE: Noble Ball Hill Windpark, Towns of Villenova and Hanover, Chautauqua County

Dear Ms. Abrams:

On behalf of Noble Ball Hill Windpark, LLC (Noble), Ecology and Environment, Inc. (E & E) has been requested to initiate consultation with the Tonawanda Band of Seneca Indians for the above referenced project. Although the proposed project area is not within or adjacent to Tribal lands, we wish to formally consult with you and the Tonawanda Band concerning this project.

Noble is proposing to install and operate an approximately 100-megawatt (MW) wind energy facility (the "Project") in the Towns of Villenova and Hanover, Chautauqua County, New York (see enclosed maps). The facility would consist of up to 67 wind turbines, and electrical substation, and an interconnection to an existing transmission line. The project would be located on approximately 8,000 acres.

The Project includes the following:

- Installation and operation of up to 67 turbines;
- Construction and use of roads that will connect to each turbine to allow vehicles access for construction and maintenance of the facilities;
- Construction and use of an electrical collection system that will connect each turbine to an electrical substation that will allow delivery of electricity to the power grid; and
- Construction and operation of an electrical substation (approximately one-acre) and an approximately 6-mile 115-kV transmission line running from the southern border of the Town of Hanover northwest and connecting with the existing 230-kV transmission line.

Panamerican Consultants, Inc., based in Buffalo, will be completing cultural resource investigations including a Phase I Cultural Resources Investigation (archaeological survey) and a historic Architectural Survey of the proposed project area.

We welcome your consultation and any assistance you can provide us concerning this project. Once completed, report copies and/or reports presented in pdf format on a CD can be mailed to you upon request. If you have any questions or require any additional information, please do not hesitate to contact me.

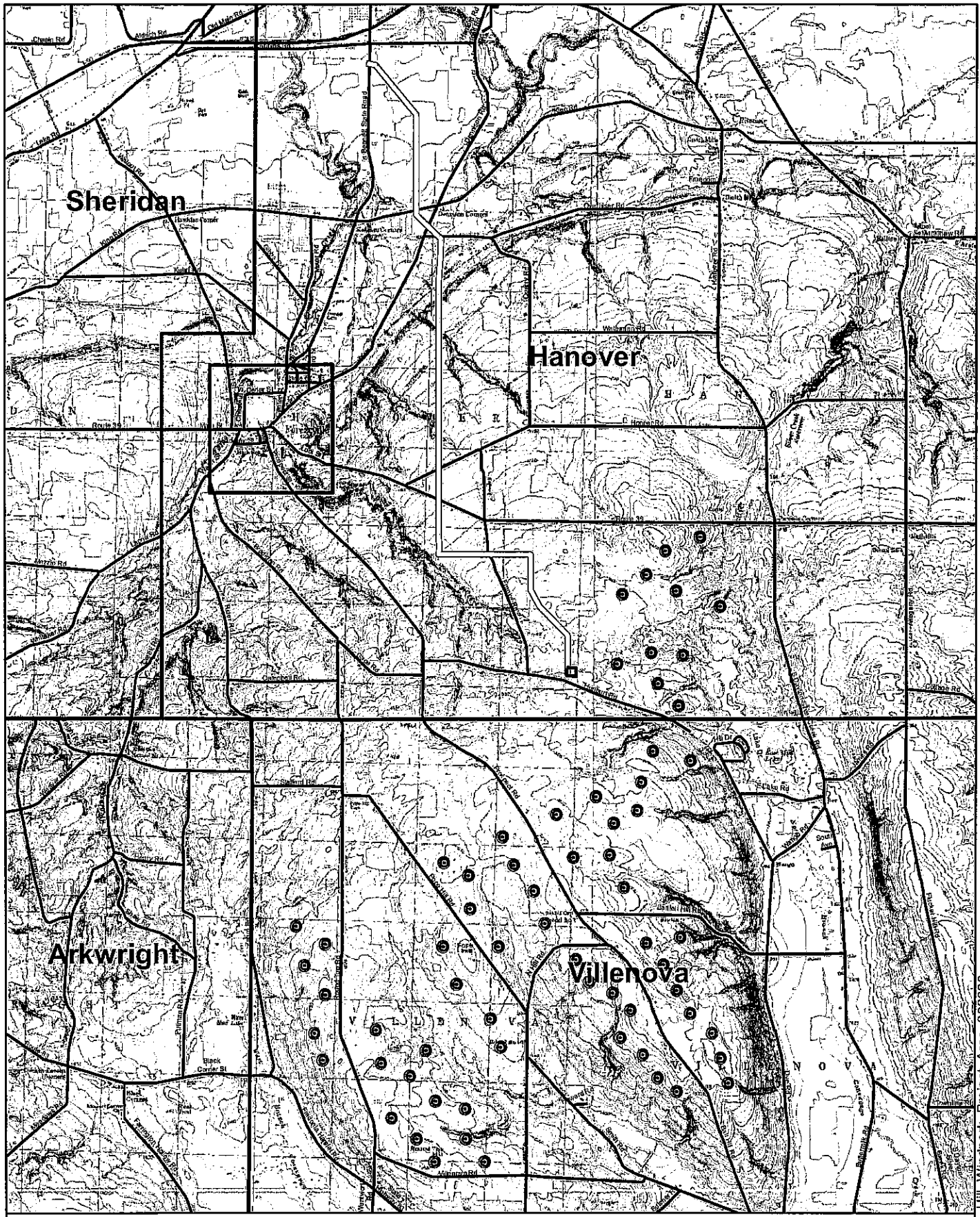
Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Cory Zahm, AICP
Ball Hill Site Coordinator

Enc.

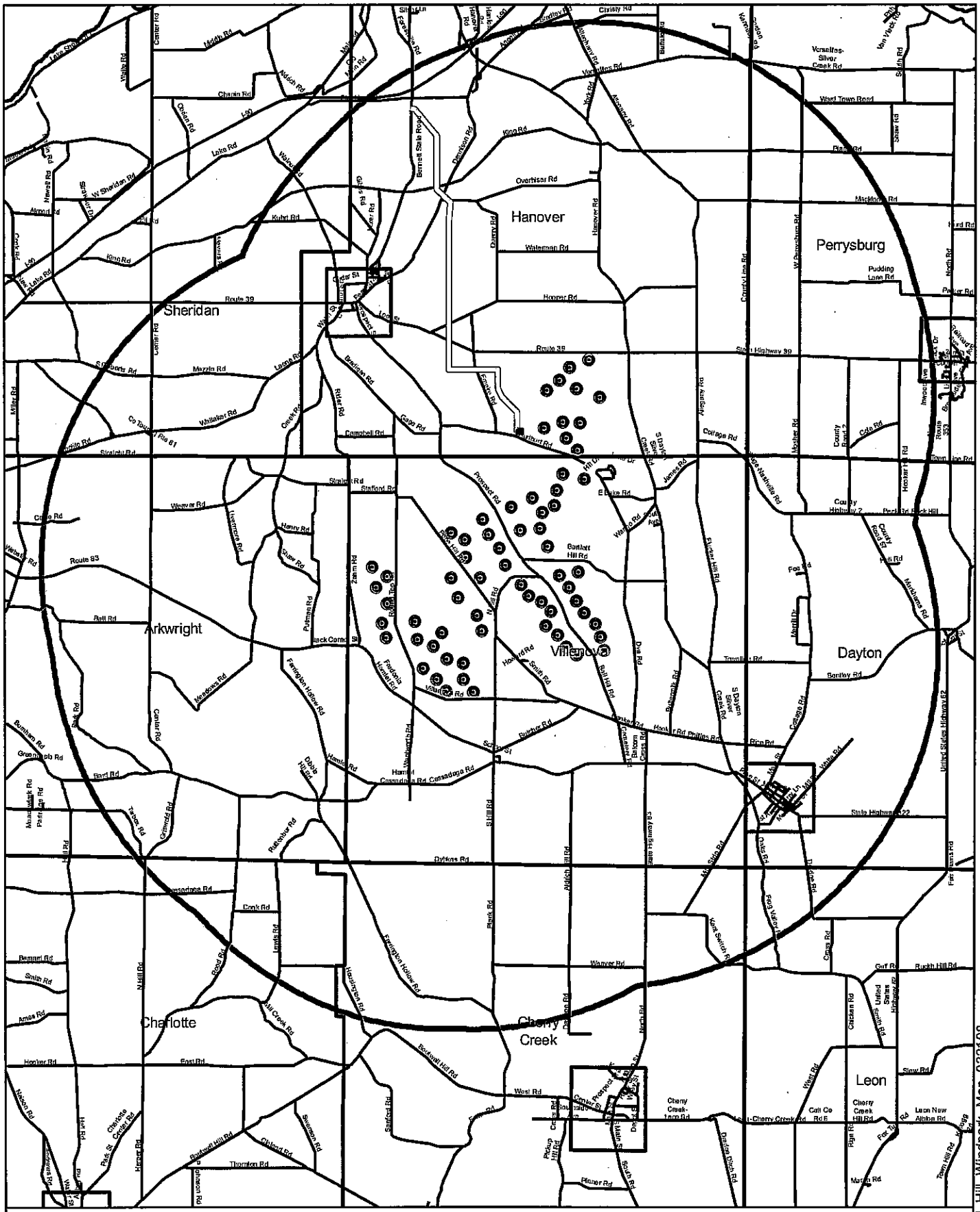
Cc: Michael Cinquino, Panamerican Consultants, Inc.
Kristin Hawley, Noble Environmental Power, LLC




**Proposed Noble Ball Hill Windpark Project Area**

Towns of Villenova & Hanover, Chautauqua County, NY

Proposed_Noble_Ball_Hill_Windpark_Project_Area_032008


Hanover
Perrysburg
Sheridan
Arkwright
Villenova
Dayton
Charlotte
Cherry Creek
Leon
Proposed Noble Ball Hill Windpark
Project Components and 5-Mile Radius
Towns of Villenova & Hanover,
Chautauqua County, NY
Turbine Locations
Substation
Transmission Line
Roads
5 Mile Turbine Buffer
N
Noble
ENVIRONMENTAL POWER
Proposed_Noble_Ball_Hill_Windpark_Map_032108

**ecology and environment, inc.**
International Specialists in the Environment

BUFFALO CORPORATE CENTER
368 Pleasant View Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

April 4, 2008

Mr. Neil Patterson
Tuscarora Nation
Tuscarora Environmental Program
2045 Upper Mountain Road
Sanborn, New York 14132

RE: Noble Ball Hill Windpark, Towns of Villenova and Hanover, Chautauqua County

Dear Mr. Patterson:

On behalf of Noble Ball Hill Windpark, LLC (Noble), Ecology and Environment, Inc. (E & E) has been requested to initiate consultation with the Tuscarora Nation for the above referenced project. Although the proposed project area is not within or adjacent to Tribal lands, we wish to formally consult with you and the Nation concerning this project.

Noble is proposing to install and operate an approximately 100-megawatt (MW) wind energy facility (the "Project") in the Towns of Villenova and Hanover, Chautauqua County, New York (see enclosed maps). The facility would consist of up to 67 wind turbines, and electrical substation, and an interconnection to an existing transmission line. The project would be located on approximately 8,000 acres.

The Project includes the following:

- Installation and operation of up to 67 turbines;
- Construction and use of roads that will connect to each turbine to allow vehicles access for construction and maintenance of the facilities;
- Construction and use of an electrical collection system that will connect each turbine to an electrical substation that will allow delivery of electricity to the power grid; and
- Construction and operation of an electrical substation (approximately one-acre) and an approximately 6-mile 115-kV transmission line running from the southern border of the Town of Hanover northwest and connecting with the existing 230-kV transmission line.

Panamerican Consultants, Inc., based in Buffalo, will be completing cultural resource investigations including a Phase I Cultural Resources Investigation (archaeological survey) and a historic Architectural Survey of the proposed project area.

We welcome your consultation and any assistance you can provide us concerning this project. Once completed, report copies and/or reports presented in pdf format on a CD can be mailed to you upon request. If you have any questions or require any additional information, please do not hesitate to contact me.

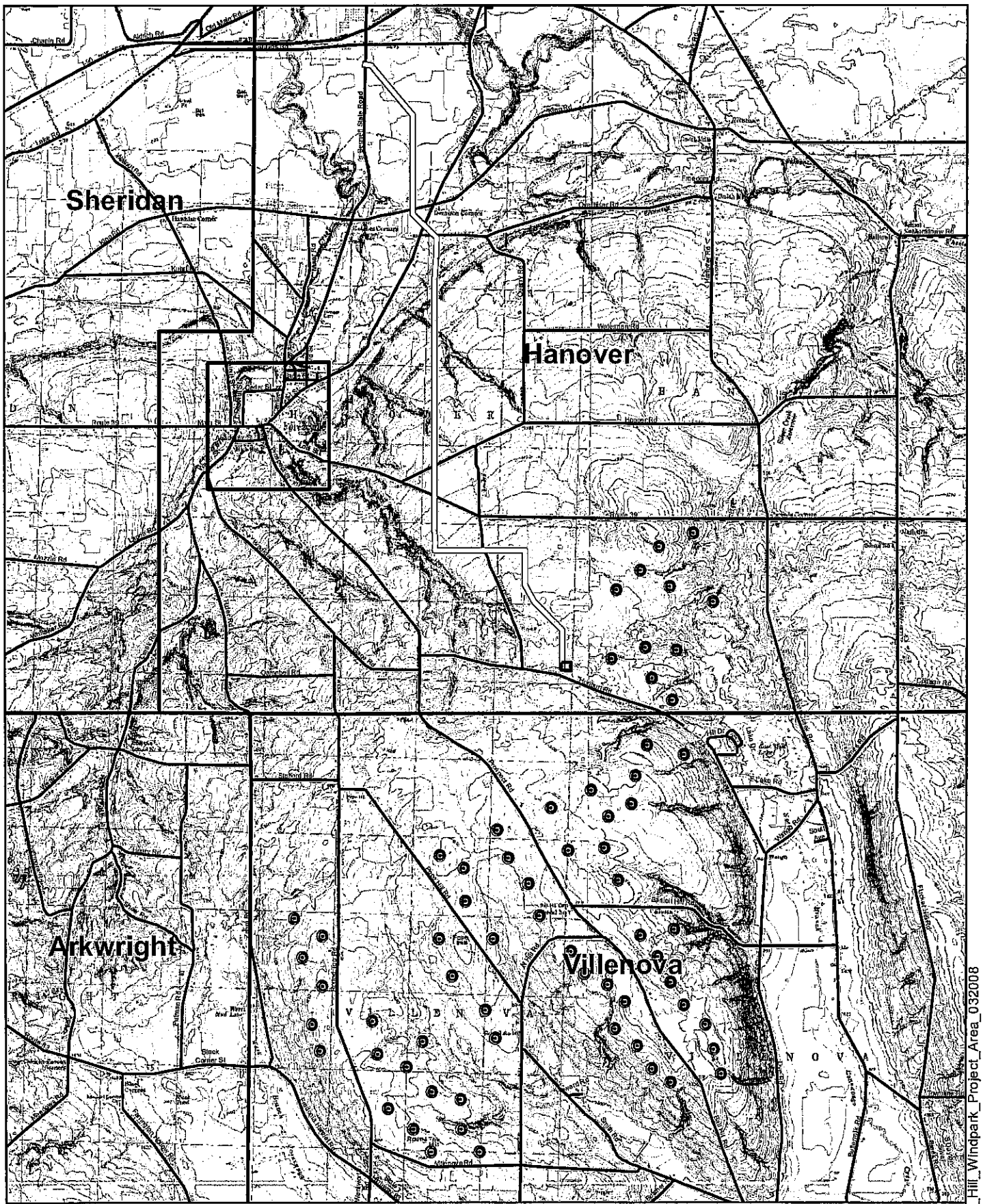
Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Cory Zahm, AICP
Ball Hill Site Coordinator

Enc.

Cc: Michael Cinquino, Panamerican Consultants, Inc.
Kristin Hawley, Noble Environmental Power, LLC


Sheridan
Hanover
Arkwright
Villenova
Proposed Noble Ball Hill
Windpark Project Area
Towns of Villenova & Hanover,
Chautauqua County, NY
Turbine Locations
Substation
Transmission Line
Roads
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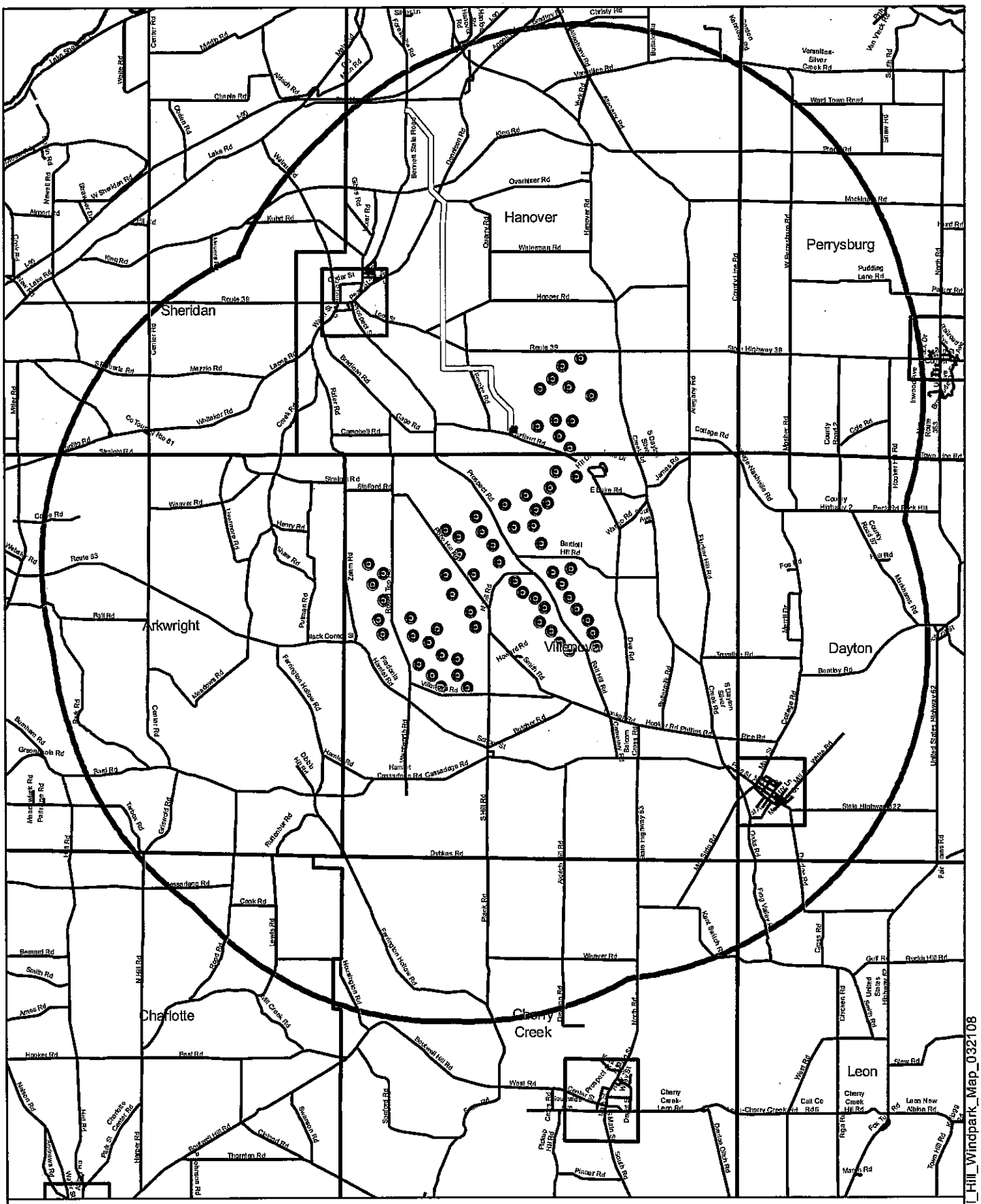
Noble
ENVIRONMENTAL POWER
Proposed_Noble_Ball_Hill_Windpark_Project_Area_032008


Hanover
Perrysburg
Sheridan
Arkwright
Villenova
Dayton
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Cherry Creek
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Proposed Noble Ball Hill Windpark
Project Components and 5-Mile Radius
Towns of Villenova & Hanover,
Chautauqua County, NY
Turbine Locations
Substation
Transmission Line
Roads
5 Mile Turbine Buffer
N
Noble
ENVIRONMENTAL POWER
Proposed_Noble_Ball_Hill_Windpark_Map_032108

# SHPO Correspondence

Noble
ENVIRONMENTAL POWER

Tel: 518 497 3414
Fax: 518 497 3421
7430 Route 11
Churubusco, NY 12923
www.noblepower.com

John Bonafide
New York State Office of Parks, Recreation,
and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island Resource Center
P.O. Box 189
Waterford, NY 12188-0189
March 21, 2008

RE: Noble Ball Hill Windpark, LLC

Dear Mr. Bonafide:

Noble is proposing to install and operate an approximately 100-megawatt (MW) wind energy facility (the "Project") in the Towns of Villenova and Hanover, Chautauqua County, New York (see enclosed maps). The facility would consist of up to 67 wind turbines, and electrical substation, and an interconnection to an existing transmission line. The project would be located on approximately 8000 acres.

The project includes the following:

-Installation and operation of up to 67 turbines;
-Construction and use of roads that will connect to each turbine to allow vehicles access for construction and maintenance of the facilities;
-Construction and use of an electrical collection system that will connect each turbine to an electrical substation that will allow delivery of electricity to the power grid; and
-Construction and operation of an electrical substation (approximately one-acre) and an approximately 6-mile 115Kv transmission line running from the southern border of Hanover northwest and connecting with the existing 230 kV transmission line.

The 1.5-megawatt (MW) turbine design features an enclosed monopole support tower, a nacelle atop each tower containing the electrical generating equipment, and a three-bladed rotor attached to the nacelle. The diameter of the rotor/blade assembly will be approximately 253 feet. The maximum height of these structures is assumed to be approximately 389 feet at the maximum extension of a given blade. Once installed, each wind turbine will occupy a round, slightly exposed base approximately 18 feet in diameter. The total length of the linear components of the project (i.e., access roads and electrical cables will be approximately 25 miles. The enclosed maps outline the five mile radius around the project area. The areas of disturbance are expected to be about two acres around each turbine and an average width of about 60 feet along the new access roads. When the design is completed, maps will be provided to detail disturbance areas.

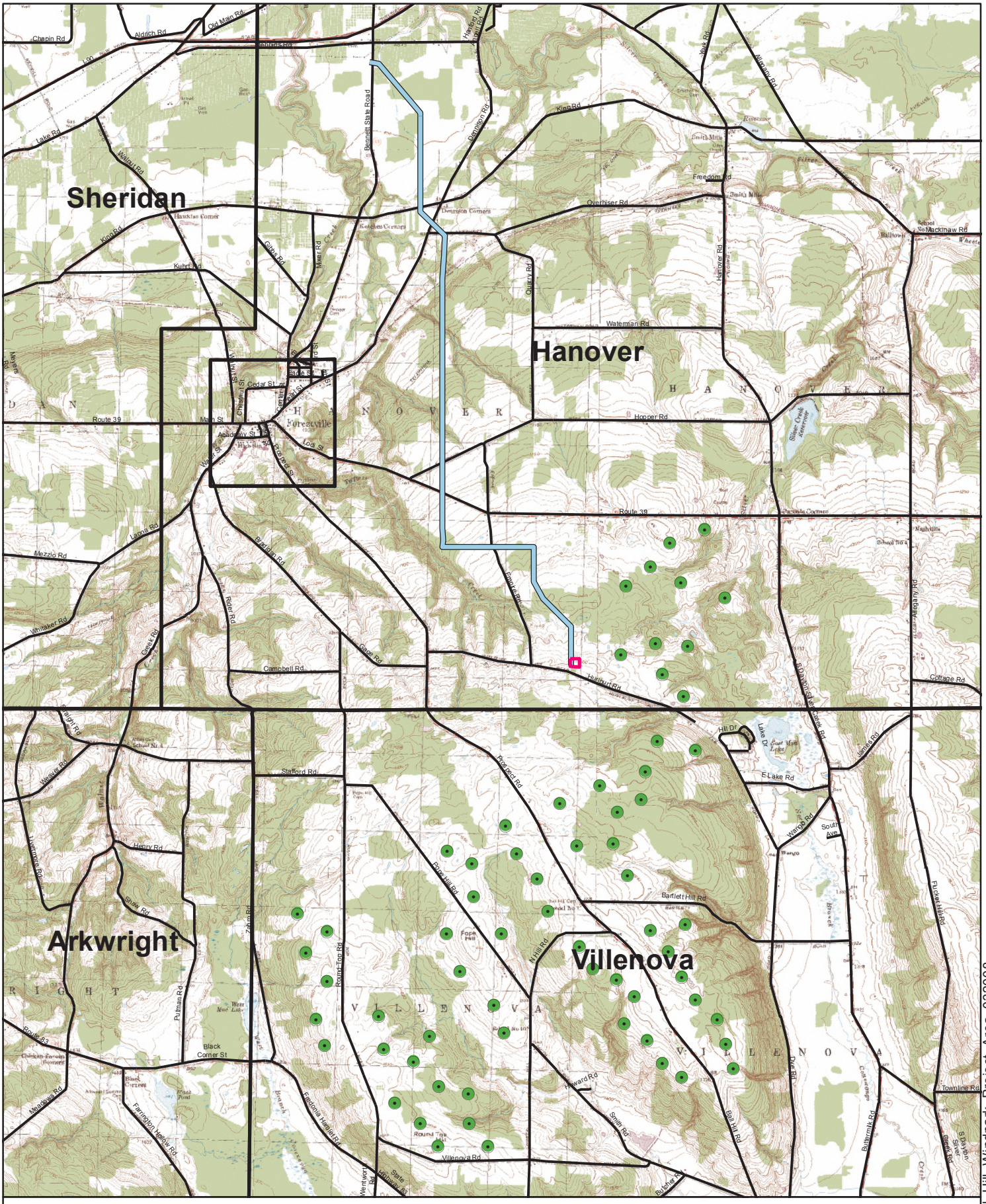
We request your comments on the proposed undertaking and ask you to make recommendations pertaining to this action. The contracted consultant for this project will be Michael Cinquino, of Panamerican Consultants, Inc. The Project Developer will be Lael Eason (860) 227-9120, and the Environmental Project Manager will be Kristin Hawley, both of Noble Environmental Power. If you have any questions or concerns, please do not hesitate to contact me at (518) 497-3414.

Sincerely,

Kristin Hawley

Sandy Sayyeau
Vice President of Environmental Affairs
Noble Environmental Power
PO Box 235
Churubusco, NY 12923

Cc:
Daniel McEneny
Dr. Nancy Herter
Michael Cinquino

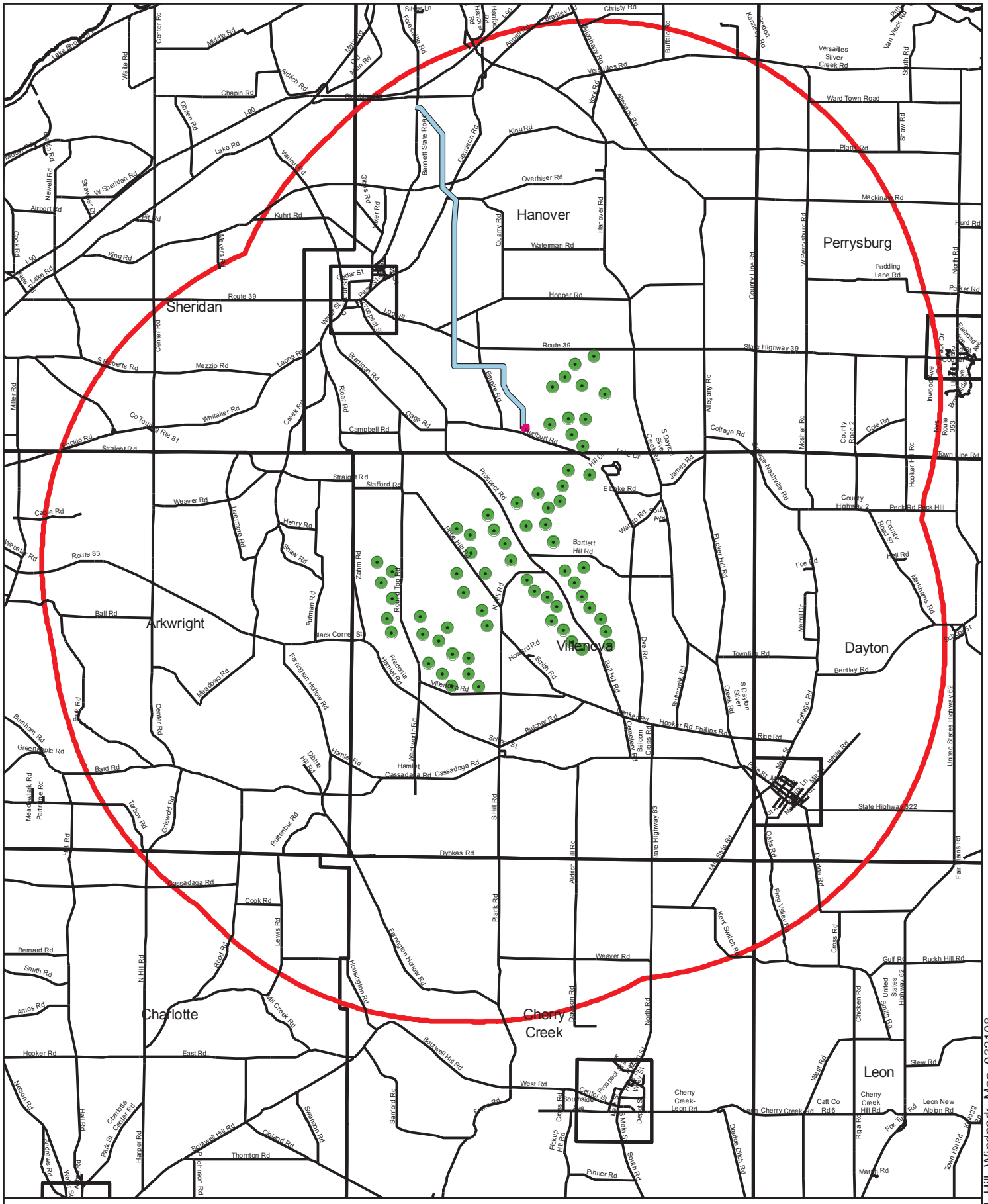



**Proposed Noble Ball Hill Windpark Project Area**

**Towns of Villenova & Hanover, Chautauqua County, NY**

Noble ENVIRONMENTAL POWER

Proposed_Noble_Ball_Hill_Windpark_Project_Area_032008


Hanover
Perrysburg
Sheridan
Arkwright
Villenova
Dayton
Charlotte
Cherry Creek
Leon
Route 39
Route 83
State Highway 39
State Highway 322
United States Highway 62
Lake Shore Rd
Middle Rd
Chapin Rd
Aldrich Rd
Lake Rd
King Rd
Overhiser Rd
Waterman Rd
Hopper Rd
Mackinaw Rd
Ward Town Road
Plank Rd
Shaw Rd
Versailles-Silver Creek Rd
Pudding Lane Rd
Parker Rd
Hurd Rd
North Rd
Cottage Rd
Cole Rd
Town Line Rd
Peck Rd
Buck Hill Rd
Hall Rd
Foe Rd
Meadowlawn Rd
Bentley Rd
Rice Rd
Phillips Rd
Hooker Rd
Cassadaga Rd
Dybkas Rd
Weaver Rd
Gulf Rd
Ruckh Hill Rd
Slew Rd
Leon New Albion Rd
Cherry Creek-Leon Rd
Cherry Creek Hill Rd
Catt Co Rd 6
Fox Rd
Rega Rd
Kellogg Rd
Town Hill Rd
Marsh Rd
Pinner Rd
South Rd
West Rd
East Rd
Hooker Rd
Ames Rd
Bernard Rd
Smith Rd
Cook Rd
Bard Rd
Greenapple Rd
Burnham Rd
Ball Rd
Straight Rd
Stafford Rd
Weaver Rd
Cattle Rd
Webster Rd
Whitaker Rd
Mezzio Rd
S Roberts Rd
Co Touring Rte 81
Campbell Rd
Gage Rd
Bratdrun Rd
Rider Rd
Creek Rd
Laona Rd
Center Rd
Miller Rd
Newell Rd
W Sheridan Rd
Airport Rd
Cook Rd
Walnut Rd
Kuhnt Rd
Quarry Rd
Hanover Rd
Bennett State Road
Dennison Rd
Allegany Rd
York Rd
Buffalo Rd
Christy Rd
Hanover Rd
Angell Rd
Bradley Rd
Hurlburt Rd
Prospect Rd
Bartlett Hill Rd
Rocky Hill Rd
Robert Top Rd
Zahm Rd
Henry Rd
Lakemore Rd
Putnam Rd
Black Corners St
Howard Rd
Smith Rd
Ball Hill Rd
Dake Rd
Townline Rd
Merrill Dr
Rucker Hill Rd
Meadowlawn Rd
Soft Rd St
Farrington Hollow Rd
Frederick Hamlet Rd
Villenova Rd
Hamlet
Cassadaga Rd
Dibble Hill Rd
Hamlet Rd
Westworth Rd
Schutt St
Rutcher Rd
Hunker Rd
Canterbury Balcom Cross Rd
Butterhill Rd
S Dayton Silver Creek Rd
Cottage Rd
White Rd
Meadowlark Rd
Partridge Rd
Tarbox Rd
Griswold Rd
Hill Rd
Rutenbur Rd
S Hill Rd
Aldrich Hill Rd
Oaks Rd
Mt Evan Rd
Kent Switch Rd
Frog Valley Rd
Cross Rd
Chicken Rd
Dunkirk Rd
United States Highway 62
Fair Plains Rd
Rapp Rd
N Hill Rd
Good Rd
Lewis Rd
Mill Creek Rd
Housington Rd
Bank Rd
Dunkirk Rd
North Rd
Boutwell Hill Rd
Sanford Rd
Swanson Rd
Cleland Rd
Thornton Rd
Johnson Rd
Harper Rd
Park St
Cherbitte Center Rd
Nelson Rd
Hill Rd
Academy St
Main St
Center St
Prospect St
Depot St
Cassadaga Creek
Pickup Hill Rd
Dunkirk Drain Rd
Inwood Dr
Railroad Ave
Bay View Dr
Lakeview Ave
Cole Rd
County Road 2
County Road 57
County Highway 2
Hooker Hill Rd
Mosher Rd
W Perrysburg Rd
County Line Rd
Allegany Rd
Cottage Rd
James Rd
E Lake Rd
Warren Rd
Hill Dr
Lake Dr
S Dayton Silver Creek Rd
Foe Rd
Merrill Dr
Meadowlawn Rd
Soft Rd St
Townline

**David A. Paterson**
Governor

**Carol Ash**
Commissioner

# New York State Office of Parks, Recreation and Historic Preservation

Historic Preservation Field Services Bureau -Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643
www.nysparks.com

April 4, 2008

Noble Environmental Power
RECEIVED
APR 10 2008
Churubusco, NY

Sandy Sayyeau
Noble Environmental Power
PO Box 235
Churubusco, New York 12923

Re: PSC
Bald Hill Wind Farm/100 MW/67 Turbines
Multiple Locations
HANOVER, VILLENOVA, Chautauqua County
08PR01814

Dear Ms. Sayyeau:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP) concerning your project's potential impact/effect upon historic and/or prehistoric cultural resources.

As in past projects, the first step in the identification process is to have your consultant(s) discuss the survey methodologies for both archaeological and building resources with this office. I have attached our standard Guidelines for Wind Farm Development Cultural Resources Survey Work (2006) for your reference.

At this point in time we have not been contacted by either State or Federal Agencies that may be responsible to review and/or permit your project. If and when such agencies undertake their reviews either under Section 14.09 of New York State Parks and Recreation Law or Section 106 of the National Historic Preservation Act they may require additional survey work be undertaken.

If I can be of any further assistance do not hesitate to contact me at (518) 237-8643, ext. 3263.

Sincerely,

John A. Bonafide
Historic Preservation Services
Coordinator

# New York State Historic Preservation Office
# Guidelines for Wind Farm Development Cultural Resources Survey Work

The New York State Historic Preservation Office has established the following guidelines for the assessment of historic and cultural resources associated with the development of wind farm projects in New York State.

## Survey for Historic Buildings

1. Establish a five-mile Area of Potential Effect (APE) around the project site.
    i. Establish boundary of APE using topographic survey to determine where project may be visible from.

2. Conduct field survey within the positive visual APE as defined by topographic study.

3. Using NYSHPO data, the survey will initially identify all buildings/sites within the study area that were previously determined eligible for inclusion in or are already listed in the New York State and National Registers of Historic Places.

4. The survey will assess all buildings 50 years old or older within the study area. Surveyors will determine potential State and National Register eligibility of each resource using the National Register Criteria for Evaluation.
    i. Surveyor will schedule a meeting with NYSHPO staff prior to undertaking survey work to verify the APE.
    ii. Surveyor will schedule a meeting with NYSHPO staff after completion of survey of mile-1 "ring" of study area to verify eligibility determination methodology. Meeting will review properties determined eligible and will provide a sampling of resources determined not-eligible.
    iii. After evaluation methodology is verified by the NYSHPO, survey of remaining APE area will be completed.
    iv. All properties previously listed in the State and/or National Registers in addition to all properties determined eligible prior to the survey and as part of the project survey are to be marked using a single GPS point. The single point should be taken at the edge of the property generally at the mid-point of the property's street frontage.
    v. The GPS data will be linked to the street address and/or SHPO Unique Site Number (if one already exists).
    vi. All survey data will be provided to the NYSHPO in a standardized format that will be discussed at the initial pre-survey meeting.

**Archaeological Survey**

1. Phase I Archaeological Survey is recommended for all wind farm project areas.

2. Archaeological Survey will be limited to the *Archaeological* Area of Potential Effect (APE) associated with the construction of the project. This smaller core of the project APE is composed of areas that will experience ground disturbing activity during the construction phase of the project. These areas include but are not limited to:
    i. Turbine sites
    ii. Construction staging areas
    iii. Borrow pits
    iv. New/Access Roads
    v. Utility corridors
    vi. New building locations
    vii. Other areas where the current ground surface may be modified as a result of the project.

3. Phase I survey will be conducted by sampling Environmental Zones. Necessary steps in this process include:
    i. Determining the total acreage of the *Archaeological* APE.
    ii. Determining the total number of shovel tests recommended for the *Archaeological* APE by multiplying the acreage by 16 shovel tests per acre.
    iii. Identifying the various environmental zones within the *Archaeological* APE following Robert E. Funk's 1993 work, *Archaeological Investigations in the Upper Susquehanna Valley, New York State* (Chapter 5).

4. Once the zones are defined, the archaeological consultant will divide up the total number of shovel tests previously determined and apply an equal percentage of tests to each defined environmental zone. Any previously identified archaeological site(s) or map documented structure (MDS) must be included in the Phase IB testing.

5. Within each zone shovel testing will be conducted using a five meter interval or other acceptable methods such as plowing/disking for previously plowed farm land.

6. Prior to implementing a proposed testing methodology the project consultant will schedule a meeting with SHPO staff to consult on the proposed plan. A copy of the plan will be provided for SHPO staff review in advance of the meeting.

7. Sites, identified as part of the survey process will be documented using standard practices (such as site forms or approved data bases) and will all be located using a single GPS point.

8. Once the Phase I survey is completed a report will be provided to the SHPO using the established New York SHPO Phase I Archaeological Report Format Requirements and the Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State.

**Electronic Survey Data**

1. Project sponsors will provide the following data sets to the SHPO as part of their submission. Sponsors or their consultants should contact the SHPO staff to verify specific data requirements.
    i. GIS data coverage defining the five-mile survey area.
    ii. GIS data locating (as best as practical) each of the proposed tower locations.
    iii. GPS data locating by singe point each building, structure, object or site identified as being eligible for or listed in the New York State and/or National Registers of Historic Places.
    iv. GIS data locating the boundary of all archaeologically tested areas.
    v. Final archaeological reports should be provided in bound format (see New York SHPO Phase I Archaeological Report Format Requirements) as well as in PDF format on CD.

2. Project's consultant should contact SHPO staff to determine exact format of data to be submitted.

For more information about the New York State Historic Preservation Office, please call us at 518-237-8643 or visit our web site at **http://nysparks.state.ny.us** then select **HISTORIC PRESERVATION.** Select the **On Line Resources** option to find specific information regarding historic and cultural resources in any community in the state.

## Kristin Hawley

**From:** Michael Cinquino [mcinquino@panamconsultants.com]
**Sent:** Tuesday, August 19, 2008 4:09 PM
**To:** Kristin Hawley; Patrick McCarthy
**Subject:** Fw: Noble Ball Hill Windpark, (08PR1814)

**From:** Nancy.Herter@oprhp.state.ny.us
**Sent:** Tuesday, August 19, 2008 2:26 PM
**To:** mcinquino@panamconsultants.com
**Subject:** Noble Ball Hill Windpark, (08PR1814)

Dear Mike,

**Re:** PSC
Noble Ball Hill Windpark
Towns of Villenova and Hanover
Chautauqua County, New York

The Office of Parks, Recreation and Historic Preservation (OPRHP) has reviewed the Phase I Cultural Resources Investigation for the above referenced project and we have no further archaeological concerns with this document.

We understand that the Area of Potential Effect (APE) has been increased by 20 acres and that the OPRHP will be receiving an addendum phase I report.

Sincerely,
Nancy

Nancy Herter
Historic Preservation Program Analyst, Archaeology
Office of Parks, Recreation and Historic Preservation
Field Services Bureau
PO Box 189, Peebles Island
Waterford, New York 12188-0189
(518) 237-8643 ext. 3280
(518) 233-9049 (fax)

# USFWS Correspondence

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

January 19, 2007

Ms. Christine Sousa
Biologist
Ecology & Environment, Inc.
368 Pleasant View Drive
Lancaster, NY 14086

Dear Ms. Sousa:

This responds to your September 18, 2006, letter regarding a proposed wind farm in the Town of Arkwright, Chautauqua County, New York. It appears that the proposed project may affect species under U.S. Fish and Wildlife Service (Service) jurisdiction under the Migratory Bird Treaty Act (MBTA) (40 Stat. 755; 16 U.S.C. 703-712). However, further information is necessary to adequately make any determinations. This additional information includes a more detailed project description (*e.g.*, estimate of the operational lifespan of the project, location of turbines, as well as information on bird and bat use within the project area). We received a proposed work plan for bird and bat studies for the proposed project in a September 19, 2006, letter from Ms. Sandy Sayyeau of Noble Environmental Power.

We are providing the following comments as technical assistance pursuant to the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). In addition to these comments, we may provide additional future comments under other legislation, such as the MBTA and/or Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

Except for occasional transient individuals, no Federally-listed or proposed endangered or threatened species under our jurisdiction are known to exist within the project impact area. In addition, no habitat in the project impact area is currently designated or proposed "critical habitat" in accordance with provisions of the ESA. Therefore, no further ESA coordination or consultation with the Service is required. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of Federally-listed and proposed endangered and threatened species in New York is available for your information.* Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current.* We highly recommend that you check our website before submitting future requests.*

For additional information on fish and wildlife resources or State-listed species, we suggest you contact the appropriate NYSDEC regional office(s) and the New York Natural Heritage Program Information Services.*

Work in certain waters of the United States, including wetlands and streams, may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without recommending additional permit conditions, or recommend denial of the permit depending upon potential adverse impacts on fish and wildlife resources associated with project construction or implementation. The need for a Corps permit may be determined by contacting the appropriate Corps office(s).* In addition, should any part of the proposed project be authorized, funded, or carried out, in whole or in part, by a Federal agency, such as the Corps, further consultation between the Service and that Federal agency pursuant to the ESA may be necessary.

Thank you for your time. If you require additional information please contact Robyn Niver at (607) 753-9334. Future correspondence with us on this project should reference project file 61687.

Sincerely,

David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at:
http://www.fws.gov/northeast/nyfo/es/section7.htm

cc: NYSDEC, Allegany, NY (Env. Permits)
NYSDEC, Albany, NY (Endangered Species; Attn: P. Nye, Env. Permit; Attn: S. Tomasik)
NYSDEC, Albany, NY (Natural Heritage)

ecology and environment, inc.
International Specialists in the Environment

**BUFFALO CORPORATE CENTER**
368 Pleasant View Drive, Lancaster, New York 14086
Tel: (716) 684-8060, Fax: (716) 684-0844

May 19, 2008

Mr. David Stilwell
United States Fish and Wildlife Service
3817 Luker Road
Cortland, NY 13045

Re: Noble Environmental Power LLC., Town of Villenova, Chautauqua County, NY

Dear Mr. Stilwell:

Ecology & Environment, Inc. (E & E), on behalf of Noble Environmental Power LLC (Noble), is preparing a Draft Environmental Impact Statement (DEIS) for a potential wind energy facility in the Town of Villenova, Chautauqua County, New York. The project, if implemented, would include approximately 70 wind turbines and associated access roads and collection lines.

E & E requested your assistance in identifying federally-listed threatened or endangered species, significant or critical habitats, natural areas, or other wildlife or fisheries features that may occur within the identified project area in a letter dated September 1, 2006. We have not received a response to that request.

We have conducted a web-search utilizing the County List of Threatened, Endangered and Candidate species for New York State. Two federally listed mussels were identified within Chautauqua County, clubshell (*Pleurobema clava*) and rayed bean (*Villosa fabalis*), both of which inhabit streams with sand or gravel substrate. Additionally, the bald eagle (Haliaetus leucocephalus) which is protected under the Bald and Golden Eagle Protection Act was identified in Chautauqua County. A detailed bird and bat study has been conducted at the Project Area and the resulting study report will be forwarded to the Service for review once it is finalized.

At this time we request more detailed information about the known occurrence of clubshell and rayed bean mussels in the vicinity of the Project. We also request any updated information on protected or candidate species known to occur in the vicinity of the Project.

Enclosed is an updated figure of the proposed project area to aid in your evaluation of the project. The figure is a composite of the Cherry Creek (1990), Forestville (1990), Perrysburg (1990), and Hamlet (1990) 7.5 minute USGS topographic quadrangle maps.

If you have any questions regarding this data request, or require additional project information, please do not hesitate to call me at 716-684-8060 or contact me by e-mail at lweaver@ene.com. Thank you very much for your attention to this request. We look forward to receiving your input on this project.

Sincerely,
ECOLOGY & ENVIRONMENT, INC.



Laurie Weaver
Biologist

Enc.: (1)
CC: Kristin Hawley; Noble Environmental Power, LLC.
Cory Zahm; Ecology & Environment Inc.

© Ecology & Environment, Inc. GIS Department Project #00227.NP20.02.02
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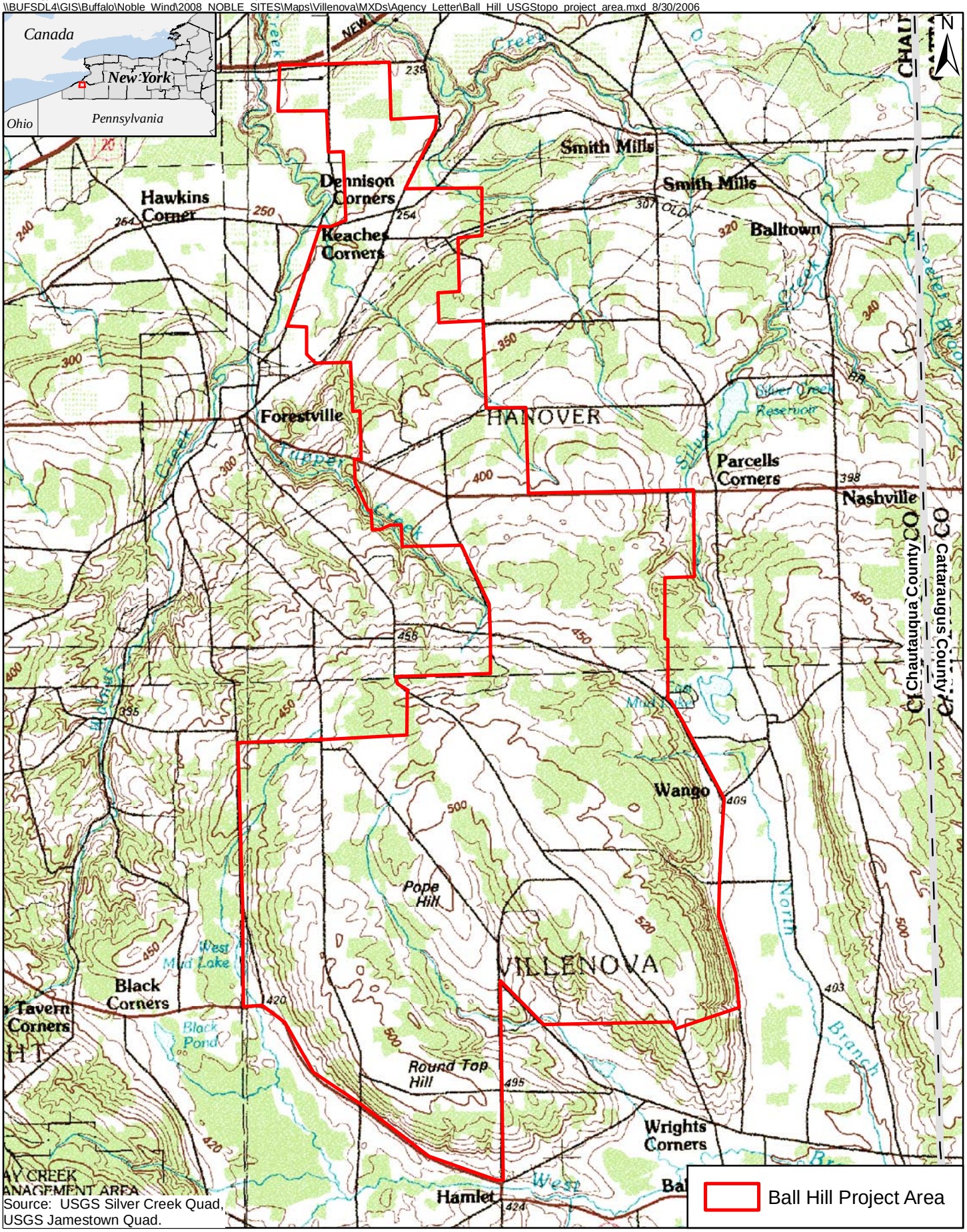


Source: USGS Silver Creek Quad, USGS Jamestown Quad.

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

**Ball Hill Windpark**
**1:100,000 USGS Topographic Map**

# D SEQRA Documentation

**Complete EAF**

**617.20**
**Appendix A**
**State Environmental Quality Review**
# FULL ENVIRONMENTAL ASSESSMENT FORM

**Purpose:** The full EAF is designed to help applicants and agencies determine, in an orderly manner, whether a project or action may be significant. The question of whether an action may be significant is not always easy to answer. Frequently, there are aspects of a project that are subjective or immeasurable. It is also understood that those who determine significance may have little or no formal knowledge of the environment or may not be aware of the broader concerns affecting the question of significance.

The full EAF is intended to provide a method whereby applicants can be assured that the determination process has been orderly, comprehensive in nature, yet flexible enough to allow introduction of information to fit a project or action.

**Full EAF Components:** The full EAF is comprised of three parts:

**Part 1:** Provides objective data and information about a given project and its site. By identifying basic project data, it assists a reviewer in the analysis that takes place in Parts 2 and 3.

**Part 2:** Focuses on identifying the range of possible impacts that may occur from a project or action. It provides guidance as to whether an impact is likely to be considered small to moderate or whether it is a potentially-large impact. The form also identifies whether an impact can be mitigated or reduced.

**Part 3:** If any impact in Part 2 is identified as potentially-large, then Part 3 is used to evaluate whether or not the impact is actually important.

## DETERMINATION OF SIGNIFICANCE – Type 1 and Unlisted Actions

**Identify the Portions of EAF completed for this project:** ☒ Part 1 ☐ Part 2 ☐ Part 3

Upon review of the information recorded on this EAF (Parts 1 and 2 and 3 if appropriate), and any other supporting information, and considering both the magnitude and importance of each impact, it is reasonably determined by the lead agency that:

☐ A. The project will not result in any large and important impact (s) and, therefore, is one which **will not** have a significant impact on the environment, therefore **a negative declaration will be prepared)**.

☐ B. Although the project could have a significant effect on the environment, there will not be a significant effect for the Unlisted Action because the mitigation measures described in PART 3 have been required, therefore a CONDITIONED negative declaration will be prepared.*

☒ C. The project may result in one or more large important impacts that may have significant impact on the environment, therefore a positive declaration will be prepared.

*A Conditioned Negative Declaration is only valid for Unlisted Actions

**Application for Wind Energy Permit**
Name of Action

**Town of Villenova**
Name of Lead Agency

| **Yvonne M. Park** | **Supervisor** |
|---|---|
| Print or Type Name of Responsible Officer in Lead Agency | Title of Responsible Officer |
| Signature of Responsible Officer in Lead Agency | Signature of Preparer (If different from responsible officer) |

**May 2008**
Date

# PART 1 – PROJECT INFORMATION

**Prepared by Project Sponsor**

NOTICE: This document is designed to assist in determining whether the action proposed may have a significant effect on the environment. Please complete the entire form, Parts A through E. Answers to these questions will be considered as part of the application for approval and may be subject to further verification and public review. Provide any additional information you believe will be needed to complete Parts 2 and 3.

It is expected that completion of the full EAF will be dependent on information currently available and will not involve new studies, research or investigation. If information requiring such additional work is unavailable, so indicate and specify each instance.

| | | |
|---|---|---|
| NAME OF ACTION<br>**Noble Ball Hill Windpark** | | |
| LOCATION OF ACTION (Include Street Address, Municipality and County)<br>**Towns of Villenova and Hanover, Chautauqua County** | | |
| NAME OF APPLICANT/SPONSOR<br>**Noble Ball Hill Windpark, LLC** | BUSINESS TELEPHONE<br>**(585) 322-7675** | |
| ADDRESS<br>**7294 Centerville Road** | | |
| CITY/PO<br>**PO Box 72, Bliss** | STATE<br>**NY** | ZIP CODE<br>**14024** |
| NAME OF OWNER (If different)<br>**N/A** | BUSINESS TELEPHONE<br>**( )** | |
| ADDRESS | | |
| CITY/PO | STATE | ZIP CODE |

DESCRIPTION OF ACTION

**Noble Ball Hill Windpark, LLC (Noble) is proposing to construct and operate an approximately 93 megawatt (MW) wind energy facility (the Project) in the towns of Villenova and Hanover, Chautauqua County. The wind energy generation component of the Project will be located in both Villenova and Hanover. The transmission component of the Project will be located in Hanover only. The Project consists of the following:**

**1) Installation and operation of 62 wind turbines (51 turbines in Villenova and 11 turbines in Hanover);**
**2) Construction and use of approximately 17 miles of access roads (13 miles in Villenova and 4 miles in Hanover). During construction, 35-foot wide temporary roads located within a 60-foot wide construction corridor will connect to each wind turbine to allow vehicle access to the facilities. After construction, the roads will be scaled back to 16 feet allowing Noble to use the existing roadway for maintenance and operational purposes; and**
**3) Construction and use of an electrical collection system (approximately 7.3 miles [6 miles in Villenova and 1.3 miles in Hanover]) that will allow delivery of electricity to the power grid. Where practicable, the electrical collection system will be installed along the same right-of-way corridor as the access roads.**
**4) Construction and use of a new substation in the town of Hanover that will tie into a new 115-kilovolt (kV) transmission line. The substation footprint will be approximately 300 by 400 feet;**
**5) Construction and use of a new switchyard in the town of Hanover. The switchyard footprint will be approximately 300 by 500 feet;**
**6) Construction and use of an approximately 5.8-mile overhead 115-kV transmission line, sited entirely in the town of Hanover to transfer the energy to the proposed switchyard to provide access to the grid. New overhead poles and lines will be installed between the Hanover substation and an existing National Grid transmission line in Hanover.**

**Each turbine will consist of an enclosed monopole support tower, a nacelle atop each tower containing the electrical generating equipment, and a three-blade rotor attached to the nacelle. Each wind turbine will have a maximum generating capacity of approximately 1.5 MW.**

**Please Complete Each Question – Indicate N.A. if not applicable**

## A. Site Description

Physical setting of overall project, both developed and undeveloped areas.

1. Present land use: ☐Urban ☐Industrial ☐Commercial ☐Residential (suburban) ☒Rural (non-farm) ☒Forest ☒Agriculture ☐Other_____

2. Total acreage of project area: **approx. 13,101** acres Includes all acreage within Project Area Boundary as shown in attachment C

| APPROXIMATE ACREAGE | PRESENTLY | AFTER COMPLETION |
|---|---|---|
| Meadow or Brushland (Non-agricultural) | **383** acres | **376** acres |
| Forested | **7,044** acres | **6,925** acres |
| Agricultural (Includes orchards, cropland, pasture, etc.) | **5,202** acres | **5,054** acres |
| Wetland (Freshwater of tidal as per Articles 24, 25 of ECL | **98** acres | **97** acres |
| Water Surface Area | **4** acres | **4** acres |
| Unvegetated (Rock, earth or fill) | **0** acres | **0** acres |
| Roads, buildings and other paved surfaces | **17** acres | **17** acres |
| Other (Indicate type) Developed, open space | **354** acres | **629** acres |

3. What is predominant soil type(s) on project site? **Busti silt loam 3-8% and 8-15% slopes, Chautauqua silt loam 3-8% and 8-15% slopes, Fremont silt loam 3-8 % slopes and 0-3% slopes, Erie silt loam, 3-8% slopes**
   a. Soil drainage: ☒Well drained **18**% of site ☒Moderately well drained **26**% of site ☒Poorly drained **56**% of site
   b. If any agricultural land is involved, how many acres of soil are classified within soil group 1 through 4 of the NYS Land Classification System? **7,800** acres. (See 1 NYCRR 370)
4. Are there bedrock outcroppings on project site? ☐Yes ☒No
   a. What is the depth to bedrock? **N/A** (in feet)
5. Approximate percentage of proposed project site with slopes: ☒0-10% **75**% ☒10-15 % **16**% ☒15% or greater **9**%
6. Is project substantially contiguous to, or contain a building, site, or district, listed on the State or National Registers of Historic Places? ☐Yes ☒No **New York SHPO GIS Database**
7. Is project substantially contiguous to a site listed on the Register of National Natural Landmarks? ☐Yes ☒No
8. What is the depth of the water table? **Variable; at the surface to 137 feet** (in feet)
9. Is site located over a primary, principal, or sole source aquifer? ☐Yes ☒No
10. Do hunting, fishing, or shell fishing opportunities presently exist in the project area? ☒Yes ☐No **Hunting and fishing.**
11. Does project site contain any species of plant or animal life that is identified as threatened or endangered?
    ☒Yes ☐No According to **NYSDEC, the Henslow's sparrow, short-eared owl, sedge wren, and bald eagle are known to occur within 10 miles of the project area. According to USFWS, the clubshell (endangered) and rayed bean (candidate) are known to occur in Chautauqua County. See Attachment A for correspondence.**
    Identify each species
12. Are there any unique or unusual land forms on the project site? (i.e., cliffs, dunes, other geological formations)
    ☐Yes ☒No Describe
13. Is the project site presently used by the community or neighborhood as an open space or recreation area?
    ☐Yes ☒No If yes, explain
14. Does the present site include scenic views known to be important to the community? ☐Yes ☒No
    **A Visual Impact Assessment will be conducted as part of the DEIS.**
15. Streams within or contiguous to project area: **Unnamed tributaries to Tupper Creek; Unnamed tributaries to North Branch Conewango Creek; and Unnamed tributaries to West Branch Conewango Creek.**
    a. Name of Stream and name of River to which it is tributary **North and West Branches to Conewango Creek drain to Conewango Creek, which drains to the Allegheny River in Pennsylvania; Tupper Creek drains to Walnut Creek, which drains to Lake Erie.**
16. Lakes, ponds, wetland areas within or contiguous to project area:
    a. Name **The Project Area contains 6 NYSDEC mapped wetlands and 86 NWI Mapped wetlands**
    b. Size (in acres) **NYSDEC mapped wetlands: 238.32 acres. NWI Mapped wetlands: 210.58 acres. Wetland acreage to be further delineated in the wetland application that will be submitted to NYSDEC and USACE.**

17. Is the site served by existing public utilities? ☒Yes ☐No
    a) If Yes, does sufficient capacity exist to allow connection? ☒Yes ☐No
    b) If Yes, will improvements be necessary to allow connection? ☒Yes ☐No
18. Is the site located in an agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? ☒Yes ☐No **Districts 0, 5, and 10**
19. Is the site located in or substantially contiguous to a Critical Environmental Area designated pursuant to Article 8 of the ECL, and 6 NYCRR 617? ☐Yes ☒No
20. Has the site ever been used for the disposal of solid or hazardous wastes? ☐Yes ☒No

## B. Project Description

1. Physical dimensions and scale of project (fill in dimensions as appropriate)
    a. Total contiguous acreage owned or controlled by project sponsor **Approx. 13,101** acres.
    b. Project acreage to be developed **Approximately 323 acres** acres initially; **Approx. 300** acres ultimately.
    c. Project acreage to remain undeveloped **12,778** acres.
    d. Length of project, in miles **N/A** (If appropriate)
    e. If the project is an expansion, indicate percentage of expansion proposed **N/A**%
    f. Number of off-street parking spaces existing **None**; proposed **None.**
    g. Maximum vehicular trips generated per hour **15 (construction)** (upon completion of project)? **None**
    h. If residential: Number and type of housing units: **N/A**

| | One Family | Two Family | Multiple Family | Condominium |
|---|---|---|---|---|
| Initially | **N/A** | **N/A** | **N/A** | **N/A** |
| Ultimately | **N/A** | **N/A** | **N/A** | **N/A** |

    i. Dimensions (in feet) of largest proposed structure **120 meters (393 ft)** height; **77.2 meters (253)** width, **N/A**length
    j. Linear feet of frontage along a public thoroughfare project will occupy is? **Approx. 11,282** ft.
2. How much natural material (i.e., rock, earth, etc.) will be removed from the site? **Approximately 140,000 CY** tons/cubic yards **40% of material will likely be topsoil that will be distributed on the associated access roads/turbine site. The remaining 60% will either be used in construction of the access roads throughout the project or sent to controlled local landfills.**
3. Will disturbed areas be reclaimed? ☒Yes ☐No ☐N/A
    a. If yes, for what intended purpose is the site being reclaimed? **Agriculture; wetlands.**
    b. Will topsoil be stockpiled for reclamation? ☒Yes ☐No
    c. Will upper subsoil be stockpiled for reclamation? ☒Yes ☐No
4. How many acres of vegetation (trees, shrubs, ground covers) will be removed from site? **Approx. 126** acres.
5. Will any mature forest (over 100 years old) or other locally-important vegetation be removed by this project? ☐Yes ☒No
6. If single phase project: Anticipated period of construction **12** months, (including demolition).
7. If multi-phased: **NA**
    a. Total number of phases anticipated **N/A** (number),
    b. Anticipated date of commencement phase 1 **N/A** month **N/A** year, (including demolition).
    c. Approximate complete date of final phase **N/A** month **N/A** year.
    d. Is phase 1 functionally dependent on subsequent phases? ☐Yes ☒No
8. Will blasting occur during construction? ☐Yes ☒No
9. Number of jobs generated during construction **Approximately 185**; after project is complete **Approximately 7**. **1 Plant Manager, 1 Administrative, 5 Technical.**
10. Number of jobs eliminated by this project **None**.
11. Will project require relocation of any projects or facilities? ☐Yes ☒No If yes, explain
12. Is surface liquid waste disposal involved? ☐Yes ☒No
    a. If yes, indicate type of waste (sewage, industrial, etc.) and amount **N/A**
    b. Name of water body into which effluent will be discharged **N/A**
13. Is subsurface liquid waste disposal involved? ☐Yes ☒No Type
14. Will surface area of an existing water body increase or decrease by proposal? ☐Yes ☒No Explain
15. Is project or any portion of project located in a 100 year flood plain? ☒Yes ☐No
16. Will the project generate solid waste? ☒Yes ☐No
    a. If yes, what is the amount per month **approximately 10** tons **during 6 months of construction. Waste generation will be negligible during operations.**
    b. If yes, will an existing waste facility be used? ☒Yes ☐No
    c. If yes, give name **TBD. Due to materials identification and classification, multiple sites may be used.**

d. Will any wastes not go into a sewage disposal system or into a sanitary landfill? ☐Yes ☒No
e. If yes, explain **N/A**

17. Will the project involve the disposal of solid waste? ☐Yes ☒No
    a. If yes, what is the anticipated rate of disposal? **N/A** tons/month.
    b. If yes, what is the anticipated site life: **N/A** years.
18. Will project use herbicides or pesticides: ☐Yes ☒No
19. Will project routinely produce odors (more than one hour per day)? ☐Yes ☒No
20. Will project produce operating noise exceeding the local ambient noise levels? ☒Yes ☐No **Noise analysis will be conducted in the DEIS.**
21. Will project result in an increase in energy use? ☐Yes ☒No
    If yes, indicate type(s)
22. If water supply is from wells, indicate pumping capacity **N/A** gallons/minute. **N/A**
23. Total anticipated water usage per day **N/A** gallons/minute. N/A
24. Does project involve Local, State or Federal funding? ☐Yes ☒No
    If yes, explain
25. **Approvals Required:**

| | | | Type | Submittal Date |
|---|---|---|---|---|
| City, Town, Village Board | ☒Yes | ☐No | **See Attachment B** | |
| City, Town, Village Planning Board | ☒Yes | ☐No | | |
| City, Town Zoning Board | ☒Yes | ☐No | | |
| City, County Health Department | ☒Yes | ☐No | | |
| Other Local Agencies | ☐Yes | ☒No | | |
| Other Regional Agencies | ☐Yes | ☒No | | |
| State Agencies | ☒Yes | ☐No | | |
| Federal Agencies | ☒Yes | ☐No | | |

## C. Zoning and Planning Information

1. Does proposed action involve a planning or zoning decision? ☒Yes ☐No
   If yes, indicate decision required:
   ☒zoning amendment ☐zoning variance ☒special use permit ☐subdivision ☒site plan
   ☐new/revision of master plan ☐resource management plan ☒other **Wind Energy Permit**
2. What is the zoning classification(s) of the site? **Portions of the Project Area in Villenova are classified as Transition (T) District. In Hanover, site is located in A-1 (Agricultural and Residential).**
3. What is the maximum potential development of the site if developed as permitted by the present zoning? **N/A**
4. What is the proposed zoning of the site? **Wind Overlay District**
5. What is the maximum potential development of the site if developed as permitted by the proposed zoning? **N/A**
6. Is the proposed action consistent with the recommended uses in adopted local land use plans? ☒Yes ☐No **Project will allow continued use of land for agricultural purposes. The town of Villenova has adopted a Wind Energy Facilities Law that regulates the placement of Wind Energy Conversion Devices/Farms. The Town of Hanover is considering a Wind Energy Facilities Law that fits within the framework of its existing zoning law. The action is consistent with the requirements set forth in these laws.**
7. What are the predominant land use(s) and zoning classifications within a ¼ mile radius of proposed action? **Agriculture and forested.**
8. Is the proposed action compatible with adjoining/surrounding land uses within a ¼ mile: ☒ Yes ☐No **See item 6.**
9. If the proposed action is the subdivision of land, how many lots are proposed? **N/A**
   a. What is the minimum lot size proposed? **N/A**
10. Will proposed action require and authorization(s) for the formation of sewer or water districts? ☐Yes ☒No
11. Will the proposed action create a demand for any community provided services (recreation, education, police, fire protection)? ☒Yes ☐No **Small potential increase in demand for police and fire protection.**
    a. If yes, is existing capacity sufficient to handle projected demand? ☒Yes ☐No
12. Will the proposed action result in the generation of traffic significantly above present levels? ☒Yes ☐No **Temporarily during construction. During operation traffic will resume to present levels. Traffic analysis will be conducted as part of the DEIS.**
    a. If yes, is the existing road network adequate to handle the additional traffic? ☒Yes ☐No

## D. Informational Details

Attach any additional information as may be needed to clarify your project. If there are or may be any adverse impacts associated with your proposal, please discuss such impacts and the measures which you propose to mitigate or avoid them.

## E. Verification

I certify that the information provided above is true to the best of my knowledge.

Applicant/Sponsor Name

Date May 16th 2008

Signature _____ JOHN M DOHERTY Title E.V.P. DEVELOPMENT

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment.

# PART 2 – PROJECT IMPACTS AND THEIR MAGNITUDE

### Responsibility of Lead Agency

**General Information** (Read Carefully)

- In completing the form the reviewer should be guided by the question: Have my responses and determinations been **reasonable?** The reviewer is not expected to be an expert environmental analyst.
- The **Examples** provided are to assist the reviewer by showing types of impacts and wherever possible the threshold of magnitude that would trigger a response in column 2. The examples are generally applicable throughout the State and for most situations. But, for any specific project or site other examples and/or lower thresholds may be appropriate for a Potential Large Impact response, thus requiring evaluation in Part 3.
- The impacts of each project, on each site, in each locality, will vary. Therefore, the examples are illustrative and have been offered as guidance. They do not constitute an exhaustive list of impacts and thresholds to answer each question.
- The number of examples per question does not indicate the importance of each question.
- In identifying impacts, consider long term, short term and cumulative effects.

**Instructions** (Read carefully)

a. Answer each of the 20 questions in PART 2. Answer **Yes** if there will be **any** impact.
b. **Maybe** answers should be considered as **Yes** answers.
c. If answering **No** to a question then check the appropriate box (column 1 or 2) to indicate the potential size of the impact. If impact threshold equals or exceeds any example provided, check column 2. If impact will occur but threshold is lower than example, check column 1.
d. Identifying that an impact will be potentially large (column 2) does not mean that it is also necessarily **significant**. Any large impact must be evaluated in PART 3 to determine significance. Identifying an impact in column 2 simply asks that it be looked at further.
e. If reviewer has doubt about size of the impact then consider the impact as potentially large and proceed to PART 3.
f. If a potentially large impact checked in column 2 can be mitigated by change(s) in the project to a small to moderate impact, also check the **Yes** box in column 3. A **No** response indicates that such a reduction is not possible. This must be explained in Part 3.

| | 1 Small to Moderate Impact | 2 Potential Large Impact | 3 Can Impact Be Mitigated By Project Change | |
|---|---|---|---|---|
| **IMPACT ON LAND** | | | | |
| 1. Will the proposed action result in a physical change to the project site? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Any construction on slopes of 15% or greater, (15 foot rise per 100 foot of length), or where the general slopes in the project area exceed 10%. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction on land where the depth to the water table is less than 3 feet. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction of paved parking area for 1,000 or more vehicles. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction on land where bedrock is exposed or generally within 3 feet of existing ground surface. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction that will continue for more than 1 year or involve more than one phase or stage. | ☐ | ☐ | ☐Yes | ☐No |
| • Excavation for mining purposes that would remove more than 1,000 tons of natural material (i.e., rock or soil) per year. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction or expansion of a sanitary landfill. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction in a designated floodway. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts | ☐ | ☐ | ☐Yes | ☐No |
| 2. Will there be an effect to any unique or unusual land forms found on the site? (i.e., cliffs, dunes, geological formations, etc) ☐NO ☐YES | | | | |
| • Specific land forms: | ☐ | ☐ | ☐Yes | ☐No |

| | 1 Small to Moderate Impact | 2 Potential Large Impact | 3 Can Impact Be Mitigated By Project Change | |
|---|---|---|---|---|
| **IMPACT ON WATER** | | | | |
| 3. Will proposed action affect any water body designated as protected? (Under Articles 15, 24, 25 of the Environmental Conservation Law, ECL) | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Developable area of site contains a protected water body. | ☐ | ☐ | ☐Yes | ☐No |
| • Dredging more than 100 cubic yards of material from channel of a protected stream. | ☐ | ☐ | ☐Yes | ☐No |
| • Extension of utility distribution facilities through a protected water body. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction in a designated freshwater or tidal wetland. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| 4. Will proposed action affect any non-protected existing or new body of water? | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • A 10% increase or decrease in the surface area of any body of water or more than a 10 acre increase or decrease. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction of a body or water that exceeds 10 acres of surface area. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| 5. Will Proposed Action affect surface or groundwater quality or quantity? | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action will Require a discharge permit. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action requires use of a source of water that does not have approval to serve proposed (project) action. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action requires water supply from wells with greater than 45 gallons per minute pumping capacity. | ☐ | ☐ | ☐Yes | ☐No |
| • Construction or operation causing any contamination of a water supply system. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will adversely affect groundwater. | ☐ | ☐ | ☐Yes | ☐No |
| • Liquid effluent will be conveyed off the site to facilities which presently do not exist or have inadequate capacity. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action would use water in excess of 20,000 gallons per day. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will likely cause siltation or other discharge into an existing body of water to the extent that there will be an obvious visual contrast to natural conditions. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will require the storage of petroleum or chemical products greater than 1,100 gallons. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will allow residential uses in areas without water and/or sewer services. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action locates commercial and/or industrial uses which may require new or expansion of existing waste treatment and/or storage facilities. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |

| | 1 Small to Moderate Impact | 2 Potential Large Impact | 3 Can Impact Be Mitigated By Project Change | |
|---|---|---|---|---|
| 6. Will proposed action alter drainage flow or patterns, or surface water runoff? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action would change flood water flows. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action may cause substantial erosion. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action is incompatible with existing drainage patterns. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will allow development in a designated floodway. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON AIR** | | | | |
| 7. Will proposed action affect air quality? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action will induce 1,000 or more vehicle trips in any given hour. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will result in the incineration of more than 1 tone of refuse per hour. | ☐ | ☐ | ☐Yes | ☐No |
| • Emission rate of total contaminants will exceed 5 lbs. per hour or a heat source producing more than 10 million BTU's per hour. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed action will allow an increase in the amount of land committed to industrial use. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed action will allow an increase in the density of industrial development within existing industrial areas. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON PLANTS AND ANIMALS** | | | | |
| 8. Will Proposed Action affect any threatened or endangered species? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Reduction of one or more species listed on the New York or Federal list, using the site, over or near site or found on the site. | ☐ | ☐ | ☐Yes | ☐No |
| • Removal of any portion of a critical or significant wildlife habitat. | ☐ | ☐ | ☐Yes | ☐No |
| • Application of pesticide or herbicide more than twice a year, other than for agricultural purposes. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| 9. Will Proposed Action substantially affect non-threatened or non-endangered species? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action would substantially interfere with any resident or migratory fish, shellfish or wildlife species. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action requires the removal of more than 10 acres of mature forest (over 100 years of age) or other locally important vegetation. | ☐ | ☐ | ☐Yes | ☐No |

| | 1 Small to Moderate Impact | 2 Potential Large Impact | 3 Can Impact Be Mitigated By Project Change | |
|---|---|---|---|---|
| **IMPACT ON AGRICULTURAL LAND RESOURCES** | | | | |
| 10. Will the Proposed Action affect agricultural land resources? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • The proposed action would sever, cross or limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc.) | ☐ | ☐ | ☐Yes | ☐No |
| • Construction activity would excavate or compact the soil profile of agricultural land. | ☐ | ☐ | ☐Yes | ☐No |
| • The proposed action would irreversibly convert more than 10 acres of agricultural land or, if located in an Agricultural District, more than 2.5 acres of agricultural land. **I** | ☐ | ☐ | ☐Yes | ☐No |
| • The proposed action would disrupt or prevent installation of agricultural land management systems (e.g., subsurface drain lines, outlet ditches, strip cropping); or create a need for such measures (e.g., cause a farm field to drain poorly due to increased runoff) | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON AESTHETIC RESOURCES** | | | | |
| 11. Will proposed action affect aesthetic resources? ☐NO ☒YES (If necessary, use the Visual EAF Addendum in Section 617.20, Appendix B.) | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed land uses, or project components obviously different from or in sharp contrast to current surrounding land use patterns, whether man-made or natural. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed land uses, or project components visible to users of aesthetic resources which will eliminate or significantly reduce their enjoyment of the aesthetic qualities of that resource. | ☐ | ☐ | ☐Yes | ☐No |
| • Project components that will result in the elimination or significant screening of scenic views known to be important to the area. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON HISTORIC AND ARCHAEOLOGICAL RESOURCES** | | | | |
| 12. Will Proposed Action impact any site or structure of historic, prehistoric or paleontological importance? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action occurring wholly or partially within or substantially contiguous to any facility or site listed on the State or National Register of historic places. | ☐ | ☐ | ☐Yes | ☐No |
| • Any impact to an archaeological site or fossil bed located within the project site. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will occur in an area designated as sensitive for archaeological sites on the NYS Site Inventory. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | | | | |

| | 1 Small to Moderate Impact | 2 Potential Large Impact | 3 Can Impact Be Mitigated By Project Change | |
|---|---|---|---|---|
| **IMPACT ON OPEN SPACE AND RECREATION** | | | | |
| 13. Will Proposed Action affect the quantity or quality of existing or future open spaces or recreational opportunities? | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • The permanent foreclosure of a future recreational opportunity. | ☐ | ☐ | ☐Yes | ☐No |
| • A major reduction of an open space important to the community. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON CRITICAL ENVIRONMENTAL AREAS** | | | | |
| 14. Will Proposed Action impact the exceptional or unique characteristics of a critical environmental area (CEA) established pursuant to subdivision 6 NYCRR 617.14(g)? | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action to locate within the CEA? | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will result in a reduction in the quantity of the resource? | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will result in a reduction of the quality of the resource? | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will impact the use, function or enjoyment of the resource? | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON TRANSPORTATION** | | | | |
| 15. Will there be an effect to existing transportation systems? | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Alteration of present patterns of movement of people and/or goods. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will result in major traffic problems. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON ENERGY** | | | | |
| 16. Will proposed action affect the community's sources of fuel or energy supply? | | | | |
| ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action will cause a greater than 5% increase in the use of any form of energy in the municipality. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two family residences or to sere a major commercial or industrial use. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |

| | 1 Small to Moderate Impact | 2 Potential Large Impact | 3 Can Impact Be Mitigated By Project Change | |
|---|---|---|---|---|
| **NOISE AND ODOR IMPACTS** | | | | |
| 17. Will there be objectionable odors, noise, or vibration as a result of the Proposed Action? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Blasting within 1,500 feet of a hospital, school or other sensitive facility. | ☐ | ☐ | ☐Yes | ☐No |
| • Odors will occur routinely (more than one hour per day). | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will produce operating noise exceeding the local ambient noise levels for noise outside of structures. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will remove natural barriers that would act as a noise screen. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON PUBLIC HEALTH** | | | | |
| 18. Will Proposed Action affect public health and safety? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • Proposed Action may cause a risk of explosion or release of hazardous substances (i.e., oil, pesticides, chemicals, radiation, etc.) in the event of accident or upset conditions, or there may be a chronic low level discharge or emission. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action may result in the burial of "hazardous wastes" in any form (i.e., toxic, poisonous, highly reactive, radioactive, irritating, infectious, etc.) | ☐ | ☐ | ☐Yes | ☐No |
| • Storage facilities for one million or more gallons of liquefied natural gas or other flammable liquids. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed action may result in the excavation or other disturbance within 2,000 feet of a site used for the disposal of solid or hazardous waste. | ☐ | ☐ | ☐Yes | ☐No |
| • Other impacts: | ☐ | ☐ | ☐Yes | ☐No |
| **IMPACT ON GROWTH AND CHARACTER OF COMMUNITY OR NEIGHBORHOOD** | | | | |
| 19. Will proposed action affect the character of the existing community? ☐NO ☐YES | | | | |
| **Examples** that would apply to column 2 | | | | |
| • The permanent population of the city, town or village in which the project is located is likely to grow by more than 5%. | ☐ | ☐ | ☐Yes | ☐No |
| • The municipal budget for capital expenditures or operating services will increase by more than 5% per year as a result of this project. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed action will conflict with officially adopted plans or goals. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed action will cause a change in the density of land use. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed action will replace or eliminate existing facilities, structures or areas of historic importance to the community. | ☐ | ☐ | ☐Yes | ☐No |
| • Development will create a demand for additional community services (e.g., schools, police and fire, etc.) | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will set an important precedent for future projects. | ☐ | ☐ | ☐Yes | ☐No |
| • Proposed Action will create or eliminate employment. | ☐ | ☐ | ☐Yes | ☐No |

| 1<br>Small to Moderate Impact | 2<br>Potential Large Impact | 3<br>Can Impact Be Mitigated By Project Change | |
|---|---|---|---|
| ☐ | ☐ | ☐Yes | ☐No |

- Other impacts:

20. Is there, or is there likely to be, public controversy related to potential adverse environmental impacts?

☐NO ☐YES

**If any action in Part 2 is identified as a potential large impact or if you cannot determine the magnitude of impact, proceed to Part 3.**

# PART 3 – EVALUATION OF THE IMPORTANCE OF IMPACTS

## Responsibility of Lead Agency

**Part 3 must be prepared if one or more impact(s) is considered to be potentially large, even if the impact(s) may be mitigated.**

**Instructions**
Discuss the following for each impact identified in Column 2 of Part 2:

1. Briefly describe the impact.

2. Describe (if applicable) how the impact could be mitigated or reduced to a small to moderate impact by project change(s).

3. Base on the information available, decide if it is reasonable to conclude that this impact is **important.**

   To answer the question of importance, consider:
   - The probability of the impact occurring
   - The duration of the impact
   - Its irreversibility, including permanently lost resources of value
   - Whether the impact can or will be controlled
   - The regional consequence of the impact
   - Its potential divergence from local needs and goals
   - Whether known objections to the project relate to this impact.

(Continue on attachments)

# Attachment A

# Ball Hill Windpark
# United States Fish and Wildlife Service Correspondence
# New York Natural Heritage Program Correspondence
# (Part 1A-11)

**ecology and environment, inc.**
International Specialists in the Environment
BUFFALO CORPORATE CENTER
368 Pleasant View Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

September 18, 2006

Ms. Jean Pietrusiak
Information Services; New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, New York 12233-4757

Re: Noble Environmental Power LLC
Towns of Villenova and Hanover
Chautauqua County, NY

Dear Ms. Pietrusiak:

Ecology & Environment, Inc. (E & E), on behalf of Noble Environmental Power LLC (Noble), is preparing a feasibility study for a potential wind energy facility in the Towns of Villenova and Hanover, Chautauqua County, NY. Prior analyses of meteorological conditions in the vicinity of this area have identified the presence of a favorable wind resource. The project, if implemented, would create a renewable energy supply, with the electricity generated from the facility to be supplied to the regional electric supply grid. This project would be specifically designed to meet the needs of the Governor's initiative to increase the percentage of New York State's electric supply from renewable sources to 25% by 2013.

The proposed Ball Hill project area is shown in the enclosed figure. The figure is a composite of the Cherry Creek (1990), Forestville (1990), Perrysburg (1990), and Hamlet (1990) 7.5 minute USGS topographic quadrangle maps.

We are currently analyzing the potential issues involved with the siting of a wind energy facility in the identified area; therefore, no specific layout of facilities or infrastructure is available. Rather, based our preliminary evaluation of existing resources, Noble would design the facility to minimize impacts to the extent possible. E & E is seeking your assistance in identifying state-listed threatened or endangered species, significant or critical habitats, natural areas, or other wildlife or fisheries features that may occur within the identified project area boundary.

If you have any questions regarding this data request or require additional project information, please do not hesitate to call me at 716-684-8060. Thank you very much for your attention to this request. We look forward to receiving your input on this project.

Sincerely,
ECOLOGY & ENVIRONMENT, INC.

Christine Sousa
Biologist

Enc.: (1)

cc: Sandy Sayyeau (Noble)
Christina Presnell (Noble)
Mike Morgante (E & E)

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\\BUFSDL4\GIS\Buffalo\Noble Wind\2008 NOBLE SITES\Maps\Villenova\MXDs\Avian Study\Villenova_24K_topo.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Ball Hill Project Area**
**USGS1:24,000 Quadrangle**

0 0.5 1 2
Miles

**New York State Department of Environmental Conservation**
**Division of Fish, Wildlife & Marine Resources**
**New York Natural Heritage Program**
625 Broadway, 5th floor, Albany, New York 12233-4757
**Phone:** (518) 402-8935 • **FAX:** (518) 402-8925
**Website:** www.dec.state.ny.

Denise M. Sheehan
Commissioner

October 17, 2006

Christine Sousa
Ecology and Environment, Inc
Buffalo Corporate Ctr, 368 Pleasant View Dr.
Lancaster, NY 14086

Dear. Ms. Sousa:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed Noble Environmental Power Wind Energy Facility, area as indicated on the map you provided, located in the Towns of Villenova and Hanover, Chautauqua County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

PLEASE NOTE: For Windpower Projects, we report all records found within the project boundary, and any avian records that may be located within a 10-mile buffer of the project boundary. We also report Indiana bat hibernaculum that may be located within a 40-mile buffer of the project boundary.

The presence of rare species may result in this project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Seoane

Tara Seoane, Information Services
NY Natural Heritage Program

Enc.

cc: Reg. 9, Wildlife Mgr
Jack Nasca, Environmental Permits, Albany
Mark Wothal, Bureau of Habitat, Albany

# Natural Heritage Report on Rare Species and Ecological Communities

**These occurrences are within 10-miles of the project site.**

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor, Albany, NY
12233-4757
(518) 402-8935

~This report contains **SENSITIVE** information that may not be released to the public without permission from the NY Natural Heritage Program.
~Refer to the User's Guide for explanations of codes, ranks and fields.
~Location maps for certain species and communities may not be provided if 1) the species is vulnerable to disturbance, 2) the location and/or extent is not precisely known, and/or 3) the location and/or extent is too large to display.

Natural Heritage Report on Rare Species and Ecological Communities

## BIRDS

### *Ammodramus henslowii*

**Henslow's Sparrow**

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Threatened | **NYS Rank:** | S3B; Vulnerable | Office Use 11071 |
| **Federal Listing:** | | **Global Rank:** | G4; Apparently secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |
| **County:** | Chautauqua | | | |
| **Town:** | Arkwright | | | |
| **Location:** | Brainard Road Fields | | | |
| **Directions:** | From Cowdens Corner, follow Skinner Miller Road south to Brainard Road. Turn west on Brainard Road. The birds were found in fields on the south side of the road. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

### *Ardea herodias*

**Great Blue Heron**

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Protected | **NYS Rank:** | S5; Demonstrably secure | Office Use 4800 |
| **Federal Listing:** | | **Global Rank:** | G5; Demonstrably secure | SL |
| **Last Report:** | 1995-04-03 | **EO Rank:** | Good or Fair | |
| **County:** | Chautauqua | | | |
| **Town:** | Arkwright | | | |
| **Location:** | Dibble Hill, Farrington Hollow | | | |
| **Directions:** | The rookery is located about 0.8 mi northwest of Town Corners and 2000 feet northwest of the junction of Farrington Hollow Road and Hamlet Road. | | | |
| **General Quality and Habitat:** | Usually more than 50 nests/year, but some years less. Ridgetop with mature northern hardwoods-beech, maple, hemlock. Nests mostly in beech trees. | | | |

### *Asio flammeus*

**Short-eared Owl**

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Endangered | **NYS Rank:** | S2; Imperiled | Office Use 11085 |
| **Federal Listing:** | | **Global Rank:** | G5; Demonstrably secure | |
| **Last Report:** | ** | **EO Rank:** | ** | ESU |
| **County:** | Chautauqua | | | |
| **Town:** | Sheridan | | | |
| **Location:** | Dunkirk Airport Sheridan | | | |
| **Directions:** | The birds were observed in the fields bounded by Middle Road to the south, Newell Road to the east, Harrington Road to the west, and a railroad to the north, in the town of Sheridan. | | | |
| **General Quality and Habitat:** | **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

*Cistothorus platensis*

**Sedge Wren**

Office Use 10681

**NY Legal Status:** Threatened
**NYS Rank:** S3B; Vulnerable
**Federal Listing:**
**Global Rank:** G5; Demonstrably secure
**Last Report:** **
**EO Rank:** **
ESU

**County:** Chautauqua
**Town:** Sheridan
**Location:** Middle Road Field Sheridan
**Directions:** From Sheridan, follow Center Road north to Route 121 (Middle Road). Turn west on Route 121 (Middle Road). Look for a stone driveway on the north side of the road (mailbox #2897). The birds were observed in the field in front of the willow plantation.
**General Quality and Habitat:** **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859.

---

*Cistothorus platensis*

**Sedge Wren**

Office Use 10686

**NY Legal Status:** Threatened
**NYS Rank:** S3B; Vulnerable
**Federal Listing:**
**Global Rank:** G5; Demonstrably secure
**Last Report:** **
**EO Rank:** **
ESU

**County:** Chautauqua
**Town:** Pomfret
**Location:** Sage Road Field Nortons Switch
**Directions:** From Fredonia, follow Route 20 west to Adams Road. Turn south on Adams Road and follow it to Webster Road. Turn west on Webster Road then turn south on Sage Road. The birds were seen and heard on both sides of the road.
**General Quality and Habitat:** **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859.

---

*Haliaeetus leucocephalus*

**Bald Eagle**

Office Use 9672

**NY Legal Status:** Threatened
**NYS Rank:** S2S3B,S2N; Imperiled
**Federal Listing:** Threatened
**Global Rank:** G5; Demonstrably secure
**Last Report:** **
**EO Rank:** **
ESU

**County:** Cattaraugus, Chautauqua
**Town:** Cattaraugus Indian Reservation, Cattaraugus Indian Reservation
**Location:** Cattaraugus Creek Indian Reservation
**Directions:** There are five nests on the south side of Cattaraugus Creek about 5 kilometers upstream (east) of the New York State Thruway crossing. The location of Nest D has not been GPSed, but it is right next to Nest E. Access is only through the Reservation of Seneca Nation.
**General Quality and Habitat:** **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859.

---

*Haliaeetus leucocephalus*

**Bald Eagle**

Office Use 11638

**NY Legal Status:** Threatened
**NYS Rank:** S2S3B,S2N; Imperiled
**Federal Listing:** Threatened
**Global Rank:** G5; Demonstrably secure
**Last Report:** **
**EO Rank:** **
ESU

**County:** Cattaraugus
**Town:** Dayton
**Location:** Conewango Swamp
**Directions:** The bald eagles are nesting east of Dexter Corners and west of Wolf Road. One nest is in Conewango Swamp and the other is just southwest near a tributary associated with the swamp.
**General Quality and Habitat:** **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859.

---

Records Processed

**These occurrences are within the project site or in close proximity.**

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor, Albany, NY
12233-4757
(518) 402-8935

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~Location maps for certain species and communities may not be provided if 1) the species is vulnerable to disturbance, 2) the location and/or extent is not precisely known, and/or 3) the location and/or extent is too large to display.

Natural Heritage Report on Rare Species and Ecological Communities

## COMMUNITIES

### Rich hemlock-hardwood peat swamp

This occurrence of Rich Hemlock-Hardwood Peat Swamp is considered significant from a statewide perspective by the NY Natural Heritage Program. It is either an occurrence of a community type that is rare in the state or a high quality example of a more common community type. By meeting specific, documented significance criteria, the NY Natural Heritage Program considers this occurrence to have high ecological and conservation value. Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Unlisted | **NYS Rank:** | S2S3; | 961 |
| **Federal Listing:** | | **Global Rank:** | G3G4; | SL |
| **Last Report:** | 1992-08-28 | **EO Rank:** | | |
| **County:** | Chautauqua | | | |
| **Town:** | Arkwright, Villenova | | | |
| **Location:** | West Mud Lake Swamp | | | |
| **Directions:** | From Black Corners (junction of Route 83 and Farrington Hollow Road), go east on Route 83 about 1.0 mi to West Mud Lake (easily seen to the north of Route 83). The swamp is along the west edge of West Mud Lake. The swamp continues south of Route 83 along the west side of West Branch Conewango Creek. | | | |
| **General Quality and Habitat:** | Excellent quality, with history of some selective logging followed by very good recovery. Community is well-buffered. Minimal disturbance and good size. A mixed conifer and hardwood swamp along the west side of west Mud Lake, a eutrophic pond. The wetland continues to the south of Route 83. To the north and west of wetland are agricultural fields. The swamp extends south of Route 83 west of West Branch Conewango Creek. The southern portion of the swamp is more disturbed by selective logging than the north end (west of the lake). The north end is pristine. | | | |

### Shrub swamp

This occurrence of Shrub Swamp is considered significant from a statewide perspective by the NY Natural Heritage Program. It is either an occurrence of a community type that is rare in the state or a high quality example of a more common community type. By meeting specific, documented significance criteria, the NY Natural Heritage Program considers this occurrence to have high ecological and conservation value. Office Use

| | | | | |
|---|---|---|---|---|
| **NY Legal Status:** | Unlisted | **NYS Rank:** | S5; | 3633 |
| **Federal Listing:** | | **Global Rank:** | G5; | |
| **Last Report:** | 1990-08-15 | **EO Rank:** | | |
| **County:** | Chautauqua | | | |
| **Town:** | Hanover, Villenova | | | |
| **Location:** | East Mud Lake | | | |
| **Directions:** | From the junction of Route 93 and Route 39 in Parcells Corners, travel south on Route 93 (Hanover Road) 1.75 miles. Mud Lake and the swamp are on the right (west) side of the road. Ask permission for access to the site. | | | |
| **General Quality and Habitat:** | Of good size and biologically diverse, with some cottages on the lake shore. Uplands around the wetlands are primarily farm fields. There were no exotics observed. A lake and small pond surrounded by a very dense shrub swamp thicket. Further upland, the shrub swamp gradually transitions into a red maple swamp which eventually merges with a hemlock-northern hardwood forest. East Mud Lake is bordered on the west side by homes and cottages. Much of the surrounding landscape is farm fields. | | | |

## SH

*Ichthyomyzon greeleyi*

**Mountain Brook Lamprey**

Office Use 11520

**NY Legal Status:** Special Concern
**NYS Rank:** S1; Critically imperiled
**Federal Listing:**
**Global Rank:** G3G4; Vulnerable
**Last Report:** 2001-05-04
**EO Rank:** Extant
**County:** Chautauqua
**Town:** Villenova
**Location:** West Branch Conewango Creek
**Directions:** The lampreys were found in West Branch Conewango Creek at Route 322.
**General Quality and Habitat:** The lampreys were found in a creek.

3 Records Processed

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**ecology and environment, inc.**
International Specialists in the Environment
BUFFALO CORPORATE CENTER
368 Pleasant View Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

September 18, 2006

Mr. David Stilwell
United States Fish and Wildlife Service
3817 Luker Road
Cortland, New York 13045

Re: Noble Environmental Power LLC
Towns of Villenova and Hanover
Chautauqua County, NY

Dear Mr. Stilwell:

Ecology & Environment, Inc. (E & E), on behalf of Noble Environmental Power LLC (Noble), is preparing a feasibility study for a potential wind energy facility in the Towns of Villenova and Hanover, Chautauqua County, NY. Prior analyses of meteorological conditions in the vicinity of this area have identified the presence of a favorable wind resource. The project, if implemented, would create a renewable energy supply, with the electricity generated from the facility to be supplied to the regional electric supply grid. This project would be specifically designed to meet the needs of the Governor's initiative to increase the percentage of New York State's electric supply from renewable sources to 25% by 2013.

The proposed Ball Hill project area is shown in the enclosed figure. The figure is a composite of the Cherry Creek (1990), Forestville (1990), Perrysburg (1990), and Hamlet (1990) 7.5 minute USGS topographic quadrangle maps.

We are currently analyzing the potential issues involved with the siting of a wind energy facility in the identified area; therefore, no specific layout of facilities or infrastructure is available. Rather, based our preliminary evaluation of existing resources, Noble would design the facility to minimize impacts to the extent possible. E & E is seeking your assistance in identifying federally-listed threatened or endangered species, significant or critical habitats, natural areas, or other wildlife or fisheries features that may occur within the identified project area boundary.

A preliminary analysis of available wetland and hydric soils mapping has been completed for the project area. Based on our review, we realize that several state and federal jurisdictional wetlands likely occur within the project area. Field delineations and evaluations of these areas will be necessary and would be conducted in later stages of facility siting, assuming that the site is ultimately considered feasible for siting a wind farm.

If you have any questions regarding this data request, or require additional project information, please do not hesitate to call me at 716-684-8060. Thank you very much for your attention to this request. We look forward to receiving your input on this project.

Sincerely,
ECOLOGY & ENVIRONMENT, INC.

Christine Sousa
Biologist

Enc.: (1)

cc: Sandy Sayyeau (Noble)
Christina Presnell (Noble)
Mike Morgante (E & E)

© Ecology & Environment, Inc. GIS Department Project #00227.NP20.02.02
\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\Avian_Study\Villenova_24K_topo.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Ball Hill Project Area**
**USGS1:24,000 Quadrangle**

0 0.5 1 2
Miles

# Chautauqua County

## Federally Listed Endangered and Threatened Species and Candidate Species

This list represents the best available information regarding known or likely County occurrences of Federally-listed and candidate species and is subject to change as new information becomes available.

| Common Name | Scientific Name | Status |
|---|---|---|
| Bald eagle[1] | *Haliaeetus leucocephalus* | D |
| Clubshell | *Pleurobema clava* | E |
| Rayed bean | *Villosa fabalis* | C |

Status Codes: E=Endangered T=Threatened P=Proposed C=Candidate D=Delisted

[1] The bald eagle was delisted on August 8, 2007. While there are no ESA requirements for bald eagles after this date, the eagles continue to receive protection under the Bald and Golden Eagle Protection Act (BGEPA). Please follow the Service's May 2007 Bald Eagle Management Guidelines to determine whether you can avoid impacts under the BGEPA for your projects. If you have any questions, please contact the endangered species branch in our office.

Information current as of: 5/15/2008

# Attachment B

# Ball Hill Windpark
# Approvals Required
# (Part 1B-25)

# Approvals Required

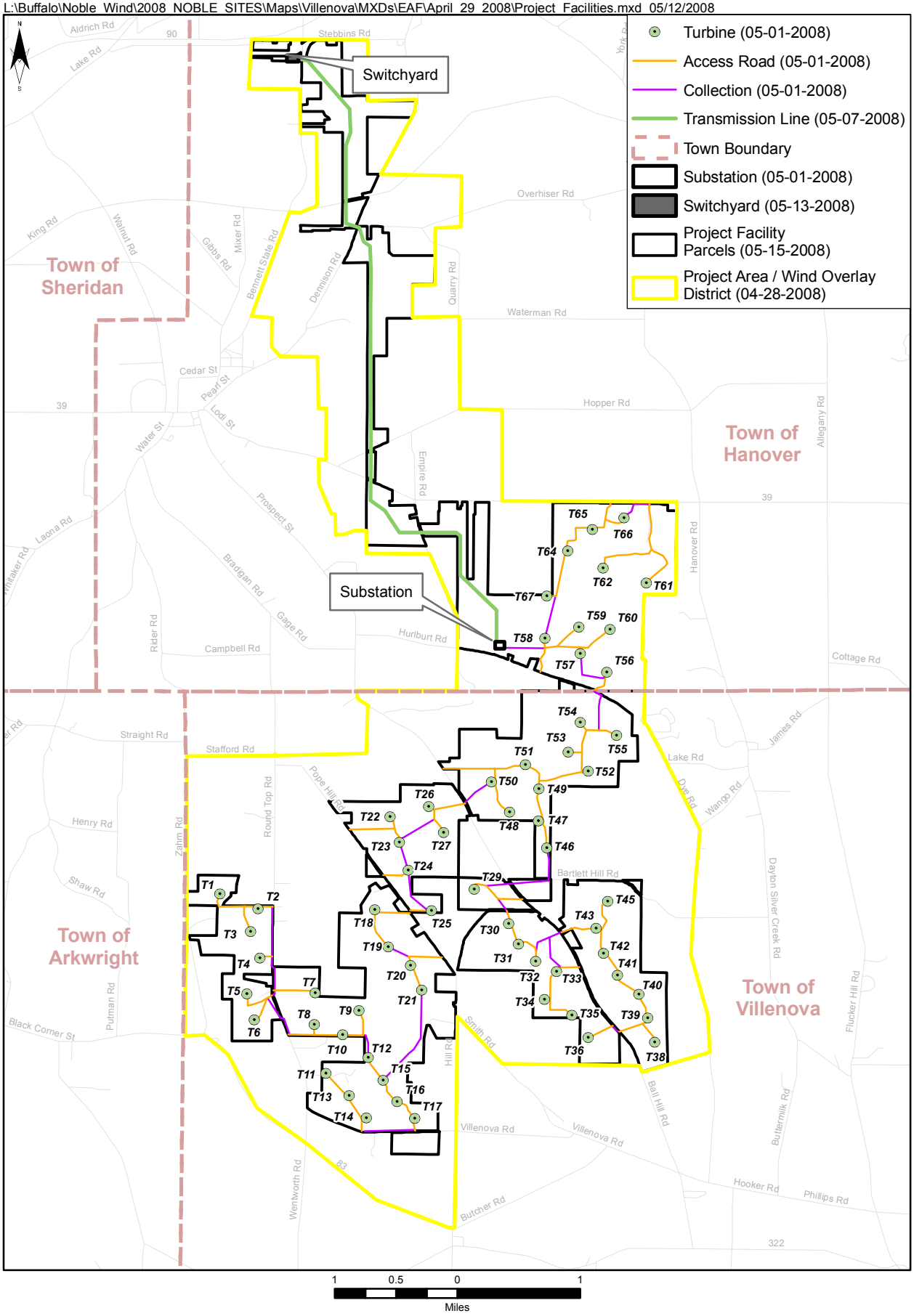
- Corresponds to EAF Section B, #25

| Permit or Consultation Required | Agency |
|---|---|
| Acceptance of DEIS, FEIS and issuance of findings | Town of Villenova Town Board (SEQRA Lead Agency) |
| Application for Wind Energy Conversion Systems and Wind Overlay District | Town of Villenova Town Board |
| Site Plan Approval | Town of Villenova Planning Board |
| | Town of Hanover Planning Board |
| Zoning Amendment | Town of Villenova Zoning Board |
| | Town of Hanover Zoning Board of Appeals |
| Section 404: Waters of the US | United States Army Corps of Engineers |
| Jurisdictional Determination | |
| Article 15 – Stream Disturbance Permit | New York State Department of Environmental Conservation |
| Article 24 – Freshwater Wetlands Permit | New York State Department of Environmental Conservation |
| Sect. 401: Water Quality Certification | New York State Department of Environmental Conservation |
| Article 17 - SPDES– General Permit for Stormwater Discharges from Construction Activity | New York State Department of Environmental Conservation |
| Obstruction to Aviation: Approved Lighting Plan | Federal Aviation Administration |
| State Road Use Permits | NYS Department of Transportation |
| County and Town Road Use Agreements | Chautauqua County Highway Superintendent |
| | Towns of Villenova and Hanover |
| Consultation | US Fish and Wildlife Service |
| Consultation | NYS Office of Parks, Recreation and Historic Preservation |
| Sect. 68 Certificate of Public Convenience and Necessity | NYS Public Service Commission |
| PILOT Plan Approval | Chautauqua County Industrial Development Agency |

# Attachment C

# Ball Hill Windpark
# Project Area Figure

© Ecology & Environment, Inc. GIS Department Project #002270.NP32
L:\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\EAF\April_29_2008\Project_Facilities.mxd 05/12/2008




Ball Hill Project Facilities

**Notice of Intent**

**STATE ENVIRONMENTAL QUALITY REVIEW ACT**
**NOTICE OF INTENT TO ACT AS SEQRA LEAD AGENCY**

Dated: May 20, 2008

This notice is issued pursuant to 6 NYCRR Part 617 of the regulations, implementing Article 8 of the Environmental Conservation Law, together known as the State Environmental Quality Review Act ("SEQRA").

The Town Board of the Town of Villenova (the "Town Board") has determined that the action described below is subject to SEQRA and may involve one or more other involved or interested agencies. The Town Board has made a preliminary determination that this is a Type I action in accordance with 6 NYCRR §617.6(a)(1)(iv), requiring coordinated review. The Town Board has stated its intent to act as lead agency. In the absence of written objections from any other involved agencies within thirty (30) days from the date of this notice, the Town Board will assume the lead agency role for this action pursuant to 6 NYCRR §617.6(b)(3)(i).

The applications, plans and full Environmental Assessment Form are attached for your information. The project sponsor has also indicated that it will prepare a Draft Environmental Impact Statement ("DEIS") to examine all significant adverse environmental impacts.

**Name of Action: Noble Ball Hill Windpark, LLC**

**SEQR Status:** Type I

**Description of Action:** The Project is located in the Towns of Villenova and Hanover, Chautauqua County, New York at various locations, and proposes the construction, operation and wind energy facility and associated infrastructure including but not limited to access roads, collection and transmission lines, and substation(s). The Project proposes construction of 63 turbines of 1.5 MW each (52 of which will be located in Villenova and 11 in Hanover) over an area of 5,616 acres.

**Other Interested and/or Involved Agencies:**

1. New York State Department of Environmental Conservation
2. New York State Office of Parks, Recreation and Historic Preservation
3. New York State Department of Transportation - Region Five
4. New York State Department of Public Service – PSC
5. United States Department of the Interior

6. U.S. Army Corps of Engineers

7. Federal Aviation Administration

8. Town of Hanover Zoning Board of Appeals

9. Town of Villenova Highway Department

10. Chautauqua County Highway Department

11. Chautauqua County Planning Department

12. Chautauqua County IDA

13. New York State Department of Agriculture and Markets

14. Town of Hanover Town Board

15. Town of Hanover Highway Department

**For Further Information:**

Contact Person: Daniel A. Spitzer, Esq.
Hodgson Russ, LLP
Address: 140 Pearl Street, Suite 100
Buffalo, New York 14202

**Date of Mailing:** May 21, 2008

**Notice of Intent Letters**

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

May 21, 2008

Donald Michalak, Esq.
Villenova Town Counsel
Attorney at Law
11 East Main Street, Suite 2
Fredonia, New York 14063

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intent to be Lead Agency

Dear Mr. Michalak:

Noble Ball Hill Windpark, LLC has submitted an application to the Town of Villenova to construct and operate the Noble Ball Hill Windpark, consisting of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review and has declared its intent to act as lead agency. I expect the Town to act to accept lead agency status by the end of June, 2008.

Enclosed for your review, please find a copy of a copy of the application (which contains an outline for the DEIS), Part I of the FEAF, and other supporting documentation.

Very truly yours,

Daniel A. Spitzer

DAS/klp
Enclosure

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

May 21, 2008

Jeff Passafaro, Esq.
Attorney at Law
Hanover Town Counsel
93 E. Fourth Street
Dunkirk, New York 14048

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intent to be Lead Agency

Dear Mr. Passafaro:

Noble Ball Hill Windpark, LLC has submitted an application to the Town of Villenova to construct and operate the Noble Ball Hill Windpark, consisting of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review and has declared its intent to act as lead agency. I expect the Town to act to accept lead agency status by the end of June, 2008.

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Enclosure

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Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

United States Department of Interior
1849 C Street, N.W.
Washington DC 20240

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

The purpose of this letter is to notify you of the Villenova Town Board's intent to act as lead agency and request that you consent to its doing so by signing the attached Notice of Intent and returning it to me as soon as possible.

Please note the Town previously enacted a comprehensive Local Law to regulate the placement of wind energy conversion systems, establishing minimum setbacks and maximum height and noise levels and creating a review process which requires in-depth analysis of the project's potential impacts, including noise studies, wetlands delineation and mitigation, aesthetic/visual assessment, impacts on farm lands, drainage issue and traffic impacts. In addition to special counsel, the town will hire independent consultants to assist in its environmental review.

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Very truly yours,

Daniel A. Spitzer

DAS/klp
Enclosure

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Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Hanover
Highway Department
11966 Hanover Road
Silver Creek, New York 14136
***Attention: Steve D'Angelo***

Dear Mr. D'Angelo:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Enclosure

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Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Villenova Zoning Board
1049 Butcher Road
South Dayton, New York 14138

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Daniel A. Spitzer

DAS/klp
Enclosure

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Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Hanover Zoning Board
68 Hanover Street
Silver Creek, New York 14136

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Daniel A. Spitzer

DAS/klp
Enclosure

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Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Hanover Planning Board
68 Hanover Street
Silver Creek, New York 14136

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Enclosure

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Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Hanover Board Members & Clerk
Town of Hanover
68 Hanover Street
Silver Creek, New York 14136

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

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Enclosure

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Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

NYSDEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, New York 12233-1750
***Attention: Rudyard Edick***

Dear Mr. Edick:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Enclosure

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Partner
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Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

New York State Department of Transportation
Region 5
107 Broadway
Hornell, New York 14843
***Attention: Alan E. Taylor***

Dear Mr. Taylor:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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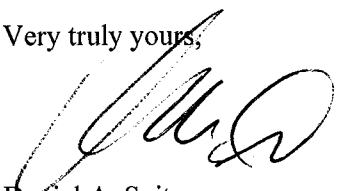

Daniel A. Spitzer

DAS/klp
Enclosure

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

NYS Department of State
41 State Street
Albany, New York 12231-0001
***Attention: Lori Heithoff, AICP***

Dear Ms. Heithoff:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Daniel A. Spitzer

DAS/klp
Enclosure

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

NYS Department of Public Service
3 Empire State Plaza
Albany, New York 12223-1350
***Attention: Douglas May***

Dear Mr. May:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Daniel A. Spitzer

DAS/klp
Enclosure

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

New York State Office of Parks,
Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189
***Attention: Ruth L. Pierpont***

Dear Ms. Pierpont:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

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Very truly yours,

Daniel A. Spitzer

DAS/klp
Enclosure

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

New York State Public Service Commission
3 Empire State Plaza
Albany, New York 12223-1350
***Attention: Andy Davis***

Dear Mr. Davis:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

US Fish & Wildlife
3817 Luker Road
Cortland, New York 13045
***Attention: Tim Sullivan***

Dear Mr. Sullivan:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Villenova Planning Board
1049 Butcher Road
South Dayton, New York 14138

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Town of Villenova Highway Department
9085 Round Top Road
South Dayton, New York 14138
*Attention: Lester L. Quinn*

Dear Mr. Quinn:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County Public Facilities Administration
454 N. Work Street
Falconer, NY 14733-1197
***Attention: George Spanos, Director***

Dear Mr. Spanos:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

NYSDEC
Region 9 Office
270 Michigan Avenue
Buffalo, New York 14203
***Attention: Chuck Rosenburg***

Dear Mr. Rosenburg:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

NYSDEC Region 9 Sub-Office
215 South Work Street
Falconer, New York 14706

Dear Sir/Madam:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, New York 14207
***Attention: Steven Metivier***

Dear Mr. Metivier:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County Legislature
1 North Erie Street
Mayville, NY 14757
***Attention: Janet Jankowski George***

Dear Ms. George:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County Planning Board
200 Harrison Street
Jamestown, NY 14701
***Attention: George Holt***

Dear Mr. Holt:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

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ATTORNEYS

May 21, 2008

New York State Public Service Commission
3 Empire State Plaza
Albany, New York 12223-1350
Attention: Hon. Jaclyn Brilling, Secretary to the Commission

Dear Hon. Brilling:

Re: Noble Ball Hill Windpark
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County IDA
200 Harrison Street
Jamestown, New York 14701
***Attention: William Daly, Director***

Dear Mr. Daly:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County SWCD
3452 Turner Road
Frank W. Bratt Ag Center
Jamestown, New York 14701-9607
***Attention: Fred Croscut***

Dear Mr. Croscut:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

FAA, Eastern Regional Office
Air Traffic Division, AEA-250
JFK International Airport
Fitzgerald Federal Building
Jamaica, New York 11430
***Attention: Manny Weiss***

Dear Mr. Weiss:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Historic Preservation Field Services Bureau
Delaware Avenue
Cohoes, New York 12047
***Attention: John Bonafides***

Dear Mr. Bonafides:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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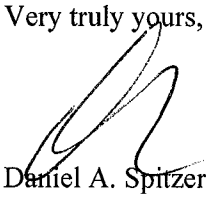

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Hodgson Russ LLP
ATTORNEYS

May 21, 2008

New York State Department of Agriculture and Markets
158 Main Street
Mt. Morris, New York 14510
***Attention: Mike Saviola***

Dear Mr. Saviola:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
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Very truly yours,

Daniel A. Spitzer

DAS/klp
Enclosure

## Lead Agency Letters

# STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE

**THREE EMPIRE STATE PLAZA, ALBANY, NY 12223-1350**
**Internet Address: http://www.dps.state.ny.us**

RECEIVED
JUN 21 2008
By PETER McGOWAN
*Acting General Counsel*

**PUBLIC SERVICE COMMISSION**

**GARRY A. BROWN**
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*Commissioners*

**JACLYN A. BRILLING**
*Secretary*

June 18, 2008

Daniel A. Spitzer
Special Counsel, Town of Villenova
Hodgson Russ LLP
The Guaranty Building
140 Pearl Street, Suite 100
Buffalo, NY 14202-4040
dspitzer@hodgsonruss.com

Re: SEQRA Lead Agency Request by Town of Villenova, Chautauqua County- Noble Ball Hill Windpark, LLC

Dear Mr. Spitzer:

The Department of Public Service (DPS) has reviewed the request by the Town of Villenova for Lead Agency Status dated May 21, 2008 for the application by Noble Ball Hill Windpark, LLC (the Company) to develop a 94.5 megawatt (MW) wind energy project (Project) in the Town of Villenova and extending into the Town of Hanover, Chautauqua County.

DPS includes the Staff of the Public Service Commission (PSC) and will be an involved agency in the State Environmental Quality Review Act (SEQRA) review of the Project. Pursuant to Public Service Law (PSL) §68, the Company will be required to obtain a Certificate of Public Convenience and Necessity. The §68 review includes consideration of the capacity of the developer to function as an electric corporation and to provide safe and reliable service.

DPS has participated as an involved agency in many SEQRA reviews of independent power production facilities, pursuant to its responsibility under PSL §68. The §68 review can only proceed following receipt of an application from the developer, including a verified statement by a responsible official of the company showing that it has received all legally required municipal consents giving it the right to use town property, such as the rights-of-way for public streets. Consideration of the §68 review will also require that

DPS coordinate review with the Office of Parks, Recreation and Historic Preservation (OPRHP) pursuant to §14.09 of the Parks, Recreation and Historic Preservation law, unless there is a federal agency review that implements §106 of the National Historic Preservation Act.

DPS has reviewed the developer's Full Environmental Assessment Form (EAF). Since the Project has significant impact on the environment, a Draft Environmental Impact Statement (DEIS), which the developer has agreed to prepare, must be required and the following concerns should be thoroughly addressed.

The Company has stated that the DEIS will cover analysis showing compliance with all design requirements set forth in Sections 17 parts (a) through (f) of the Town Law, including but not limited to a visual impact assessment including an analysis of shadow flicker, a fire protection and emergency plan, a sound impact assessment, property value report, a communication signal study to analyze potential electromagnetic interference, a bird and bat risk assessment, a wetland delineation report and mitigation plan, traffic and transportation plan, a decommissioning plan, a health and safety plan, an architectural survey report and Phase 1 archaeological survey, and storm water pollution prevention measures.

The DEIS should address relevant impacts on cultural resources, natural resources, wildlife and wildlife management areas. Bird and bat studies should include an adaptive management strategy to reduce project operational effects if significant effects are observed in the post construction monitoring plans.

View shed analysis should include consideration of short range and long range views on important visual resources. The applicant should document and analyze potential impacts in accordance with the list of visual resources included in the Department of Environmental Conservation's Visual Policy Statement. Specific visual contrasts should be assessed, characterized and described; visibility should be demonstrated through view shed mapping, line of sight analysis and photo simulation. Strategies to avoid or minimize significant impacts through consideration of mitigation measures should be demonstrated. Alternative analysis should include consideration of alternative scale projects and alternative layouts to avoid specific direct impacts on significant resources.

Delivery of massive turbine components may necessitate considerable road/ bridge/culvert improvements including widening of roadways at critical intersections, raising or relocating overhead utility wires at road crossings and reinforcement of road surfaces. DPS recommends that traffic and transportation plan should be thoroughly addressed with the NY State Department of Transportation (NYSDOT), Town Highway Departments, and County Highway Departments. Heavy use of the local roads may cause disturbance to the roads. Seasonal limitations, restoration standards and possible financial assurances for roadway improvements and restoration may be appropriate mitigation for construction impacts.

Potential environmental impacts on natural resources due to facility construction that should be considered include water resources, such as water quality effects of storm water runoff on wetlands and streams in the vicinity of wind turbines and down

slope from construction sites and access roads. Habitat characterization and evaluation of potential changes in habitat must be documented and analyzed.

The assessment of environmental impact should consider the full scope of equipment and construction that will likely be required by the Project facilities including any upgrades to transmission facilities necessary to accommodate the interconnection and facility output.

Air quality impact assessment and any characterization of emission reductions for other generating facilities offset by output of the proposed project should be based on analysis of production and transmission system limitations.

Siting considerations for the substation may include soils and bedrock limitations on system grounding and possible interference with other electric and communication facility grounding and protection systems. The suitability of the soil and the bedrock depth should be identified for the substation site. The DEIS should include switch yard and substation design drawings and site plans. Assessment of potential effects on existing communication systems from facility siting will also be necessary.

The DEIS should clearly identify on a map the offset of the turbines and substation from the local, county and state roads, residences, transmission facilities designed to operate at 115 KV or more and buried gas infrastructure.

Reasonable efforts should be made to avoid, minimize or mitigate the effects on wetlands and streams in accordance with DEC standards.

DPS seeks to actively participate in the SEQRA review process, including review of scoping topics and methodologies, review of alternatives and mitigation measures appropriate to avoid environmental and community impacts. Cultural resource evaluation must be included in the DEIS, including consideration of potentially eligible resources.

DPS consents to the Town of Villenova proceeding as the Lead Agency, provided that the town is able and willing to administer a comprehensive review of impacts including assessment of cumulative impacts of the proposed wind project with other local development proposals. The town should require that the issues and regulatory requirements identified above be addressed in adequate detail to demonstrate a hard look at impacts, and fully develop findings. Findings should be specific to address the issues identified in the EAF and in this correspondence to enable the PSC to adopt the environmental review and make requisite findings regarding the public interest, public convenience and necessity in its consideration of the developer's request pursuant to PSL §68.

The SEQRA review should consider appropriate mitigation of potential adverse impacts, which may include alternative communication technologies, removal or relocation of individual wind energy structures and alternative routes. Mitigation strategies for visual and historic resource impacts may be appropriate based on results of visual studies and further consultations. Mitigation of impacts on visual, cultural or community-defining elements may include facility relocations, development of screening or reduced project scale. Mitigation of impacts to the electric transmission system may include addition of significant transmission capability.

DPS advises that additional notice and solicitation of interest should be provided to agencies including OPRHP, NYSDOT and County Highway Agencies. DPS strongly encourages the Lead Agency to require full public scoping of topics and methodologies for environmental impact statement analysis.

Please contact Philipose Philip at 518-486-6075 regarding further Project reviews and environmental assessment scoping.

Thank you for consideration of these comments.

Sincerely,

James D. Austin
Chief, Environmental Certification & Compliance
Office of Energy Efficiency & the Environment

cc: Philipose Philip
Andrew Davis
J. Bonafide, OPRHP
R. Edick, NYS DEC
M. Saviola, NYS Ag. & Mkts.

STATE OF NEW YORK
**DEPARTMENT OF STATE**
ONE COMMERCE PLAZA
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ALBANY, NY 12231-0001

DAVID A. PATERSON
GOVERNOR

LORRAINE A. CORTES-VAZQUEZ
SECRETARY OF STATE

RECEIVED
JUN 05 2008
By

May 29, 2008

Mr. Daniel Spitzer
HodgsonRuss LLP
140 Pearl Street, Suite 100
Buffalo, NY 14202

Re: Noble Ball Hill Windpark Notice of Intent to be Lead Agency

Dear Mr. Spitzer:

This letter is to signify that the New York Department of State consents to the Villanova Town Board's acting as lead agency in the coordinated review of the proposal in the towns of Villanova and Hanover to construct and operate 63 wind energy conversion systems.

Very truly yours,

Mark Streb
Director, Division of Local Government

**New York State Department of Environmental Conservation**
**Division of Environmental Permits, 4th Floor**
625 Broadway, Albany, New York 12233-1750
**Phone:** (518) 402-9167 • **FAX:** (518) 402-9168
**Website:** www.dec.state.ny.us

Alexander B. Grannis
Commissioner

RECEIVED
JUN 19 2008
By

June 16, 2008

Daniel A. Spitzer
The Guaranty Building
140 Pearl Street
Suite 100
Buffalo, New York 14202-4040

**Re: State Environmental Quality Review (SEQR)**
**Noble Ball Hill Windpark**
**Towns of Villenova and Hanover, Chautauqua County**

Dear Mr. Spitzer:

The New York State Department of Environmental Conservation (DEC) has performed an initial review of the Full Environmental Assessment Form (EAF) for the project identified above. The EAF was provided to DEC with a letter from the Town of Villenova Town Board, dated May 21, 2008, to request Lead Agency status pursuant to the State Environmental Quality Review Act (SEQR). The Town Board has received an application from Noble Ball Hill Windpark, LLC to authorize the construction and operation of a wind power project consisting of 63 wind energy conversion systems (turbines).

The project is described as a 94.5 megawatt (MW) wind energy facility consisting of up to 63 wind turbines (1.5 MW each) and spread over 13,101 acres with 52 turbines in the Town of Villenova and 11turbines in the Town of Hanover. At least 17 miles of access roads will be constructed in conjunction with the turbines with 13 miles in the Town of Villenova and 4 miles in the Town of Hanover. Moreover, 23 miles of electrical collection system will be constructed with 18 miles in the Town of Villenova and 5 miles in the Town of Hanover. A new substation, switchyard, and 6-mile overhead 115-kV transmission line will be constructed in the Town of Hanover.

**1) Lead Agency**. DEC does not object to the Town of Villenova Town Board assuming the role of lead agency to conduct the SEQR review. However, DEC has substantial concerns for the potential impacts of certain aspects of this project and strongly urges the Town Board to require the preparation of a Draft Environmental Impact Statement (DEIS). The comments provided in this letter support this recommendation and identify concerns DEC has with wind projects. DEC recommends that formal scoping be conducted to allow for ample participation by the public and involved and interested agencies in the preparation of the scope of the DEIS. DEC expects to provide further comments during the scoping process. The DEIS should discuss the potential

cumulative impacts from all existing wind energy projects and active proposals for wind power projects in the near vicinity such as New Grange Wind Project and Picket Brook Windpark. SEQR milestones such as determining DEIS completeness, scheduling public hearings, and establishing the deadline for comments are subject to preparation, filing, publication and distribution requirements of SEQR regulations at 6 NYCRR 617.12.[1]

**2) Department Jurisdiction**. DEC authorizations for construction of wind energy facilities typically include an Article 24 Freshwater Wetlands permit, Article 15 Stream Disturbance permit, and a Clean Water Act Section 401 Water Quality Certification. NYS DEC wetlands are present within the project area with initial indications of 238.32 acres. The SEQR Full EAF states that freshwater wetlands will be further delineated in its application to the DEC. Streams classified as C(t) are protected under DEC regulations and can potentially be disturbed by the project. A portion of the project development area is included in National Wetland Inventory maps, which show potential federal wetlands in the mapped area. In addition, if the project will have an impact on endangered and/or threatened species, the Department will have jurisdiction under Article 11 of the Environmental Conservation Law. That determination remains to be made and will first require consultation with the Department's Staff. However, the actual breadth of DEC's jurisdiction can not be determined definitively until the location of the turbines, access roads, electrical interconnection lines, construction laydown areas, etc., are fully described.

Approval is also required to discharge stormwater during the construction of the facility. This approval is administered as a general permit under the State Pollutant Discharge Elimination System (SPDES) program (SPDES General Permit for Stormwater Discharges from Construction Activities, GP-0-08-001).

**3) Project Description.** The DEIS should provide a complete description of the proposed project scope, including the proposed number and location of turbines, turbine type, size and rotor swept area, existing and proposed access roads, underground and overhead transmission line routes (including any new transmission lines required for connection to the grid), temporary and permanent meteorological (met) towers, temporary and permanent laydown/construction staging areas, project office, substation, and any other project development components that will potentially affect existing conditions in the project development area (e.g., wetland mitigation sites).

The project description should also include discussion of transportation routes for delivery of materials to the project development area, particularly where road improvements may be required that impact wetlands or streams. The source and quantity of gravel required for construction of temporary and permanent access roads, and the location and capacity requirements of any proposed concrete batch plants, should be described. The source and quantity of water required for construction should also be described.

**4) Project Impacts**. Based on experience with existing and proposed wind farms, DEC recommends that the DEIS include detailed discussion of the following issues of primary concern to the agency.

[1] 617: State Environmental Quality Review, Available: http://www.dec.ny.gov/regs/4490.html#18098

***Bird and Bat Impacts.***

DEC has not yet been contacted by the project sponsor to develop methodologies for pre-construction avian/bat studies in the project area. The DEC requests the project sponsor set up a meeting with DEC Fish, Wildlife, and Marine Resources staff as quickly as possible to discuss the appropriate bird and bat studies to be conducted in preparation of the Draft Environmental Impact Study (DEIS).

In conjunction with consulting with the DEC, the project sponsor should use the draft "Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects" in designing their bird and bat studies.[2] The following paragraphs touch on some of the important points from these guidelines in constructing the DEIS.

The DEIS should include results of a habitat and nest/roost site survey targeting any listed endangered, threatened or special concern fish and wildlife species that exist in the project development area, or may be affected by proposed project development activities. Measures to avoid adverse impacts to birds and bats should be described. These measures should include: 1) avoidance of construction in critical habitat areas; 2) scheduling construction to avoid interruption of breeding and nesting activities; and 3) re-location or elimination of specific project components (including but not limited to turbines, access roads, and transmission/distribution interconnect routes) if any of these are determined to result in an actual or potential adverse impacts.

Where impacts to birds, bats, or other endangered or threatened species cannot be avoided, mitigation measures should be devised. Mitigation measures might include, but are not limited to: 1) removal or re-location of specific turbines, 2) short-term shutdown for certain hours or days during peak migration or other identified high-risk periods; and 3) feathering blades at slow wind speeds to reduce risk of bat mortality. Conservation easements, land purchases, and other habitat management techniques may also be appropriate mitigation options. Development of any mitigation plans should be done in consultation with DEC.

Plans for post-construction monitoring to collect data on the estimated collision mortality rate of birds and bats that pass through and use the project site during project operation should be described in the DEIS. A post-construction habitat avoidance/displacement study should also be developed to study the effects of the wind energy facility on nesting grassland birds. DEC will require a post-construction study and mitigation for any permits that may be required from the agency for construction of the project. DEC recommends that the project sponsor consult with the Department and the U.S. Fish and Wildlife Service in developing protocols for the post-construction monitoring plan.

To minimize a potential collision hazard, DEC recommends that all temporary and permanent meteorological (met) towers be free-standing towers without guy wires.

The DEIS should discuss the windpark's potential bat impacts in light of the catastrophic loss of many species of bat due to white nose syndrome. The recent loss may lead to impacted bat species being listed as threatened and/or endangered.

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[2] New York State Department of Environmental Conservation. Draft Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Project. ONLINE. December 2007. Available: http://www.dec.ny.gov/docs/fish_marine_pdf/drwindguide1207.pdf

***Natural Resource Impacts.***

*Wetlands and streams.*

Wetland delineation reports for any areas that would be impacted by project construction, as outlined in the project description above, should be provided in the DEIS. In addition, the DEIS should provide wetland delineation reports for wetland areas along public roads and intersections where improvements are necessary to deliver project materials (road widening, increasing turning radii, modifications to culverts).

The DEIS should discuss how the proposed project will avoid, minimize or reduce potential wetland impacts. This discussion should include specifications for construction activities that limit impacts to surface waters, wetlands and underground waters. These specifications should include, but are not limited to, erosion and sediment controls, proper handling of concrete during construction of turbine pads, installation of controlled concrete washout areas, storage of fuel and chemicals outside of wetland adjacent areas, and spill prevention and response. It should also discuss alternative project designs that were examined to avoid and reduce impacts to wetlands - required before DEC considers mitigation as an option to compensate for unavoidable impacts. This discussion should assess whether there are overriding economic and social needs for the project that outweigh the environmental costs of impacts on the wetlands.

A clear distinction should be made between "temporary" and "permanent" wetland impacts. Simple re-grading to pre-construction contours following excavation in a wetland area may not be enough to restore the full function of the existing wetland area. Clear-cutting of forested wetland represents a permanent wetland impact, which must be factored into total wetland disturbance for which permits and mitigation are required.

If unavoidable wetland impacts are expected to result from project construction activities, the DEIS must include a discussion of compensatory mitigation being considered, including potential locations for mitigation sites. Proposed mitigation must conform to DEC wetland mitigation guidelines.[3] Included in this discussion should be the proposed legal mechanism to secure long term access and management of compensatory mitigation sites (e.g., ownership, permanent easement, or transfer to third-party conservancy organization). For DEC permits, the structure of this agreement must be in a form acceptable to the Department.

A detailed map of streams within the project development area and DEC classification should be included in the DEIS. Access roads, overhead and underground interconnects, or other project components that cross or are located in close proximity to any stream classified as C(t) or higher need to be included on this map. Determinations regarding the navigability of streams to be crossed or impacted pursuant to the definition of "Navigable Waters of the State" found in 6 NYCRR Part 608 (l) need to be included. If a "navigable" determination is made, an Article 15 Title 5 Permit for the "Excavation and Fill of Navigable Waters" may be required. Where access roads or interconnect lines are proposed to cross streams, specifications for culvert design and

[3] New York State Department of Environmental Conservation. *Freshwater Wetlands Regulation Guidelines on Compensatory Mitigation*. ONLINE. 29 Oct. 1993. Available: http://www.dec.ny.gov/docs/wildlife_pdf/wetlmit.pdf [15 Jun. 2007].

sizing, culvert installation techniques, tree clearing or other activities that affect the stream should be discussed.

*Habitat Fragmentation and Loss.*

As windparks typically represent large scale development in rural areas with many miles of new roads and new electrical lines in addition to the turbines themselves, a discussion of potential habitat fragmentation for local species should be included. The impact of the large amount of deforestation (120 acres) that will occur due to this project should also be discussed in this light.

*Significant or unique plant communities.*

A habitat survey to identify threatened or endangered plants and associated ecological communities located within the project area should be conducted and results included in the DEIS. Potential impacts to these resources that may result from construction of the project should be discussed, and if adverse impacts are identified, proposed mitigation options should be described.

*Endangered, Threatened, or Special Concern Fish & Wildlife Species.*

The DEIS should include a habitat and nest/roost site survey for any state or federally listed endangered, threatened or special concern fish and wildlife species that exist in or may be affected by proposed activities. Information regarding which species may be in the area can be obtained from the Natural Heritage Program, DEC regional biologists, USFWS, and local non-profit organizations such as The Nature Conservancy and Audubon Society. The project sponsor should consult with DEC for further details on the design of these investigations. If the results of the recommended surveys indicate that potential impacts to a listed species may occur as a result of project activities, the DEIS should include potential mitigation measures to avoid or minimize these impacts.

*Invasive Species.*

The control of invasive species to minimize the spread of invasive propagules throughout the project development area, and particularly in regulated wetland and stream areas, should be discussed in the DEIS. The discussion should include measures to ensure no net increase in the areal coverage of invasive species in the project development area. Post-construction monitoring and periodic management, including invasives control and re-planting of preferred indigenous species to ensure survival should also be included in the discussion. An Invasive Species Control Plan will be a requirement of any permits issued by DEC.

***Visual Impacts.***

DEC recommends that a visual analysis consistent with *Assessing and Mitigating Visual Impacts, DEP-00-2* ("DEC Visual Policy")[4], be prepared and included in the DEIS. The visual analysis should identify which of the 15 resource categories listed in section V (A) of the DEC Visual Policy may be impacted by the project, and describe specific aesthetic resources of

[4] New York State Department of Environmental Conservation. *Assessing and Mitigating Visual Impacts.* ONLINE. 31 Jul. 200. DEP-00-2. Available: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/visual2000.pdf

statewide significance within each category, and how they may be visually impacted by the project. DEC Visual Policy recommends that the assessment examine an area greater than 5 miles from the turbines if there are any potential sensitive receptors as described in section V (B). The visual analysis should include graphic representations that show the locations of identified sensitive visual receptors together with a viewshed analysis to clearly show which sensitive receptors will be affected by views of the project. This analysis should also include state and national register eligible (NRE) resources identified in the architectural survey prepared in accordance with the cultural resources investigation (see below).

The visual assessment should include an analysis of factors that may cause a diminishment of the public enjoyment and appreciation of specific affected aesthetic resources in the project development area visually impacted by the project. Analysis must include factors that define the resource as an aesthetic resource, the visual setting, and the magnitude of the visual impact on the resource.

Mitigation options described in Section D of the DEC Visual Policy, including Professional Design and Siting, Maintenance, and Offsets, should be fully evaluated in the visual assessment, including discussion of the feasibility of employing direct mitigation for visual impacts to specific impacted aesthetic resources (e.g., screening, elimination or re-location of one or more proposed turbines). Where a determination is made that direct mitigation of a specific aesthetic resource is not practicable, the rationale for this determination should be provided. Where it is determined that direct mitigation is not practicable, DEC visual policy recommends consideration of visual offsets. This process is most appropriately conducted in concert with the cultural resources review prepared in accordance with state or federal historic preservation review processes (see below).

***Cultural and Archeological Resources.***

If any state agency approvals or permits are needed for this project, compliance with the New York State Historic Preservation Act of 1980, Section 14.09, will be necessary. In addition, should federal agency approval or permitting be needed, compliance with Section 106 of the National Historic Preservation Act will be required. Review under state Section 14.09 is not required when the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) is acting in its role of State Historic Preservation Officer (SHPO), and reviewing a project under federal Section 106 (14.09 State Regulations, Section 428.2(a)). If state or federal agencies are not involved in this project, the lead agency should consider consultation with OPRHP in order to make decisions regarding potential impacts to significant historic and cultural resources.

The DEIS should identify the extent of state or federal agency involvement and discuss the status and results of any historic preservation studies undertaken. Consultation with OPRHP is recommended to discuss possible methodology for conducting cultural resource investigations. Consultation regarding eligibility of properties, probable impact determinations and possible mitigation measures should be done prior to preparation of the DEIS. The results of that consultation, with supporting documentation, should be presented in the DEIS. This process should be conducted in concert with the visual assessment prepared in accordance with the DEC visual policy (see above).

Adverse impacts identified through consultation with OPRHP are generally subject to resolution through a Memorandum of Agreement (MOA) that identifies applicable mitigation

measures to offset the anticipated adverse impacts. The DEIS should therefore describe potential mitigation measures or methodologies to identify potential mitigation measures based on expected adverse impacts to cultural resources.

**5) Project Construction and Operation.**

***Environmental monitor.***

The DEIS should include an environmental monitoring plan that provides for an independent monitor to oversee the various mitigation activities identified during the course of the environmental review. The monitor must possess a working knowledge of state and federal regulations, natural resources (wetlands, streams, state and federally listed species and their habitat requirements, and any other unique local natural features), and be familiar with construction activities. The monitor will observe and report as to adherence to all permits, permit conditions, construction design plans and specifications. He or she must also have authority to stop construction activities when non-compliance is observed and to require that corrective action be taken.

DEC recommends that all environmental protection provisions identified during the environmental review be incorporated into project construction performance specifications. These conditions should be included in agreements with contractors, making it clear that the contractors, employees, agents and assigns are responsible to comply with terms and conditions of environmental permits while acting as agents of the project sponsor with respect to permitted activities, and such persons are subject to the same sanctions for permit violations as prescribed for the project sponsor.

***Environmental Restoration.***

A thorough discussion of environmental restoration activities to be conducted post-construction should be included in the DEIS. This discussion would include details of re-grading and stabilization of temporary impacts to wetlands and streams, including re-establishment of wetland hydrology (if disrupted); restoration of disturbed habitat, including re-planting suitable species in wetlands, adjacent areas and streams; wetland mitigation project construction; stabilization of disturbed areas subject to the SPDES Stormwater General Permit; removal and proper disposal of temporary road materials; and re-grading soil in agricultural and forested areas

in accordance with NYS Department of Agriculture and Markets guidelines or other Best Management Practices.

***Operations and maintenance.***

An Operations and Maintenance (O&M) Plan should be developed and included in the DEIS. The O&M Plan should describe environmental considerations to be included in the ongoing maintenance of the facility, a contingency plan to assess and minimize environmental impacts during major repairs, and assessment and mitigation of environmental impacts during the decommissioning process. Specific considerations to be included, at a minimum:

1. Wetland mitigation project maintenance.

2. On-going monitoring and management to ensure that restoration activities are successful and maintenance activities avoid future wetland impacts, i.e., limits on tree clearing in sensitive wetland areas.

3. Invasive species control.

4. General maintenance and repair of roads.

5. Right-of-Way management of overhead and underground electrical interconnects.

6. Contingency plans for access to project components that require major repair (major turbine service, overhead line loss).

7. Spill response plan for incidents involving release of hazardous chemicals.

8. A response plan in case impacts to the environment, such as birds and/or bats, exceed those predicted by pre-construction studies and analysis.

9. Opportunities for creation of additional environmental enhancements beyond those required for restoration and mitigation, through cooperative partnerships with landowners, state or local agencies, educational and conservation organizations.

DEC appreciates the opportunity to comment on the project at this early stage and looks forward to working with the Town of Villenova throughout the remainder of the SEQR and permit review process. If you have any questions, you may contact Mr. Rudyard Edick, Project Manager, by phone at (518) 402-9150, or by email at rgedick@gw.dec.state.ny.us.

Sincerely,

Jack A. Nasca
Chief, Energy Projects and Management
Division of Environmental Permits

cc: Noble Ball Hill Windpark, LLC
Y. Park, Town Supervisor, Town of Villenova
K. Tampio, Town Supervisor, Town of Hanover
W. Daly, Chautauqua Industrial Development Agency
A. Davis, NYS DPS
M. Brower, Ag. & Mkts.
J. Bonafide, OPRHP
M. Crawford, USACE
T. Sullivan, USFWS
S. Doleski, DEC Region 9
DEC Review Team

OFFICE OF PARKS·RECREATION·HISTORIC PRESERVATION
NEW YORK STATE

**New York State Office of Parks, Recreation and Historic Preservation**

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RECEIVED
JUN 16 2008
By

**David A. Paterson**
Governor

**Carol Ash**
Commissioner

June 11, 2008

Mr. Daniel A. Spitzer
Hodgen Russ, LLP
140 Pearl Street, Suite 100
Buffalo, NY 14202-4040

Re: PSC/SEQRA
Noble Ball Hill Wind Farm
Villenova/Hancock, Chautauqua County
08PR01814

Dear Mr. Spitzer:

Thank you for providing this office with a copy of Noble's application to the town of Villenova for the proposed construction of a 63 turbine wind generation facility. We have no interest in serving as Lead Agency for this project but do seek to be identified as an interested agency in the SEQRA process.

As the state agency responsible for the assessment of the state's historic and cultural resource, we welcome an opportunity to work with your client town in providing comments/guidance on the potential impacts to historic/cultural properties associated with the development of a wind farm.

We have enclosed a copy of the scope of cultural resources survey work that is recommended by this office. These guidelines would be the minimum level of review that would be acceptable to this office. Also be aware that a project of this size will be under review by the New York State Public Service Commission and, as such, will trigger a Section 14.09 (NYSPRHPL) review. Please be aware that we previously provided similar information to Noble.

If you or your client community would like to discuss the scope of work or have any questions, please do not hesitate to contact me at 518-237-8643, ext.3263.

Sincerely,

John A. Bonafide
Historic Preservation Services
Coordinator

enc: NYSHOP Wind Farm Survey Guide

cc: Andrew Davis, PSC

An Equal Opportunity/Affirmative Action Agency

printed on recycled paper

# New York State Historic Preservation Office
# Guidelines for Wind Farm Development Cultural Resources Survey Work

The New York State Historic Preservation Office has established the following guidelines for the assessment of historic and cultural resources associated with the development of wind farm projects in New York State.

## Survey for Historic Buildings

1. Establish a five-mile Area of Potential Effect (APE) around the project site.
    i. Establish boundary of APE using topographic survey to determine where project may be visible from.

2. Conduct field survey within the positive visual APE as defined by topographic study.

3. Using NYSHPO data, the survey will initially identify all buildings/sites within the study area that were previously determined eligible for inclusion in or are already listed in the New York State and National Registers of Historic Places.

4. The survey will assess all buildings 50 years old or older within the study area. Surveyors will determine potential State and National Register eligibility of each resource using the National Register Criteria for Evaluation.
    i. Surveyor will schedule a meeting with NYSHPO staff prior to undertaking survey work to verify the APE.
    ii. Surveyor will schedule a meeting with NYSHPO staff after completion of survey of mile-1 "ring" of study area to verify eligibility determination methodology. Meeting will review properties determined eligible and will provide a sampling of resources determined not-eligible.
    iii. After evaluation methodology is verified by the NYSHPO, survey of remaining APE area will be completed.
    iv. All properties previously listed in the State and/or National Registers in addition to all properties determined eligible prior to the survey and as part of the project survey are to be marked using a single GPS point. The single point should be taken at the edge of the property generally at the mid-point of the property's street frontage.
    v. The GPS data will be linked to the street address and/or SHPO Unique Site Number (if one already exists).
    vi. All survey data will be provided to the NYSHPO in a standardized format that will be discussed at the initial pre-survey meeting.

**Archaeological Survey**

1. Phase I Archaeological Survey is recommended for all wind farm project areas.

2. Archaeological Survey will be limited to the *Archaeological* Area of Potential Effect (APE) associated with the construction of the project. This smaller core of the project APE is composed of areas that will experience ground disturbing activity during the construction phase of the project. These areas include but are not limited to:
    i. Turbine sites
    ii. Construction staging areas
    iii. Borrow pits
    iv. New/Access Roads
    v. Utility corridors
    vi. New building locations
    vii. Other areas where the current ground surface may be modified as a result of the project.

3. Phase I survey will be conducted by sampling Environmental Zones. Necessary steps in this process include:
    i. Determining the total acreage of the *Archaeological* APE.
    ii. Determining the total number of shovel tests recommended for the *Archaeological* APE by multiplying the acreage by 16 shovel tests per acre.
    iii. Identifying the various environmental zones within the *Archaeological* APE following Robert E. Funk's 1993 work, *Archaeological Investigations in the Upper Susquehanna Valley, New York State* (Chapter 5).

4. Once the zones are defined, the archaeological consultant will divide up the total number of shovel tests previously determined and apply an equal percentage of tests to each defined environmental zone. Any previously identified archaeological site(s) or map documented structure (MDS) must be included in the Phase IB testing.

5. Within each zone shovel testing will be conducted using a five meter interval or other acceptable methods such as plowing/disking for previously plowed farm land.

6. Prior to implementing a proposed testing methodology the project consultant will schedule a meeting with SHPO staff to consult on the proposed plan. A copy of the plan will be provided for SHPO staff review in advance of the meeting.

7. Sites, identified as part of the survey process will be documented using standard practices (such as site forms or approved data bases) and will all be located using a single GPS point.

8. Once the Phase I survey is completed a report will be provided to the SHPO using the established New York SHPO Phase I Archaeological Report Format Requirements and the Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State.

**Electronic Survey Data**

1. Project sponsors will provide the following data sets to the SHPO as part of their submission. Sponsors or their consultants should contact the SHPO staff to verify specific data requirements.
    i. GIS data coverage defining the five-mile survey area.
    ii. GIS data locating (as best as practical) each of the proposed tower locations.
    iii. GPS data locating by singe point each building, structure, object or site identified as being eligible for or listed in the New York State and/or National Registers of Historic Places.
    iv. GIS data locating the boundary of all archaeologically tested areas.
    v. Final archaeological reports should be provided in bound format (see New York SHPO Phase I Archaeological Report Format Requirements) as well as in PDF format on CD.

2. Project's consultant should contact SHPO staff to determine exact format of data to be submitted.

For more information about the New York State Historic Preservation Office, please call us at 518-237-8643 or visit our web site at **http://nysparks.state.ny.us** then select **HISTORIC PRESERVATION.** Select the **On Line Resources** option to find specific information regarding historic and cultural resources in any community in the state.

RECEIVED
MAY 28 2008
By

STATE OF NEW YORK
DEPARTMENT OF AGRICULTURE AND MARKETS
10B Airline Drive
Albany, New York 12235

*Division of Agricultural Protection*
*and Development Services*
*518-457-7076*
*Fax. 518-457-2716*

May 27, 2008

Daniel A. Spitzer
Hodson Russ, LLP
140 Pearl Street, Suite 100
Buffalo, NY 14202-4040

**Re: Proposed Noble Ball Hill Windpark**

Dear Mr. Spitzer:

The New York State Department of Agriculture & Markets received a copy of an application from Noble Environmental Power to construct, operate and maintain a wind power project in the Towns of Villenona and Hanover, Chautauqua County. The Department has observed and monitored the construction of several wind farms in New York and has identified several impacts to agricultural resources that can occur as a result of such projects. Below are the Department's comments concerning the agricultural impacts, for consideration during the Town's review of this project.

There are two types of agricultural impacts that result from the construction of wind farms: One is the permanent loss of active agricultural land as a result of the construction/installation of 17 miles of access roads, 63 turbine sites, 6 mile overhead electrical transmission line and substation and switchyard required for the interconnection between the wind farm and the existing electric transmission line in the Town of Hanover. The second impact is the damage to soil resources in areas disturbed during construction. Both of these impacts can be minimized or eliminated by closely following the Department's *Guidelines for Agricultural Mitigation for Windpower Projects* (Rev. 4-8-08) as well as with proper planning and communication.

The proper siting of the access roads, towers and overhead transmission line can significantly reduce the amount of land permanently lost from active agricultural production as a result of this type of project. For example, constructing a permanent access road through the center of an active agricultural field can significantly reduce the efficiency of the farm tillage and harvest (cropping) operations. Generally, the preferred method is to locate roads and tower sites along the edges of fields; resulting in the least amount of productive agricultural land removed or lost from the farm operation's cropping system.

Loss of productive farmland (permanent conversion to a non-agricultural use) can also occur at the point of connection between the wind farm and the electric transmission line. Good communication is essential between the Department, the Project Applicant, the landowner, and the utility company concerning the transmission line interconnection. All parties need to fully understand the type and location of all facilities required for the interconnection.

Another concern is the potential for permanent damage to the soil resource in areas disturbed during construction. This is especially significant in lacustrine, or fine-grained lake plain soils, and in upland glacial-derived soils. Below are several considerations related to the protection of soil resources in agricultural fields.

1. Since the depth of the topsoil layer is generally quite shallow in New York, it is critical that the topsoil layer be protected in order to achieve maximum crop production. The Department requires stripping and stockpiling the topsoil from any areas disturbed by construction activities including access roads, tower sites and any other areas where excavation or other ground disturbance activities will occur. Following construction, the subsoil must be shattered or decompacted (see #2 below), and topsoil must be graded and restored to the original depth. It is important for the Project Applicant to negotiate adequate work space with the landowner to allow for the proper protection of the topsoil resource.

2. The Department has observed that projects of this nature have the potential to cause considerable compaction (overcompaction) to the topsoil and subsoil layers. If not properly mitigated, the compaction can significantly reduce crop production for a number of years. Because of this, the Department requires the Project Applicant to perform deep tillage in agricultural areas during restoration.

3. Many of the soil types in the areas where wind farms have been constructed in New York have shallow depth to bedrock and/or have a high concentration of rock in the subsoil. Extensive excavation in these soil types can result in a higher than normal concentration of rock in the upper subsoil and topsoil layers. If not properly removed, this rock concentration can create long-term difficulties for the farm operator.

4. Changes in the natural land surface and subsurface drainage patterns have also been observed at existing wind farms. These changes occur as a result of the construction of access roads, as well as from other excavation or ground disturbance activities. Drainage impacts need to be considered during the planning and construction phases of the proposed project and need to be properly mitigated during the restoration phase of the project.

5. The Project Description in the Application indicates a 36-inch burial depth for the underground portion of the electrical collector system. In accordance with the *Department's Guidelines*, burial depth in agricultural lands is 48-inches below grade. The same applies for foundation removal (decommissioning) in agricultural fields. This burial depth should be reflected in the DEIS. Burial depth within the soil profile is important from a farming standpoint due to the permanence of the cable's position in the soil profile. Inappropriate depth of the electrical collector system cable will diminish current and future farm operators' capacities to administer the scope of land-fitting practices required to meet specialized cropping needs. Such practices can range from deep tillage to the

installation of subsurface tile drain lines. Restoration in buried cable areas includes subsoil decompaction, rock picking (>4" dia. rocks uplifted through subsoil decompaction), topsoil replacement, application of soil amendments (lime & fertilizer) discing and seeding on the previously disturbed areas.

In addition to the design requirements set forth in §17 parts (a) through (f) of the Town Law, The Department strongly recommends that the Lead Agency require the Project Applicant to develop an Agricultural Resources Study and Mitigation Plan to be included in the DEIS.

I have enclosed a copy of the Department's ***Guidelines for Agricultural Mitigation for Windpower Projects*** for your information. Proper implementation of these guidelines will help to minimize impacts to agricultural resources. The Department strongly recommends that the Town Board consider requiring the Project Applicant to follow these guidelines as a condition of their special use permit. If you have any questions, please feel free to contact me.

Sincerely,



Michael Saviola
Agricultural Resource Specialist
Division of Agricultural Protection & Development
New York State Department of Agriculture & Markets
158 Main Street
Mt. Morris, N.Y. 14510-1595
t. 585.658.9854
f. 585.658.4707
c. 607.351.7954
e-mail: michael.saviola@agmkt.state.ny.us

Encl.

cc: Town of Villenova Town Board
Town of Hanover Town Board
Steve Tomasic, NYS Department of Environmental Conservation
Andrew Davis, NYS Department of Public Service
Matthew Brower, NYS Department of Agriculture & Markets
Dave Wilson, Chautauqua County Soil & Water Conservation District
Noble Ball Hill

**NEW YORK STATE**
**DEPARTMENT OF AGRICULTURE AND MARKETS**

**Guidelines for**
**Agricultural Mitigation for Wind Power Projects**

The following guidelines shall apply to construction areas for wind power construction projects impacting agricultural land. The project sponsor shall coordinate with the New York State Department of Agriculture and Markets (Ag. and Markets) to develop an appropriate schedule for inspections to assure that the goals of these guidelines are being met. The project sponsor shall hire an Environmental Monitor to oversee the construction and restoration in agricultural fields.

## Siting Goals

Minimize impacts to normal farming operations by locating structures along field edges and in nonagricultural areas where possible.

Avoid dividing larger fields into smaller fields, which are more difficult to farm, by locating access roads along the edge of agricultural fields (hedgerows and field boundaries) and in nonagricultural areas where possible.

Locate access roads, which cross agricultural fields, along ridge tops and following field contours, where possible, to eliminate the need for cut and fill and reduce the risk of creating drainage problems.

The permanent width of access roads in agricultural fields should be no more than 16 feet to minimize the loss of agricultural land.

All existing drainage and erosion control structures such as diversions, ditches, and tile lines shall be avoided or appropriate measures taken to maintain the design and effectiveness of the existing structures. Any structures disturbed during construction shall be repaired to as close to original condition as possible, as soon as possible, unless such structures are to be eliminated based on a new design.

## Construction Requirements

The surface of access roads constructed through agricultural fields shall be level with the adjacent field surface.

Culverts and waterbars shall be installed to maintain natural drainage patterns.

All topsoil must be stripped from agricultural areas used for vehicle and equipment traffic and parking. All vehicle and equipment traffic and parking shall be limited to the access road and/or designated work areas such as tower sites and laydown areas. No vehicles or

equipment will be allowed outside the work area without prior approval from the landowner and, when applicable, the Environmental Monitor.

The area of impact from the installation of electric cables can vary depending on the installation method and number of cables. When 3 or more cables are installed in the same area or if an open trench is required for installation, topsoil stripping from the entire work area will be necessary. As a result, additional work space may be required.

Topsoil stripped from work areas (tower sites, parking areas, electric cable trenches, along access roads) shall be stockpiled separate from other excavated material (rock and/or subsoil). At least 50 feet of temporary workspace is needed along "open-cut" electric cable trenches for proper topsoil segregation. All topsoil will be stockpiled immediately adjacent to the area where stripped/removed and shall be used for restoration on that particular site. Topsoil stockpile areas shall be clearly designated in the field and on the on-site "working set" of construction drawings.

Electric interconnect cables and transmission lines installed above ground can create long term interference with agricultural land use. As a result, interconnect cables shall be buried in agricultural fields wherever practicable. Interconnect cables and transmission lines installed above ground should be located outside field boundaries wherever possible. When above ground cables and transmission lines must cross farmland, the project sponsor shall minimize agricultural impacts by using taller structures that provide longer spanning distances and shall locate poles on field edges to the greatest extent practicable. The line location and pole placements shall be reviewed with the Department and the Environmental Monitor prior to final design.

In cropland, hayland and improved pasture a minimum depth of forty-eight inches of cover will be required for all buried electric cables. In unimproved grazing areas and land permanently devoted to pasture, a minimum depth of thirty-six inches of cover will be required. In areas where the depth of soil over bedrock ranges from zero to forty-eight inches, the electric cables shall be buried entirely below the top of the bedrock or at the depth specified for the particular land use whichever is less. At no time will the depth of cover be less than twenty-four inches below the soil surface.

All excess subsoil and rock shall be removed from the site. On site disposal of such material may be allowed if approved by the landowner and the Environmental Monitor, with appropriate consideration given to any possible agricultural or environmental impacts.*

In pasture areas, work areas will be fenced to prevent livestock access, consistent with landowner agreements.

All pieces of wire, bolts, and other unused metal objects will be picked up and properly disposed of as soon as practical after the unloading and packing of turbine components so that these objects will not be mixed with any topsoil.*

Excess concrete will not be buried or left on the surface in active agricultural areas. Concrete trucks will be washed outside of active agricultural areas.*

(*Any permits necessary for disposal under local, State and/or federal laws and regulations must be obtained by the contractor, with the cooperation of the landowner when required.)

**Restoration Requirements**

Following construction, all disturbed agricultural areas will be decompacted to a depth of 18 inches with a deep ripper or heavy-duty chisel plow. In areas where the topsoil was stripped, soil decompaction shall be conducted prior to topsoil replacement. Following decompaction, all rocks 4 inches and larger in size will be removed from the surface of the subsoil prior to replacement of the topsoil. The topsoil will be replaced to original depth and the original contours will be reestablished where possible. All rocks 4 inches and larger shall be removed from the surface of the topsoil. Subsoil decompaction and topsoil replacement should be avoided after October 1, unless approved on a site-specific basis by the landowner in consultation with Ag. and Markets. All parties involved should be cognizant that areas restored after October 1st may not obtain sufficient growth to prevent erosion over the winter months. If areas are to be restored after October 1st, necessary provision should be made to restore any eroded areas in the springtime, to establish proper growth.

All access roads will be regraded to allow for farm equipment crossing and to restore original surface drainage patterns, or other drainage pattern incorporated into the design.

All restored agricultural areas shall be seeded with the seed mix specified by the landowner, in order to maintain consistency with the surrounding areas.

All surface or subsurface drainage structures damaged during construction shall be repaired to as close to preconstruction conditions as possible, unless said structures are to be removed as part of the project design. Any surface or subsurface drainage problems resulting from construction of the wind energy project will be corrected with the appropriate mitigation as determined by the Environmental Monitor, The Department and the Landowner.

Following restoration, all construction debris will be removed from the site.

**Two Year Monitoring and Remediation**

The Project Sponsor will provide a monitoring and remediation period of no less than two years immediately following the completion of initial restoration. The two year period allows for the effects of climatic cycles such as frost action, precipitation and growing seasons to occur, from which various monitoring determinations can be made. The monitoring and remediation phase will be used to identify any remaining agricultural

impacts associated with construction that are in need of mitigation and to implement the follow-up restoration.

General conditions to be monitored include topsoil thickness, relative content of rock and large stones, trench settling, crop production, drainage and repair of severed fences, etc. Impacts will be identified by the Environmental Monitor through on site monitoring of all agricultural areas impacted by construction and through contact with respective farmland operators and the Department of Agriculture and Markets.

Topsoil deficiency and trench settling shall be mitigated with imported topsoil that is consistent with the quality of topsoil on the affected site. Excessive amounts of rock and oversized stone material will be determined by a visual inspection of disturbed areas as compared to portions of the same field located outside the construction area. All excess rocks and large stones will be removed and disposed of by the Project Sponsor.

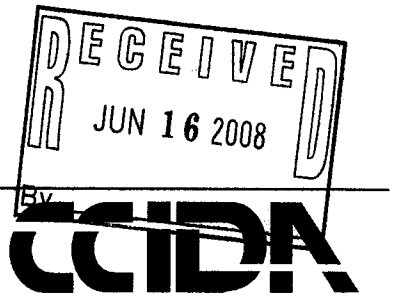
When the subsequent crop productivity within affected areas is less than that of the adjacent unaffected agricultural land, the Project Sponsor as well as other appropriate parties, will help to determine the appropriate rehabilitation measures to be implemented. Because conditions which require remediation may not be noticeable at or shortly after the completion of construction, the signing of a release form prior to the end of the remediation period will not obviate the Project Sponsor's responsibility to fully redress all project impacts.

Subsoil compaction shall be tested using an appropriate soil penetrometer or other soil compaction measuring device. Compaction tests will be made for each soil type identified on the affected agricultural fields. The subsoil compaction test results within the affected area will be compared with those of the adjacent unaffected portion of the farm field/soil unit. Where representative subsoil density of the affected area exceeds the representative subsoil density of the unaffected areas, additional shattering of the soil profile will be performed using the appropriate equipment. Deep shattering will be applied during periods of relatively low soil moisture to ensure the desired mitigation and to prevent additional subsoil compaction. Oversized stone/rock material which is uplifted to the surface as a result of the deep shattering will be removed.

Revised 4-8-08

County of
Chautauqua

Industrial
Development
Agency




June 12, 2008

Daniel A Spitzer
Hodgson Russ LLP
140 Pearl Street, Suite 100
Buffalo, NY 14202-4040

Dear Mr. Spitzer:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intent to be Lead Agency

Enclosed is the signed copy of the Notice of Intent to be Lead Agency for the Town of Villenova Town Board.

Best Regards,

William J. Daly
Administrative Director/CEO

Enclosure

200 Harrison Street, Jamestown, NY 14701-6902
716-664-3262 / 716-664-4515 FAX
ccida@ccida.com

William J. Daly
Administrative Director/CEO
dalyw@ccida.com

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County Planning Board
200 Harrison Street
Jamestown, NY 14701
***Attention: George Holt***

Dear Mr. Holt:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

The purpose of this letter is to notify you of the Villenova Town Board's intent to act as lead agency and request that you consent to its doing so by signing the attached Notice of Intent and returning it to me as soon as possible.

Please note the Town previously enacted a comprehensive Local Law to regulate the placement of wind energy conversion systems, establishing minimum setbacks and maximum height and noise levels and creating a review process which requires in-depth analysis of the project's potential impacts, including noise studies, wetlands delineation and mitigation, aesthetic/visual assessment, impacts on farm lands, drainage issue and traffic impacts. In addition to special counsel, the town will hire independent consultants to assist in its environmental review.

Further, Noble has consented to the preparation of a Draft Environmental Impact Statement ("DEIS"). We are therefore providing you with a copy of the application (which contains an outline for the DEIS), Part I of the FEAF, and other supporting documentation for your review and comment.

Very truly yours,

Daniel A. Spitzer

DAS/klp
Enclosure

**STATE ENVIRONMENTAL QUALITY REVIEW ACT**
**NOTICE OF INTENT TO ACT AS SEQRA LEAD AGENCY**

Dated: May 20, 2008

This notice is issued pursuant to 6 NYCRR Part 617 of the regulations, implementing Article 8 of the Environmental Conservation Law, together known as the State Environmental Quality Review Act ("SEQRA").

The Town Board of the Town of Villenova (the "Town Board") has determined that the action described below is subject to SEQRA and may involve one or more other involved or interested agencies. The Town Board has made a preliminary determination that this is a Type I action in accordance with 6 NYCRR §617.6(a)(1)(iv), requiring coordinated review. The Town Board has stated its intent to act as lead agency. In the absence of written objections from any other involved agencies within thirty (30) days from the date of this notice, the Town Board will assume the lead agency role for this action pursuant to 6 NYCRR §617.6(b)(3)(i).

The applications, plans and full Environmental Assessment Form are attached for your information. The project sponsor has also indicated that it will prepare a Draft Environmental Impact Statement ("DEIS") to examine all significant adverse environmental impacts.

**Name of Action: Noble Ball Hill Windpark, LLC**

**SEQR Status:** Type I

**Description of Action:** The Project is located in the Towns of Villenova and Hanover, Chautauqua County, New York at various locations, and proposes the construction, operation and wind energy facility and associated infrastructure including but not limited to access roads, collection and transmission lines, and substation(s). The Project proposes construction of 63 turbines of 1.5 MW each (52 of which will be located in Villenova and 11 in Hanover) over an area of 5,616 acres.

**Other Interested and/or Involved Agencies:**

1. New York State Department of Environmental Conservation
2. New York State Office of Parks, Recreation and Historic Preservation
3. New York State Department of Transportation - Region Five
4. New York State Department of Public Service – PSC
5. United States Department of the Interior

6. U.S. Army Corps of Engineers

7. Federal Aviation Administration

8. Town of Hanover Zoning Board of Appeals

9. Town of Villenova Highway Department

10. Chautauqua County Highway Department

11. Chautauqua County Planning Department

12. Chautauqua County IDA

13. New York State Department of Agriculture and Markets

14. Town of Hanover Town Board

15. Town of Hanover Highway Department

**For Further Information:**

Contact Person: Daniel A. Spitzer, Esq.
Hodgson Russ, LLP
Address: 140 Pearl Street, Suite 100
Buffalo, New York 14202

**Date of Mailing:** May 21, 2008



County of
Chautauqua

Industrial
Development
Agency




June 11, 2008

Daniel A Spitzer
Hodgson Russ LLP
140 Pearl Street, Suite 100
Buffalo, NY 14202-4040

Dear Mr. Spitzer:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intent to be Lead Agency

Enclosed is the signed copy of the Notice of Intent to be Lead Agency for the Town of Villenova Town Board.

Best Regards,

William J. Daly
Administrative Director/CEO

Enclosure

200 Harrison Street, Jamestown, NY 14701-6902
716-664-3262 / 716-664-4515 FAX
ccida@ccida.com

William J. Daly
Administrative Director/CEO
dalyw@ccida.com

**Daniel A. Spitzer**
Partner
Direct Dial: 716.848.1420
Direct Facsimile: 716.819.4650
*dspitzer@hodgsonruss.com*

Hodgson Russ LLP
ATTORNEYS

May 21, 2008

Chautauqua County IDA
200 Harrison Street
Jamestown, New York 14701
***Attention: William Daly, Director***

Dear Mr. Daly:

Re: Noble Ball Hill Windpark
Town of Villenova Town Board
Notice of Intend to be Lead Agency

I am special counsel to the Town of Villenova in Chautauqua County, New York. Noble Ball Hill Windpark, LLC has submitted an application to the town to construct and operate a total of 63 wind energy conversion systems (52 in the Town of Villenova and 11 in the Town of Hanover). The Villenova Town Board has determined that the Project is a Type I action requiring coordinated review. Your agency has been identified as a potentially involved/interested agency for this application.

The purpose of this letter is to notify you of the Villenova Town Board's intent to act as lead agency and request that you consent to its doing so by signing the attached Notice of Intent and returning it to me as soon as possible.

Please note the Town previously enacted a comprehensive Local Law to regulate the placement of wind energy conversion systems, establishing minimum setbacks and maximum height and noise levels and creating a review process which requires in-depth analysis of the project's potential impacts, including noise studies, wetlands delineation and mitigation, aesthetic/visual assessment, impacts on farm lands, drainage issue and traffic impacts. In addition to special counsel, the town will hire independent consultants to assist in its environmental review.

Further, Noble has consented to the preparation of a Draft Environmental Impact Statement ("DEIS"). We are therefore providing you with a copy of the application (which contains an outline for the DEIS), Part I of the FEAF, and other supporting documentation for your review and comment.

Very truly yours,

Daniel A. Spitzer

DAS/klp
Enclosure

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**NOTICE OF INTENT TO ACT AS SEQRA LEAD AGENCY**

Dated: May 20, 2008

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The applications, plans and full Environmental Assessment Form are attached for your information. The project sponsor has also indicated that it will prepare a Draft Environmental Impact Statement ("DEIS") to examine all significant adverse environmental impacts.

**Name of Action: Noble Ball Hill Windpark, LLC**

**SEQR Status:** Type I

**Description of Action:** The Project is located in the Towns of Villenova and Hanover, Chautauqua County, New York at various locations, and proposes the construction, operation and wind energy facility and associated infrastructure including but not limited to access roads, collection and transmission lines, and substation(s). The Project proposes construction of 63 turbines of 1.5 MW each (52 of which will be located in Villenova and 11 in Hanover) over an area of 5,616 acres.

**Other Interested and/or Involved Agencies:**

1. New York State Department of Environmental Conservation
2. New York State Office of Parks, Recreation and Historic Preservation
3. New York State Department of Transportation - Region Five
4. New York State Department of Public Service – PSC
5. United States Department of the Interior

6. U.S. Army Corps of Engineers

7. Federal Aviation Administration

8. Town of Hanover Zoning Board of Appeals

9. Town of Villenova Highway Department

10. Chautauqua County Highway Department

11. Chautauqua County Planning Department

12. Chautauqua County IDA

13. New York State Department of Agriculture and Markets

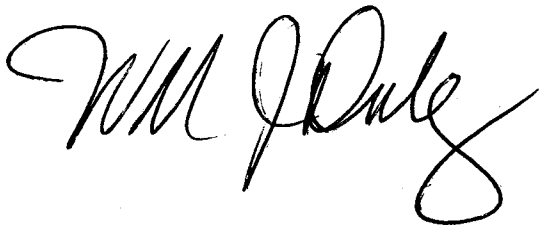
14. Town of Hanover Town Board

15. Town of Hanover Highway Department

**For Further Information:**

Contact Person: Daniel A. Spitzer, Esq.
Hodgson Russ, LLP
Address: 140 Pearl Street, Suite 100
Buffalo, New York 14202

**Date of Mailing:** May 21, 2008



RECEIVED
JUN 07 2008
BY

CHAUTAUQUA COUNTY DEPARTMENT OF PUBLIC FACILITIES

GREGORY J. EDWARDS
*County Executive*

George P. Spanos
*Director of Public Facilities*

June 5, 2008

Mr. Daniel A. Spitzer
Hodgson Russ
The Guaranty Building
140 Pearl Street
Suite 100
Buffalo, NY 14202-4040

Dear Mr. Spitzer:

The Chautauqua County Department of Public Facilities (CCDPF) concurs with the Town of Villenova being lead agent on the SEQR for the proposed Noble Ball Hill Windpark.

Please keep us on your mailing list as the project develops; particularly as it relates to requested use of County roads.

Thank you.

George P. Spanos, PE
Director, CCDPF

GPS/car

Cc: Yvonne Park, Supervisor, Town of Villenova
Jerry Park, Legislator, District 5

454 NORTH WORK STREET, FALCONER, NEW YORK 14733, (716) 661-8400, FAX (716) 661-8451

## Resolution of Acceptance of Lead Agency

**RESOLUTION DECLARING VILLENOVA TOWN BOARD'S INTENT TO ACT AS LEAD AGENCY AND AUTHORIZING ESCROW AGREEMENT**

RESOLUTION, dated May 20, 2008, by Donald Chase, seconded by Melvin Conklin.

**WHEREAS**, Noble Ball Hill Windpark, LLC ("Noble") has proposed to construct, operate and maintain a 94.5 MW Wind Energy Facility consisting of sixty-three (63) 1.5 MW wind turbines (52 of which are located in the Town of Villenova and 11 of which are located in the Town of Hanover), associated infrastructure including access roads, collection and transmission lines and substations (the "Project"); and

**WHEREAS**, Noble submitted an application for a Special Use Permit pursuant to Local Law No. 1 of 2007 entitled "Wind Energy Facilities Law of the Town of Villenova" ("Wind Law") together with a full Environmental Assessment Form ("FEAF"), prepared by Ecology and Environment, Inc., and other materials required by the Wind Energy Facilities Law for the portion of the project located in the Town of Villenova; and

**WHEREAS**, the Town of Villenova Town Board (the "Town Board") must comply with the State Environmental Quality Review Act, ECL Article 8 and its implementing regulations at 6 NYCRR Part 617 (collectively, "SEQRA"); and

**WHEREAS**, the Town Board desires to be assume Lead Agency status to allow it to conduct a coordinated environmental review of the Project; and

**WHEREAS,** the Wind Law authorizes the Town Board to require an escrow agreement for engineering and legal review of applications under the Wind Law and SEQRA review of such applications; and

**WHEREAS,** counsel for the Town and Noble have negotiated and prepared an escrow agreement (the "Escrow Agreement") for the Project.

**NOW, THEREFORE, BE IT RESOLVED,**

1. the Project will require SEQRA review;
2. That the proposed action is a Type I action;
3. The following agencies are involved or interested agencies:
    a. NYS Dept. of Environmental Conservation ("NYSDEC");

b. NYS Dept. of Transportation – Region 5 ("NYSDOT");

c. NYS Dept. of Public Service - ("NYSPSC");

d. NYS Office of Parks, Recreation and Historic Preservation

e. NYS Dept. of Agriculture and Markets

f. U.S. Dept. of Interior Fish and Wildlife Service

g. U.S. Army Corps of Engineers

h. Federal Aviation Administration

i. Town of Villenova Highway Department

j. Town of Hanover Town Board

k. Town of Hanover Zoning Board of Appeals

l. Town of Hanover Highway Department

m. Chautauqua County IDA

n. Chautauqua County Planning Board

o. Chautauqua County Highway Department

4. that the Town Board hereby states its intent to be Lead Agency for the Project pursuant to SEQRA regulations 6 NYCRR Part 617; and

5. that the Town Board hereby authorizes and directs the Town Clerk to circulate a Lead Agency Coordination Letter together with the FEAF, a location map, plans, application forms and such other information as has been prepared and submitted to date by Noble to all SEQRA involved agencies and request their consent or objections within thirty (30) days.

6. that the Town Board hereby authorizes and directs the Town Clerk to forward the Application, FEAF and other materials submitted by Noble to the Town's consultant for review under Local Law No. 1 of 2007.

7. that the Town Board hereby approves the Escrow Agreement and authorizes the Supervisor to execute the same.

| ROLL CALL | | Yes | No | Abstain |
|---|---|---|---|---|
| Supervisor | YM Park | X | | |
| Councilmember | D Chase | X | | |
| Councilmember | M Conklin | X | | |
| Councilmember | S Ecker Newton | X | | |
| Councilmember | J Howard Rose | X | | |

DATED: May 20, 2008

STATE OF NEW YORK )
COUNTY OF Chautauqua ) ss.:
TOWN OF Villenova )

(SEAL)

Town Board Resolution - Certificate Form No. 337 WILLIAMSON LAW BOOK CO. VICTOR, NY

I, Julie Goodway, Town Clerk of the Town of Villenova, Chautauqua County, New York, DO HEREBY CERTIFY, that I have compared the foregoing with the original resolution adopted by the Town Board of the Town of Villenova at a meeting of said Board held on the 20th day of May, 20 08, and that the foregoing is a true and correct transcript of said original resolution and of the whole thereof, and that said original resolution is on file in my office.

I DO FURTHER CERTIFY, that each of the members of said Town Board had due notice of said meeting, and that Yvonne M. Park, Supervisor, and Donald Chase, Melvin Conklin, Sue E.Newton, and Judith H. Rose, Councilmen/~~Town Justices~~, were present at such meeting, & (Name):_____(Title):_____was absent.

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of the Town of Villenova, this 02 day of June, 20 08

Julie Goodway
Town Clerk

## Resolution Declaring Lead Agency

**STATE ENVIRONMENTAL QUALITY REVIEW ACT**
**RESOLUTION OF THE**
**TOWN OF VILLENOVA REGARDING THE PROPOSED**
**NOBLE BALL HILL WINDPARK, LLC**

WHEREAS, the NOBLE BALL HILL WINDPARK, LLC ("Noble Ball Hill") proposes to undertake the development of wind energy facilities in the Town of Villenova and Town of Hanover including the construction of 63 turbines of 1.5 MW each (52 of which will be located in Villenova and 11 in Hanover), access roads, collection and transmission lines and utility infrastructure (the "Project"); and

WHEREAS, certain elements of the Project exceed Type I thresholds specified in Section 617.4 of the State Environmental Quality Review Act ("SEQRA") regulations (6 NYCRR Part 617), and the Town has undertaken a coordinated review of the Project by distributing a Full Environmental Assessment Form and other relevant information to other agencies identified as being potentially involved (having an approval regarding the Project) or interested; and

WHEREAS, the Town has indicated its intent to act as the Lead Agency for the SEQRA review of the Project through a Notice of Intent to Act as Lead Agency, and the other potentially involved or interested agencies have either agreed that the Town should act as Lead Agency for the SEQR review of this Project, or did not reply within the 30-day period allotted by the SEQRA regulations to coordinate Lead Agency status; and

WHEREAS, the Town has reviewed the EAF and the criteria set forth in SEQRA in order to determine whether the Project under consideration may have a potentially significant adverse impact on the environment.

NOW THEREFORE, based on such review and consideration, the Town Board of the Town hereby resolves that the Town is the Lead Agency for purposes of the SEQRA review of the Project, and as the Lead Agency, further resolves that the proposed Project potentially will have a significant adverse impact on the environment for the reasons more particularly set forth in the Positive Declaration attached hereto and made a part hereof, and, in accordance with SEQRA, the Board hereby adopts such Positive Declaration with regard to the proposed Project and orders the Applicant to prepare a Draft Environmental Impact Statement.

ADOPTED: June 23, 2008

## Positive Declaration

State Environmental Quality Review
**POSITIVE DECLARATION**
Notice of Intent to Prepare a Draft EIS
Determination of Significance

**Town of Villenova, Chautauqua County** **June 23, 2008**

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law. The Town of ~~Arkwright~~ Villenova, as lead agency, has determined that the proposed action described below may have a significant impact on the environment and that a Draft Environmental Impact Statement will be prepared.

**Name of Action:** Noble Ball Hill Windpark LLC

**SEQR Status:** Type I

**Description of Action:** The proposed action involves the construction of multiple wind energy generating turbines, plus related utility infrastructure, substation, and access roads in the Town of Villenova and the Town of Hanover (the "Project").

**Location:** Portions of the Towns of Villenova and Hanover, Chautauqua County, New York.

**Reasons Supporting this Determination:** Potential environmental impacts associated with the proposed action were identified in the Full Environmental Assessment Form. These impacts, which may be reasonably expected to result from the Project, have been compared to the criteria for determining significance identified in 6 NYCRR § 617.7(c)(1) and in accordance with 6 NYCRR § 617.7(c)(2) and (3). As indicated below in the discussion of each criterion specified in 6 NYCRR § 617.7(c)(1), the Project may result in one or more significant impacts on the

environment, and an Environmental Impact Statement ("EIS") will be prepared to address those potential impacts.

**(i) a substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels; a substantial increase in solid waste production; a substantial increase in potential for erosion, flooding, leaching or drainage problems;**

**Ground and Surface Water Quality or Quantity, Erosion, Flooding, Leaching, Drainage:** There are wetlands, surface water and ground water resources throughout the Project area that may be impacted. The United States Army Corps of Engineers and the new York State Department of Environmental Conservation will be consulted to confirm the presence of such state and federal wetlands if they might be impacted. Wetlands will be avoided if possible, but if impacts will occur, the Corps and the DEC will be consulted to determine if a permit and mitigation are warranted. Erosion and drainage concerns are raised by the potential access roads and tower construction. Impervious surfaces from the Project will increase storm water run-off. A storm water discharge permit for construction activities will be required, and a related storm water pollution prevention plan will be prepared and implemented to manage storm water.

**Traffic:** There will be significant truck traffic during construction. Erosion and drainage concerns are raised by the potential access roads and tower construction.

**Air Quality:** A substantial adverse change in air quality is not anticipated as a result of the Project. Dust control measures will be employed during construction, if needed.

**Noise:** An increase in ambient noise levels will occur during construction and upon the development of the wind towers, which impacts may be significant.

**(ii) the removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse impacts on a threatened or endangered species of animal or plant, or the habitat of such a species; or other significant adverse impacts to natural resources;**

The project area consists of farmland and other open space area. Potential impacts include the loss of significant habitat area and farmland, potential impacts on threatened or endangered species of animals or plants or the habitat of such a species.

**(iii) the impairment of the environmental characteristics of a Critical Environmental Area as designated pursuant to subdivision 617.14(g) of this Part;**

The Project site is not within or adjacent to a *Critical Environmental Area* as designated pursuant to 6 NYCRR § 617.14(g) and thus will not impair the environmental characteristics of a *Critical Environmental Area.*

**(iv) the creation of a material conflict with a community's current plans or goals as officially approved or adopted;**

No impact anticipated.

**(v) the impairment of the character or quality of important historical, archeological, architectural, or aesthetic resources or of existing community or neighborhood character;**

**Historic, Archaeological, Architectural, and Aesthetic Resources:** The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) will be consulted. There is a potential for significant visual impacts, including, but not limited to shadow flicker impacts.

**Community Character:** The Project has the potential for significant impact on the community character.

**(vi) a major change in the use of either the quantity or type of energy;**

The purpose of the Project is to create energy-producing wind towers.

**(vii) the creation of a hazard to human health;**

The Project is not anticipated to pose a hazard to human health.

**(viii) a substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses;**

The Project will significantly change the use, or intensity of use, of land including agricultural, open space or recreational resources, and its capacity to support existing uses. The Project is in a New York State certified Agricultural District.

**(ix) the encouraging or attracting of a large number of people to a place or places for more than a few days, compared to the number of people who would come to such place absent the action;**

The Project will not encourage or attract a large number of people to a place or places for more than a few days, compared to the number of people who would come to such place absent the action.

**(x) the creation of a material demand for other actions that would result in one of the above consequences;**

It is not anticipated that the Project will create the material demand for any other actions that would result in one of the above consequences.

**(xi) changes in two or more elements of the environment, no one of which has a significant impact on the environment, but when considered together result in a substantial adverse impact on the environment; or**

The Project's potentially adverse impacts to the environment will be addressed in the Environmental Impact Statement.

**(xii) two or more related actions undertaken, funded or approved by an agency, none of which has or would have a significant impact on the environment, but when considered cumulatively would meet one or more of the criteria in this subdivision.**

The cumulative impacts of the Project will be addressed in the Environmental Impact Statement.

For Further Information:

| | |
|---|---|
| Contact Person: | Yvonne Park, Supervisor |
| Address: | Town of Villenova Town Hall<br>1094 Butcher Road, South Dayton, New York 14138 |
| Telephone Number: | (716) 988-3476 |

A copy of this notice must be sent to:

Department of Environmental Conservation, 625 Broadway, Albany, NY 12233-1750
Chief Executive Officer, Town of Villenova
Chief Executive Officer, Town of Hanover
Any person requesting a copy
All involved agencies
Environmental Notice Bulletin, 625 Broadway, Albany, NY 12233

# E Stormwater Pollution Measures

# STORMWATER POLLUTION PREVENTION MEASURES

NOBLE BALL HILL WINDPARK, LLC

Towns of Villenova and Hanover
Chautauqua County, New York

Noble Environmental Power, LLC
7294 Centerville Road
Bliss, New York 14024

July 2008

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## 1.0 INTRODUCTION

Prior to construction of the Ball Hill Windpark, Noble will prepare a Stormwater Pollution Prevention Plan (SWPPP). The purpose of this plan is to document the means and methods for controlling runoff and pollutants from the Project Site during and after construction activities. The principal objective of a SWPPP is to comply with the State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities by planning and implementing the following practices:

- Reduction or elimination of erosion and sediment loading to waterbodies during construction;
- Control of the impact of stormwater runoff on the water quality of the receiving waters;
- Control of the increased volume and peak rate of runoff during and after construction; and
- Maintenance of stormwater controls during and after construction.

The SWPPP will be prepared in accordance with the following guidance documents:

- *New York State Standards and Specifications for Erosion and Sediment Control*, New York State Department of Environmental Conservation, August 2005;
- *New York State Stormwater Management Design Manual*, New York State Department of Environmental Conservation, August 2003; and
- *SPDES General Permit for Stormwater Discharges from Construction Activities*, New York State Department of Environmental Conservation, May 2008.

This document provides a description of the methods that may be employed to control stormwater and minimize erosion within the Project. The final SWPPP prepared for the Project will identify what measures will be used and the specific areas where they will be employed.

## 1.1 General Project Description

A maximum 300 by 300-foot area at each turbine site (60 total) will be disturbed to construct the wind turbines and monopole structures, including a foundation for the monopole structure and the surrounding construction/maintenance area. In preparation for the installation of each turbine, a gravel crane pad approximately 120 feet by 40 feet will be constructed within the 300-foot by 300-foot disturbance area with a slope of 1% or less in each direction. Upon completion of the wind turbine, the gravel crane pad may remain in place for future maintenance.

Additional facilities at the Project Site include approximately 16 miles of access roads, approximately 24 miles of electric collection lines, 6 miles of transmission line, a substation, a switchyard, 28 acres of temporary staging and an operations and maintenance building. Stormwater runoff from the proposed access roads will sheet flow or be collected through open road-side channels where it is conveyed to the respective outfalls.

# 2.0 EROSION CONTROL MEASURES

## 2.1 General

Structural erosion and sediment control measures are classified as either temporary or permanent, according to how they are used. Temporary structural measures shall be used during construction to prevent off-site sedimentation. Permanent structural measures shall be utilized following construction and shall be implemented to convey surface water safely to the existing drainageways present in the pre-development condition. The permanent structural measures shall remain in-place and continue to function and will be maintained after the completion of construction. General construction notes and the maintenance plan for implementing the temporary and permanent stormwater and erosion control structures during and after construction have been developed for the site.

Erosion control measures shall be inspected weekly and after heavy rains by a qualified inspector experienced in erosion and sedimentation control techniques until the site reaches final stabilization in accordance with the SPDES permit. Inspections of erosion control structures are described under Section 4.0, Site Assessment and Inspection, and shall be in accordance with *SPDES General Permit for Stormwater Discharges from Construction Activities*. Noble will file a Notice of Intent (NOI) Form with the New York State Department of Environmental Conservation (NYSDEC) prior to commencement of construction activities.

## 2.2 Temporary Structural Measures

This subsection describes the specific temporary control measures to be implemented to reduce and/or eliminate erosion and sedimentation during the construction phase of this project. All measures will be designed in accordance with the *New York State Standards and Specifications for Erosion and Sediment Control*.

### 2.2.1 Straw Bale Dike

A temporary barrier of straw or similar material shall be used to intercept sediment-laden runoff at various disturbed site areas. The purpose of the straw bale dikes is to reduce runoff velocity and to encourage deposition of any transported sediment created during construction. Straw bale dikes have an estimated design life of three months.

### 2.2.2 Turbidity Curtain

A temporary flexible, impenetrable barrier shall be used to trap sediment in waterbodies. The curtain shall be weighted at the bottom to achieve closure while supported at the top through a flotation system. A turbidity curtain is generally used when construction activity occurs within a waterbody or along its shoreline, generally less than one month duration. Curtains shall not be used across flowing watercourses.

### 2.2.3 Temporary Access Waterway Crossing

A temporary access waterway crossing is a structure placed across a waterway to provide access for construction purposes for a period of less than a year. Temporary access waterway crossings are necessary to prevent construction equipment from damaging the waterway, blocking fish migration, and tracking sediment and other pollutants into the waterway.

### 2.2.4 Silt Fence

A temporary barrier of geotextile fabric (filter cloth) shall be used to intercept sediment-laden runoff along the borders of disturbed site areas during construction. The geotextile filter fabric fence

requires periodic maintenance and should be checked for tears or clogging with silt or debris. Silt can be removed from the woven filter cloth with a stiff brush if clogging occurs.

### 2.2.5 Stabilized Construction Entrance

A stabilized pad of aggregate underlain with filter cloth shall be positioned at points where traffic will enter or leave the construction site area onto public roads. This measure will reduce the tracking of soils onto public roads or streets.

### 2.2.6 Stone Outlet Sediment Trap

Temporary stone outlet sediment traps shall be utilized during construction to intercept sediment-laden runoff from disturbed areas and from dewatering of turbine foundations. The sediment traps will retain the runoff and allow sediment to settle prior to discharge. Temporary sediment traps shall be installed in the areas of construction prior to any earth disturbance. The sediment traps will be placed in temporary surface drainageways prior to run-off leaving the site, and will consist of over excavating around selected drainage structures. For dewatering practices, the sediment traps shall be placed adjacent to the turbine foundations, with the outlet discharging to a swale or ditch. Sediment traps will be limited to maximum drainage areas of 5 acres and provide sediment storage volume of 3,600 cubic feet (cf) for each acre of drainage area.

### 2.2.7 Stone Check Dams

Stone check dams shall be placed within the drainage channel sections at a distance of approximately 100 feet apart. These check dams shall consist of riprap stone comprised of fieldstone or rough quarry stone. The stone shall be composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The larger stones shall have a maximum diameter of 9 inches and a minimum diameter of 4 inches. The stone shall be hard and angular, and of a quality that will not disintegrate on exposure to water or to weathering. The maintenance needs of these structures are very low.

## 2.3 Permanent Structural Measures

### 2.3.1 Stone Erosion Protection Apron

Stone erosion protection aprons shall be placed at the inlet and outlet of culvert pipes for the purpose of reducing the depth, velocity, and energy of water movement. Materials used for construction of the stone erosion protection aprons consist of riprap stone comprised of fieldstone or rough quarry stone. The stone shall be composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The larger stones shall have a maximum diameter of 9 inches and a minimum diameter of 4 inches. The minimum thickness of the apron shall be 18 inches. The stone shall be hard and angular, and of a quality that will not disintegrate on exposure to water or weathering. The maintenance needs of these structures are very low. They should be inspected after high flows to see if scour beneath the rock protection has occurred, or if any stones have been dislodged.

### 2.3.2 Grassed Waterway

A grassed waterway is a natural or man-made channel that is below adjacent ground level and is stabilized by suitable vegetation to convey runoff without causing damage by erosion.

### 2.3.3 Lined Waterway

Drainage channels with a lining of stone to provide for the disposal of concentrated runoff without damage from erosion or flooding where grassed waterways would be inadequate due to high velocities.

### 2.3.4 Dry Swale

Dry swales are vegetated open channel systems that are designed to capture and treat stormwater within dry cells formed by check dams or other means. Each dry swale will include a permeable soil layer and a 4-inch underdrain to enhance water quality treatment. The channels are trapezoidal in shape with a minimum bottom width of 2 to 4 feet and a maximum side slope of 1:2 (v:h).

## 2.4 Maintenance of Temporary and Permanent Control Structures

### 2.4.1 Temporary and Permanent Stormwater Facilities during Construction

Temporary stormwater and erosion control structures must be constructed in accordance with their design intent and maintained to prevent sediment-laden runoff from leaving the site during construction. In general, the temporary structures during construction should be inspected by a qualified inspector at least every seven calendar-days, twice every seven days when more than 5 acres is disturbed at any given time, and after precipitation events in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, and maintained as follows:

- Stabilized construction entrance shall be inspected periodically and after each rainfall and the entrance shall be cleaned, repaired, or replaced, as required. The temporary construction entrance shall be removed when construction is completed and all disturbed areas are stabilized;

- Temporary sediment traps shall be installed prior to earth disturbance. Sediment traps shall be inspected weekly and after every rainfall, and the traps cleaned and restored to their original size when sediment has accumulated to one-half of the basin depth. Temporary sediment traps shall be removed and the area stabilized when their contributory drainage area is stabilized;

- Temporary silt fences, stone check dams, and sediment interceptors shall be installed prior to earth disturbance to reduce runoff velocity and transportation of sediment. The stabilization structures shall be inspected weekly and after every rainfall and the structures shall be cleaned, repaired, or replaced as required. Temporary stabilization structures shall be removed when their contributory drainage area is stabilized;

- Temporary grass-lined swales and channels shall be installed to divert runoff to sediment traps. The channels shall be inspected weekly and after each rainfall to ensure their stability and to locate points of scour, rodent-holes, breaches, and deposition of sediment or other obstructions. The channels shall be cleaned, repaired, and re-seeded, as required. Temporary channels shall be removed and the area stabilized when their contributory drainage area is stabilized;

- Temporary channel protection consisting of stone check dams at a maximum of 100-foot intervals along the channel invert shall be provided to prevent sediment-laden runoff from entering downstream drainage facilities. The stone check dams shall be inspected weekly and after every rainfall and the structures shall be cleaned, repaired, or replaced, as required. The stone check dams shall be removed when all disturbed areas are stabilized;

- All permanent drainage structures, installed as part of the site improvements, shall be inspected weekly and after every rainfall to ensure structural integrity and to detect vandalism and damage, and for cleaning. Permanent drainage structures shall be repaired or replaced, as required; and

- Upon final grading of topsoil, all disturbed soil areas shall be seeded and mulched. All seeded areas shall be inspected monthly and after every rainfall and the areas repaired and re-seeded, as required.

### 2.4.2 Permanent Stormwater Facilities after Construction

Permanent stormwater control structures must be constructed in accordance with their design intent and maintained on a routine basis to remain effective. In general, the structures after construction should be inspected periodically and maintained as follows:

- Permanent stormwater drainage facilities (i.e., culverts, channels, and dry swales) shall be inspected semiannually and after every heavy rainfall to ensure structural integrity and to detect vandalism and damage, and for cleaning. The facilities shall be repaired or replaced, as required;

- Stone erosion protection aprons shall be inspected semiannually and after every heavy rainfall to ensure structural integrity and that the stone has not been bypassed nor developed excessive scour at the stone base, or that sediment has built up. Sediment accumulated within the riprap stone erosion protection shall be removed, or stone replaced, as required, to allow runoff to drain through the stone to reduce erosive velocities and prevent large flows from carrying sediment over their tops; and

- Permanent lawns and landscaped areas shall be inspected and maintained on a regular basis, consistent with favorable plant growth, soil, and climatic conditions to ensure soil protection and structural integrity of the site's plant cover. Maintenance involves regular seasonal work for mowing, fertilizing, liming, watering, pruning, fire controls, weed and pest control, re-seeding, and timely repairs, as required. Maintenance of vegetative areas shall also include removal of debris and protection from unintended uses or traffic.

## 3.0 SITE WASTE MANAGEMENT AND SPILL PREVENTION

The following measures should be implemented to ensure the proper storage and disposal of construction site wastes:

- Designate waste collection areas that do not receive significant runoff from upland areas and that are not adjacent to waterbodies;
- Cover waste containers;
- Schedule waste collection at appropriate intervals to prevent overfilling of containers;
- Conduct all maintenance and vehicle washing off-site;
- Clean up any spills immediately and dispose of in accordance with applicable state and local laws;
- Maintain (contractor) adequate spill prevention materials (e.g., absorbent pads, booms) on-site;
- Any petroleum products stored on-site should be placed in curbed/diked areas;
- Storage areas and waste containers should be included in the regular inspection program of the site;
- In the event of a spill occurrence, the following actions are to be taken:

    1. Document the spill and report to the Project Site foreman and construction inspector.
    2. For spills less than 5 gallons on an impervious surface, attempt to confine and clean the spill.
    3. For spills greater than 5 gallons, attempt to confine the spill and call a remediation contractor if assistance is required with product recovery and containment.
    4. For spills greater than 5 gallons, report them to NYSDEC Spill Hotline (1-800-457-7362) within two hours of discovery.
    5. Provide written documentation of the spill.
    6. Disposal of recovered materials must be conducted in accordance with state and federal regulations.

# 4.0 SITE ASSESSMENT AND INSPECTION

## 4.1 Initial Inspection

Noble will employ a qualified inspector (defined as a person knowledgeable in the principles and practices of sediment and erosion control, such as a licensed Professional Engineer, Certified Professional in Sediment and Erosion Control [CPESC], licensed landscape architect, or other NYSDEC endorsed individual), to conduct an assessment of the site prior to the commencement of construction. The qualified inspector will certify that the appropriate erosion and sediment control methods as described in this SWPPP and as required by the permit have been adequately installed or implemented to ensure overall preparedness of the site for commencement of construction. The qualified inspector will meet the requirements of the *SPDES General Permit for Stormwater Discharges from Construction Activity*.

## 4.2 Inspections and Records during Construction

### 4.2.1 Inspection Frequency

After commencement of construction, site inspections will be conducted by a qualified inspector at least every seven calendar days (weekly), twice every seven calendar days when 5 or more acres is disturbed at one time, and after storm events in accordance with the *New York State Standards and Specifications for Erosion and Sediment Control*. Prior to filing a Notice of Termination (NOT) form with NYSDEC or at the end of the permit term, Noble will have the qualified inspector perform a final site inspection and provide a signature on the NOT that affirms that the site has undergone final stabilization in accordance with the *SPDES General Permit for Stormwater Discharges from Construction Activities*.

### 4.2.2 Records during Inspection

A site map and the SWPPP will be maintained on the Project Site indicating the extent of all disturbed on-site areas and drainageways throughout the duration of construction. The site map will contain all areas expected to undergo initial disturbance or significant site work within every 14-day period. The map will indicate all areas of the site that have undergone temporary or permanent stabilization. All disturbed areas that have not undergone active site work during the previous 14-day inspection period shall be noted on the map. All sediment control measures shall be inspected and the degree of accumulation as a percentage of the sediment storage volume will be recorded. Any maintenance required for installed erosion and sediment control structures will be noted, and documentation of areas where adjustments are needed to those measures shall be provided within one business day of completion of the inspection. Any deficiencies identified with the implementation of the SWPPP shall be recorded.

### 4.2.3 Inspection Log Book

Noble and the selected contractor(s) shall maintain an inspection log book, containing a record of all inspection reports. The log book shall be maintained on site and shall be made available to the permitting authority upon request.

### 4.2.4 Certifications

At the final site inspection, a qualified inspector will certify that the site has undergone final stabilization, meaning that all soil disturbance activities have ceased and a uniform perennial vegetative cover with a density of 80% over the entire pervious surface has been established; or other equivalent stabilization methods. The qualified inspector must also certify on the NOT that all temporary erosion and sedimentation measures have been removed and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are

operational. Noble will certify that the requirements of the permit have been satisfied within 48 hours of actually meeting such requirements and will submit a Notice of Termination (NOT) form with NYSDEC.

# F

# Drain Tile Repair

The specific locations of drain tile within the Project Area have yet to be determined. As part of the construction effort, Noble will coordinate with affected landowners and, if necessary, the Chautauqua County Soil and Water Conservation District to determine the locations of Tile in relation to Project facilities. If Tile is damaged during construction or operation of the Project, the Tile will be repaired in manner that restores the Tile's operating condition at the point of repair. If Tiles, within the Project's construction area defined limits, are adversely affected by the construction activities, Noble will take such actions as are necessary to restore the functioning of the Tile, including the relocation, reconfiguration, and replacement of the existing Tile. All existing drain tiles, either clay or PVC, shall be replaced with new PVC materials. The affected Landowner or Tenant may elect to negotiate a fair settlement with Noble for the Landowner or Tenant to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged Tile.

Within construction limits the damaged Tile will be repaired by Noble, using the following standards and policies:

1. Noble will endeavor to locate all tile lines within the ROW prior to construction in an area so Tile damage can be prevented or minimized. Noble will contact affected Landowners or Tenants for their knowledge of Tile locations prior to construction. Noble commits to work with landowners who have planned future drain tile. If planned tile installation overlaps with the construction effort, Noble will work with the landowner's tile installer to coordinate the tile installation and construction effort. During operations Noble will continue to work with landowners to ensure that tile can be installed with minimal disruption to Windpark facilities. All identified Tile lines will be flagged prior to construction to alert construction crews to the possible need for Tile repairs. Tile that is damaged, cut, removed or otherwise discovered will be distinctly marked by placing a highly-visible flag at the edge of the construction ROW directly opposite such Tiles. This marker will not be removed until the Tile has been permanently repaired or replaced, if needed. In addition to the aforementioned marking, the exact location will be noted, either with a GPS coordinate or a measurement from a previously surveyed location (e.g. stationed survey stake).

2. If water is flowing through a damaged Tile, or if water subsequently flows through a damaged Tile, temporary repairs, coordinated with the affected landowner, will be promptly made and maintained in good condition until such time that permanent repairs can be made. If the Tile is dry and water is not flowing, temporary repairs are not required if permanent repair is made within 14 days of the time the damage occurred. If temporary repair of the Tile is not made, the upstream exposed Tile shall not be obstructed but shall nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the Tile system, and the downstream Tile entrance shall be capped or filtered to prevent entry of mud or foreign material into the Tile if the water level rises in the trench. All temporary and permanent Tile repair will be conducted in coordination with the landowner and, to the extent practicable, in accordance with appropriate NYSDAM. Guidelines.

3. Noble will make reasonable efforts to complete permanent Tile repairs within 14 days after Final Clean-Up, taking into account weather and soil conditions.
    a. All damaged, broken, or cracked Tile shall be removed.
    b. Only unobstructed Tile shall be used for replacement.
    c. The Tile furnished for replacement purposes shall be of a quality, size and flow capacity at least equal to that of the Tile being replaced.

    Tile shall be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings with other utilities.

4. The replaced Tile shall be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used shall be sand filled sacks set on pipe or bottom of channel for support.

5. Before completing permanent Tile repairs, all Tile lines shall be examined either visually, by probing or by other appropriate means on both sides of the trench, within any work area, to check for Tile that might have been damaged by construction equipment. If Tile lines are found to be damaged, they will be repaired to operate similar to its existing conditions before construction began.

6. Prior to backfilling of the applicable trench area, each permanent Tile repair shall be inspected for compliance by Noble's Environmental Monitor. The Monitor will provide written reports and documentation for private Tile crossings and repairs to the affected landowner, and the Town or County, where requested.

7. The backfill surrounding the permanently repaired Tile shall be completed in a timely fashion and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the Tile line. The backfill shall be inspected for compliance with all applicable specification and landowner requests by Noble's Environmental Monitor.

8. After Project construction and permanent repair of affected Tile, for a period of 5 years, if it becomes apparent the Tile line in the area disturbed by construction is not functioning correctly resulting from the Project's construction or operation, Noble shall make further repairs as necessary to restore subsurface drainage. Noble will work jointly with landowners to investigate potential Title damage. If there is a dispute concerning Tile damage, Noble will employ a Tile specialist as needed to determine the cause of the malfunction. Noble agrees to reimburse landowners for expenses related to investigating damaged Tile if the damage is determined to be caused by the construction or operation of the Project.

Rock Removal

The following conditions with respect to rock removal will apply on Agricultural Land:

1. Rock excavated from the drain tile repair, or bore pits, or other excavations may be used to backfill the trench only to the top of the existing bedrock profile.

# G Wetlands and Waterbodies Report

# Wetlands and Waterbodies Report for the Generation Portion and Transmission Portion of the Noble Ball Hill Windpark

## Towns of Hanover and Villenova Chautauqua County, New York

**August 2008**

Prepared for:

**NOBLE ENVIRONMENTAL POWER, LLC**

Prepared by:

**ECOLOGY AND ENVIRONMENT, INC.**
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# List of Abbreviations and Acronyms

| | |
|---|---|
| AA | adjacent area |
| amsl | above mean sea level |
| CFR | Code of Federal Regulations |
| cm | centimeters |
| CWA | Clean Water Act |
| DEIS | Draft Environmental Impact Statement |
| E & E | Ecology and Environment, Inc. |
| ECL | Environmental Conservation Law |
| FEIS | Final Environmental Impact Statement |
| GPS | global positioning system |
| JD | Jurisdictional Determination |
| kV | kilovolt |
| MW | megawatt |
| Noble | Noble Ball Hill Windpark, LLC |
| NWI | National Wetland Inventory |
| NYSDEC | New York State Department of Environmental Conservation |
| PEM | palustrine emergent wetland |
| PFO | palustrine forested wetland |
| PSS | palustrine scrub-shrub wetland |
| ROW | right-of-way |
| SEQRA | State Environmental Quality Review Act |

## List of Abbreviations and Acronyms (cont.)

| | |
|---|---|
| t | trout |
| ts | trout spawning |
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |

# 1 Introduction

This report has been prepared to support the Ball Hill Windpark (the Project) Draft Environmental Impact Statement (DEIS) for Noble Ball Hill Windpark, LLC (Noble) and to support the Joint Permit Application submitted to the United States Army Corps of Engineers (USACE) and the New York State Department of Environmental Conservation (NYSDEC) for the Project. The Project will be reviewed by the local lead agency under the State Environmental Quality Review Act (SEQRA).

Ecology and Environment, Inc. (E & E) delineated and evaluated wetlands and waterbodies within proximity to the Generation and Transmission portions of the Project that are, or have the potential to be, regulated by the USACE under Section 401 and 404 of the Clean Water Act (CWA) and have the potential to be regulated by NYSDEC under Article 24 - Freshwater Wetlands Act, and Article 15 - Protection of Waters Program. This document is intended to provide the results of those delineations along with related information necessary for the USACE and NYSDEC to verify wetland delineations and to make a jurisdictional determination of the wetlands within the area surveyed.

Section 1 of this report provides a general Project description; Section 2 outlines the regulatory framework that governs activities in wetlands and waterbodies; Section 3 provides a description of the ecological setting of the Project Area, including the results of a preliminary data review; Section 4 outlines the methodologies used to conduct field surveys; Section 5 provides the results of field surveys; and Section 6 provides the references used in compiling this report. Appendices A through F provide photo logs and datasheets for each sector and Transmission of the Project Area. Appendix G provides 8.5- by 11-inch, black and white wetland mapping for both the Generation and Transmission portions of the Project. Appendix G also provides wetland mapping on oversized frames with an aerial photograph underlay for use during field verifications.

## Project Description

Noble proposes to construct and operate a wind energy facility (Project) in the Towns of Hanover and Villenova in Chautauqua County, located in western New York State (see Figure 1). The Project consists of two distinct portions: Generation and Transmission (see Figure 2).

The Generation portion of the Project consists of the following:

- Installation and operation of 60 wind turbines (49 turbines in the Town of Villenova and 11 in the Town of Hanover) with a capacity of 90 megawatts (MW) within an approximately 13,658-acre area in the Towns of Villenova and Hanover (see Figure 2);

- Construction and use of approximately 16 miles of access roads (13 miles in the Town of Villenova and 3 miles in the Town of Hanover) that will connect each wind turbine to a Town or County roadway to allow equipment and vehicle access for construction and subsequent maintenance of the facilities as well as access by emergency services, if needed. After construction, the 35-foot-wide access road will be scaled back to 16 feet, allowing Noble to use the existing roadway for maintenance and operational purposes; and

- Construction and use of an electrical collection system that will allow delivery of electricity to a new substation will be constructed in the Town of Hanover. Where practical, the electrical collection system will be installed underground along the same right-of-way (ROW) corridor as the access roads. A total of 23.8 miles of collection (includes collection lines co-located with access roads) will be installed (18.7 miles in the Town of Villenova and 5.1 miles in the town of Hanover). As currently designed, nearly the entire collection system will be installed underground. A total of 174 feet (0.03 miles) of overhead collection lines will be installed in the Town of Villenova. No overhead collection line will be required in the Town of Hanover.

The Transmission portion of the Project consists of the following:

- Construction and use of a new substation (Hanover substation) within the Project Area in the Town of Hanover that will tie into a new 115-kilovolt (kV) Transmission line. The substation footprint will be approximately 200 by 300 feet;

- Construction and use of a 5.95-mile overhead 115-kV Transmission line, located entirely in the town of Hanover to transfer the energy to the proposed switchyard, which will provide access to the grid; and

- Construction and use of a switchyard within the Project Area in the Town of Hanover. The switchyard footprint will be approximately 300 by 500 feet.

This report documents the boundaries of, and provides a description of, the wetlands delineated within the Generation and Transmission portion of the Project.

To facilitate field review and preparation of Jurisdictional Determination (JDs), this report presents the wetland delineation results organized by sectors and

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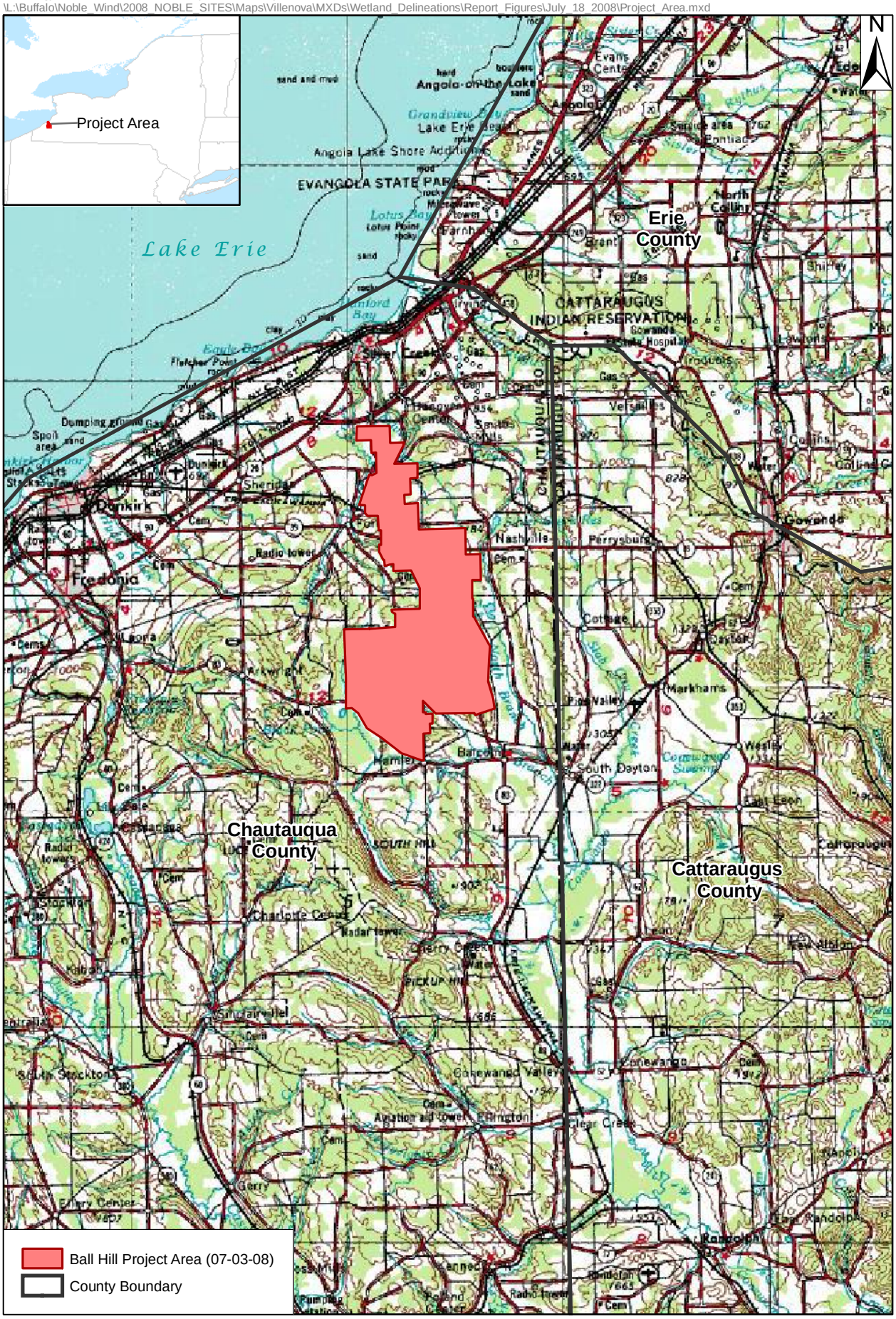


*Source: USGS 1:250,000 Topographic Map Quadrangles: Buffalo, 1967.*

**Figure 1: Project Area**
**Noble Ball Hill Windpark**

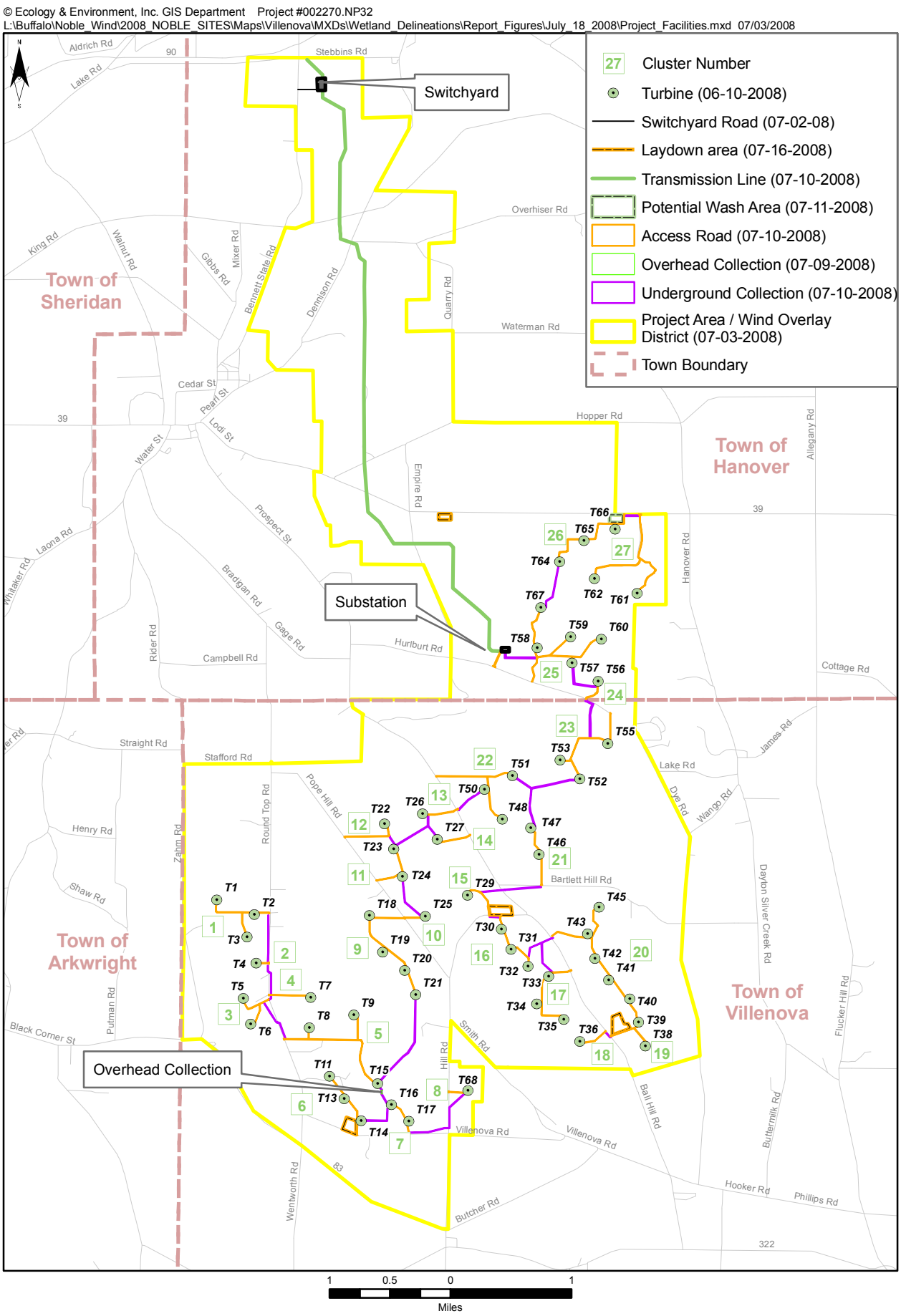


Figure 2: Project Facilities
Noble Ball Hill Windpark

clusters. Each sector includes multiple turbine clusters along with associated access roads and collection lines that are in geographic proximity to each other (i.e., Sector A includes all facilities west of Round Top Road). Each cluster is identified by the primary access road to the turbine grouping (i.e., Cluster 1 is served by Access Road 1). Figure 2 and Table 1 identify the layout and location of each sector and cluster, and all associated facilities. These divisions are for the sole purpose of organizing work flow and discussion and do not imply any separation of facilities.

**Table 1 Turbine Clusters**

| Sector | Cluster Number | Turbine Numbers Included in the Cluster | Access Road Serving the Cluster | Municipality |
|---|---|---|---|---|
| A | 1 | Turbines T1, T2, and T3 | 1 | Town of Villenova |
| A | 2 | Turbine T4 | 2 | Town of Villenova |
| A | 3 | Turbines T5 and T6 | 3 | Town of Villenova |
| B | 4 | Turbine T7 | 4 | Town of Villenova |
| B | 5 | Turbines T8, T9 and T15 | 5 | Town of Villenova |
| B | 6 | Turbines T11, T13 and T14 | 6 | Town of Villenova |
| B | 7 | Turbines T16 and T17 | | Town of Villenova |
| B | 8 | Turbine T68 | | Town of Villenova |
| B | 9 | Turbines T18, T19, T20 and T21 | 9 | Town of Villenova |
| B | 10 | Turbine T25 | 10 | Town of Villenova |
| C | 11 | Turbines T23 and T24 | 11 | Town of Villenova |
| C | 12 | Turbine T22 | 12 | Town of Villenova |
| C | 13 | Turbine T26 | 13 | Town of Villenova |
| C | 14 | Turbine T27 | 14 | Town of Villenova |
| C | 15 | Turbine T29 | 15 | Town of Villenova |
| C | 16 | Turbines T30, T31 and T32 | 16 | Town of Villenova |
| C | 17 | Turbines T33, T34 and T35 | 17 | Town of Villenova |
| C | 18 | Turbine T36 | 18 | Town of Villenova |
| D | 19 | Turbines T38 | 19 | Town of Villenova |
| D | 20 | Turbines T39, T40, T41, T42, T43 and T45 | 20 | Town of Villenova |
| D | 21 | Turbines T46 and T47 | 21 | Town of Villenova |
| D | 22 | Turbines T48, T50 and T51 | 22 | Town of Villenova |
| E | 23 | Turbines T52, T53 and T55 | 23 | Town of Hanover |
| E | 24 | Turbine T56 | 24 | Town of Hanover |
| E | 25 | Turbines T57, T58, T59, T60 and T67 | 25 | Town of Hanover |
| E | 26 | Turbines T64, T65 and T66 | 26 | Town of Hanover |
| E | 27 | Turbines T61 and T62 | 26 | Town of Hanover |

The following terms are used throughout this document to describe the proposed action.

- **Project.** "Project" refers to all activities involved in the construction and operation of the Windpark described above and all components thereof, including, but not limited to, the Generation and Transmission portion of the Project. Hereinafter, the terms Project and Windpark can be used interchangeably.

- **Project Area.** The Project Area is denoted by the outer boundary of the geographic area that includes all turbine sites, access roads, collection system components, and Transmission line components. The Project Area includes the Generation portion of the Project in the Towns of Hanover and Villenova (see Figure 2) and the Transmission portion of the Project in the Town of Hanover (see Figure 2).

- **Project Site.** The Project Site contains all portions of the Project Area that have the potential to be permanently or temporarily disturbed as a result of the construction or operation of Project facilities (including wind turbines, electrical collection, utility trenches, utility poles, access roads, staging areas, Transmission lines, and other related structures). However, the haul roads, laydown areas, substation access road, and switchyard access road have yet to be fully identified and the results of further investigations will be included in the Final Environmental Impact Statement (FEIS). Noble has obtained property interests for all parcels that will host turbines within the Project Site.

- **Generation Portion of the Project.** That portion of the Project Area comprising the wind turbines (including blades, towers, pads, and foundations); electrical collection lines and poles; trenches; access roads; and related structures required for generating wind energy.

- **Transmission Section.** The new Transmission line and associated permanent ROW between the Hanover substation and the proposed Hanover switchyard (see Figure 2).

- **Survey Corridor.** The limit of the corridor within which wetlands and waterbodies were delineated and for which a jurisdictional determination is being sought. It pertains solely to those wetlands and waterbodies identified in the Generation and Transmission portion of the Project and generally includes a 200- to 300-foot corridor centered on linear facilities and a circular area with a 250-foot radius surrounding each turbine. In some areas surveys were restricted or expanded (i.e., restricted because of property access or expanded to ensure that regulated buffers adjacent to NYSDEC wetlands were identified). This report pertains only to wetlands and waterbodies delineated in the Survey Corridor. The extent of the Survey Corridor for which a jurisdictional determination is sought is depicted on the mapping for each sector and Transmission in Appendix G.

- **Sector.** One or more turbine clusters in close geographic proximity to each other (see Figure 2).

- **Turbine Cluster.** One or more wind turbines in geographic proximity that are served by a single system of access roads and collection lines (see Figure 2).

# 2 Regulatory Review and Permit Requirements

This report was prepared to address the requirements of the CWA of 1977; New York State Article 15, Title 5; and New York State Article 24. Each of these requirements is discussed below.

## 2.1 Clean Water Act

The CWA was implemented to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Under Sections 401 and 404 of the CWA, permits must be issued for certain activities that may impact wetlands and waterways. Section 401 of the CWA requires state approval for any federally permitted action impacting waters of the United States to ensure that the permitted action will not violate the state's water quality standards or impair designated uses. The New York State agency responsible for administering the Section 401 program is NYSDEC. Section 404 of the CWA requires that a permit be obtained for the discharge of dredged or fill material into waters of the United States, including wetlands and streams. Waters of the United States are defined under 33 Code of Federal Regulations (CFR), and wetlands are specifically defined under 33 CFR Part 328.3(b). The permitting agency responsible for Section 404 permits is the USACE. The Project falls within the jurisdiction of USACE Buffalo District and within the jurisdiction of Region 9 of NYSDEC.

A pre-application meeting for this Project is expected to be held in August 2008 with a representative of USACE. The intent of this meeting was to provide a general overview of the Project and to discuss permitting for a project of this nature.

## 2.2 New York State Environmental Conservation, Law Article 15, Title 5

These regulations of the New York State Environmental Conservation Law (ECL), also known as the "Protection of Waters" Program, are designed to regulate any activities that could impact protected watercourses within New York State. Protected waters include all waters classified as C(t), C(ts), B, or A, as well as all navigable waters. Article 15 covers disturbances of streambeds and banks and disposal of fill material and excavation in protected waterbodies. Application for a permit under Article 15 is completed jointly with the USACE permit application. The Project Area falls within the jurisdiction of Region 9 of NYSDEC.

## 2.3 New York State Environmental Conservation Law, Article 24

Article 24 of the New York State ECL is titled the New York Freshwater Wetland Act. This law provides for regulation of certain activities that could adversely affect wetlands of 5 hectares (12.4 acres) or more as well as smaller wetlands identified as having an unusually significant local value. Activities that occur within 30.5 meters (100 feet) of the wetland boundary are also regulated. NYSDEC maintains a database (both in map form and electronic) identifying regulated state wetland complexes. While the NYSDEC database provides the basis for state regulation of wetland complexes, the actual extent of field jurisdiction is based on the actual boundaries of the wetlands, which can be expanded or modified based on in-field review and delineation of existing wetland boundaries. Application for a permit under Article 24 is completed jointly with the USACE permit application.

Pre-application meetings for this Project are expected to be held in August 2008 with representatives of NYSDEC. The intent of these meetings was to provide a general overview of the Project and to discuss permitting for a project of this nature.

# 3 Project Area Description

## 3.1 General Project Area Description

The Generation portion of the Project Area is located in the Towns of Hanover and Villenova in Chautauqua County, and the Transmission portion is located in the Town of Hanover. The Project Area is located in the Appalachian Uplands physiographic province of New York State in western New York approximately 65 kilometers (40 miles) southwest of Buffalo. An aerial photograph of the Project is depicted in Figure 3. The area consists of a plateau that is dissected by streams. The Project Area is located within the Chautauqua-Conneaut and Conewango watersheds. Within the Project Area, elevations range from less than 1,130 feet to slightly greater than 1,660 feet above mean sea level (amsl). Because of engineering constraints posed by steep slopes to the siting of wind facilities, the majority of the Survey Corridor is located in areas that are generally characterized by slight to moderate sloping topography. Figure 4 shows the Project Area on a United States Geological Survey (USGS) Quadrangle Map.

The Project Area is generally characterized by deciduous, hemlock and some mixed forest and agricultural fields (pasture/hay, row crops, and vineyards). There are also many reverting fields in several stages of succession (old field, shrubland, and young forest), scattered residences, wetlands, and open water features, such as farm ponds. Agriculture within the Project Area consists of a mixture of hay production, pasture, row cropping, and vineyards. Corn is the predominant row crop in the area. The forested communities throughout the Project Area include a mixture of beech-maple forest, successional northern hardwood forest, and hemlock-northern hardwoods. Current and historic silviculture is evident throughout the Project Area and forest stands range from recently timbered to more mature. The general population pattern in the area is rural residential, consisting of scattered residences along roads. Residences are a mixture of active farmsteads and seasonal residences.

## 3.2 Preliminary Data Review

Prior to performing fieldwork, background information was reviewed to assist in the initial identification of wetlands and waterbodies.

### 3.2.1 Review of Existing Wetland Information

Information sources used to determine the possible presence of wetlands included color-infrared aerial photographs of the Project Area (see Figure 3); USGS 7.5-Minute Series topographic maps (see Figure 4); United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and NYSDEC Freshwater Wetlands maps (see Figure 5); and Chautauqua County soil survey (see Figure 7).

USGS topographic maps and aerial photos indicate the possible presence of wetlands in the Survey Corridor. The NWI maps depict wetlands occurring throughout the Survey Corridor. NYSDEC Freshwater Wetlands Maps depict seven state-regulated wetlands within the proposed Project Area The Chautauqua County Soil Survey indicate the presence of hydric soils and soils with potential hydric inclusions in the Survey Corridor. Based on the results of the desktop review, it was determined that field verification would be required to determine the presence and extent of wetlands in the Survey Corridor.

#### Wetlands under State Jurisdiction

Under Article 24 of the New York State ECL, New York State regulates wetlands that exceed 5 hectares (12.4 acres) or have locally significant ecological value. New York State also regulates a 100-foot upland buffer area surrounding each regulated wetland to protect the wetland. Work within state-regulated wetlands and the regulated adjacent area (AA), including removal of vegetation, requires a permit from NYSDEC.

Based on analysis of NYSDEC mapping, seven wetlands under the jurisdiction of New York State (totaling approximately 249 acres) lie within the Generation and Transmission portion of the Project Area. Of these wetlands, five are located within the Generation portion of the Project area (approximately 178 acres) and two are located within the Transmission portion of the Project area (approximately 71 acres). These wetlands were avoided during the siting process as much as possible; however, the NYSDEC wetlands SC-12 and SC-13 located in the transmission portion are located with the Survey Corridor and were partially delineated. Table 2 provides a listing of the NYSDEC-mapped wetlands within the Project Area along with the wetland class. Noble recognizes that NYSDEC may expand their jurisdictional authority to encompass additional wetland areas not specifically identified on existing mapping if the wetlands are determined to be connected to existing mapped resources, or meet the size criteria for jurisdiction. While Noble has attempted to define potential state jurisdiction as part of the delineation effort (see Section 5.1.3 for additional discussion), NYSDEC jurisdiction would not be established until after the NYSDEC field review.

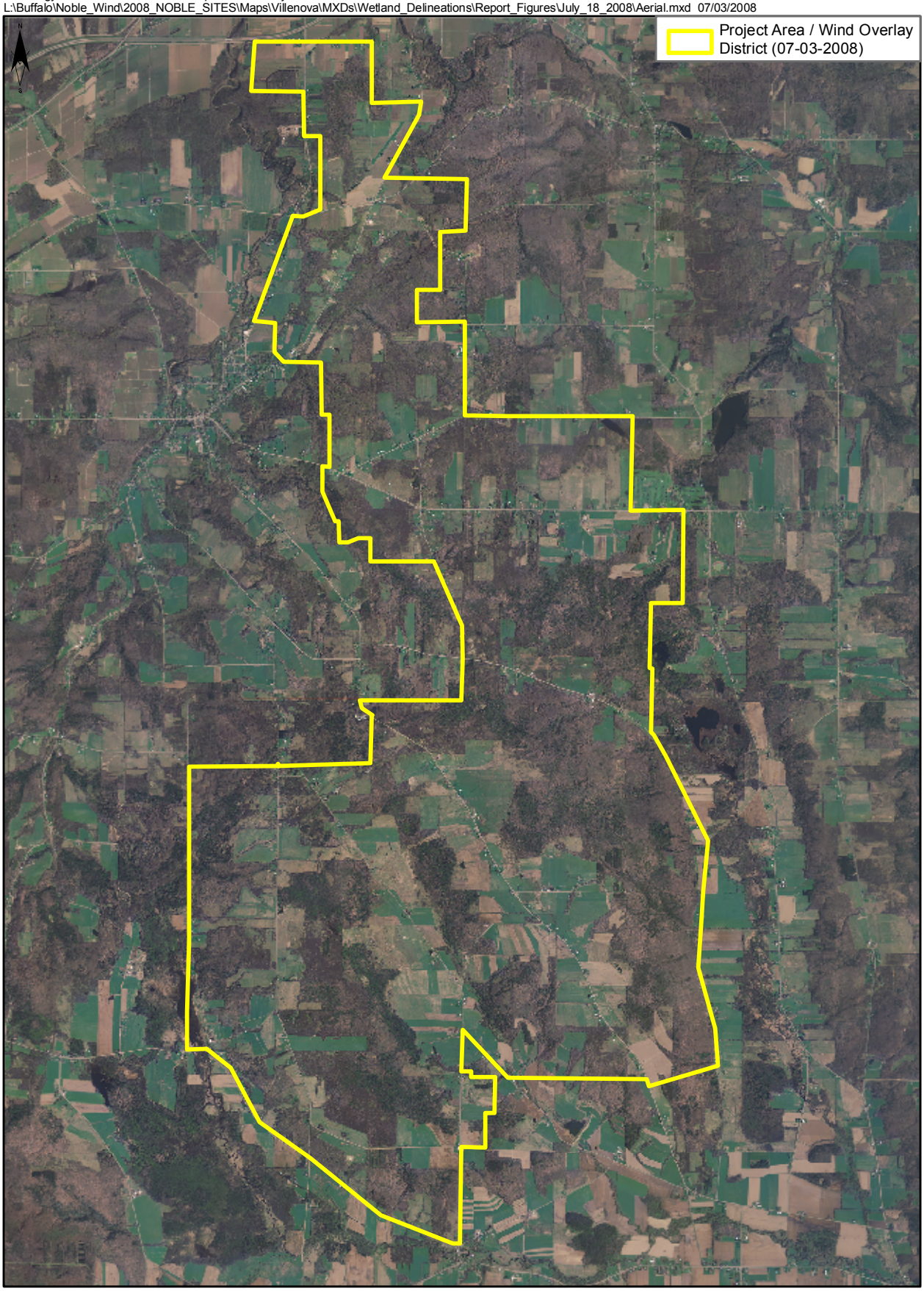


Figure 3: Aerial Photograph
Noble Ball Hill Windpark

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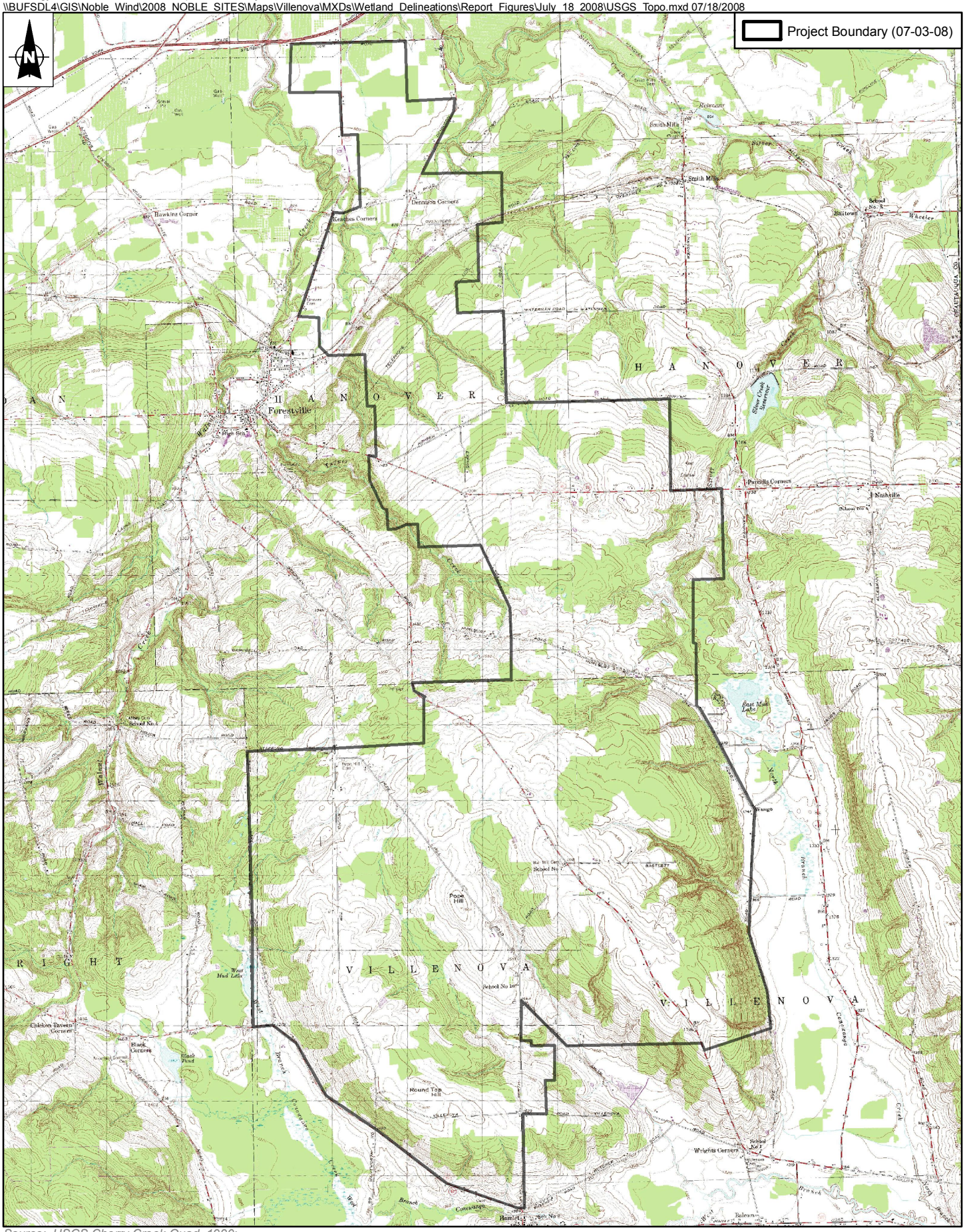


*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Figure 4: Topographic Map**
**Noble Ball Hill Windpark**

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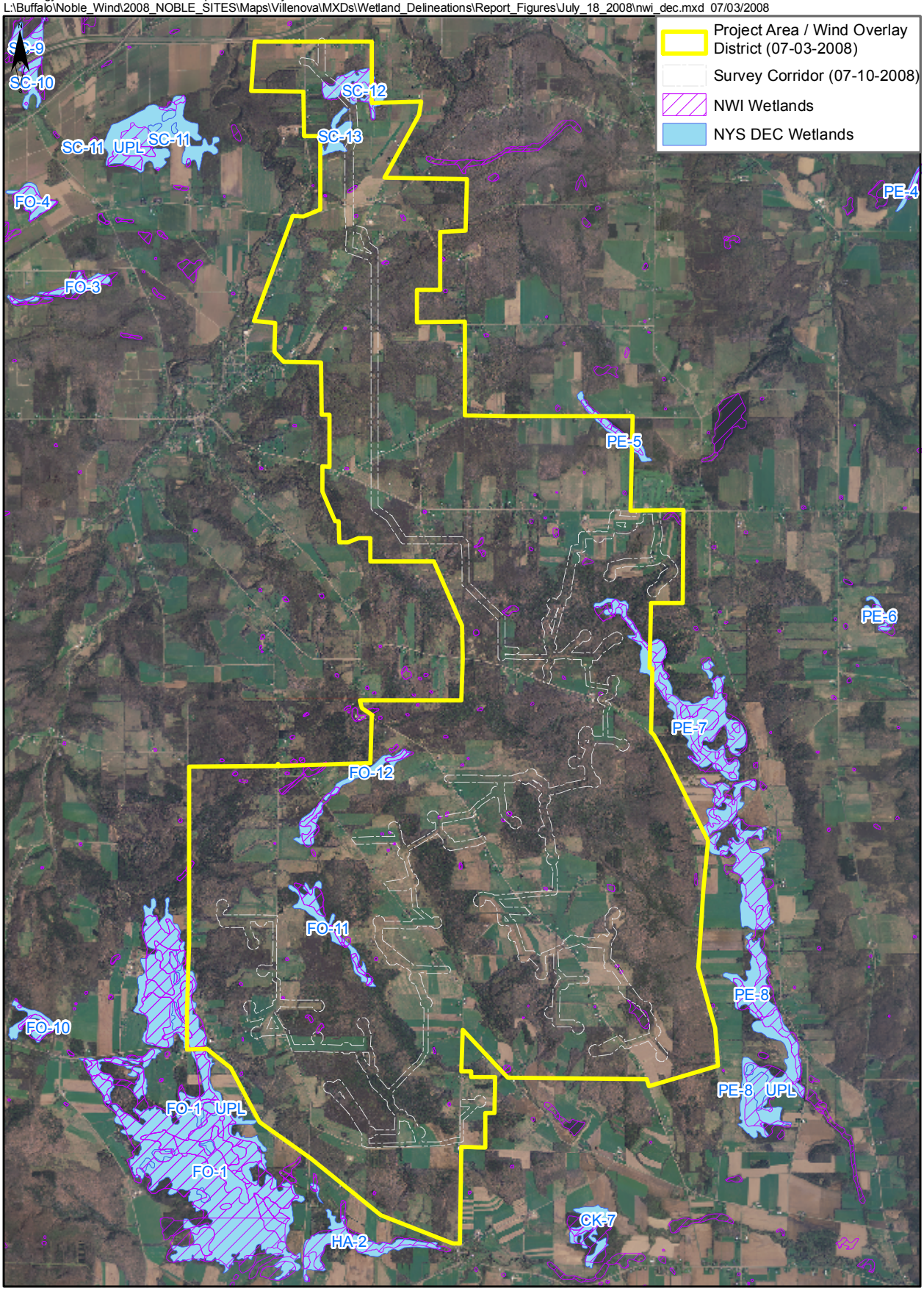


Source: NYS GIS Clearinghouse, 2004.

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Miles

Figure 5: NWI and DEC Mapped Wetlands
Noble Ball Hill Windpark

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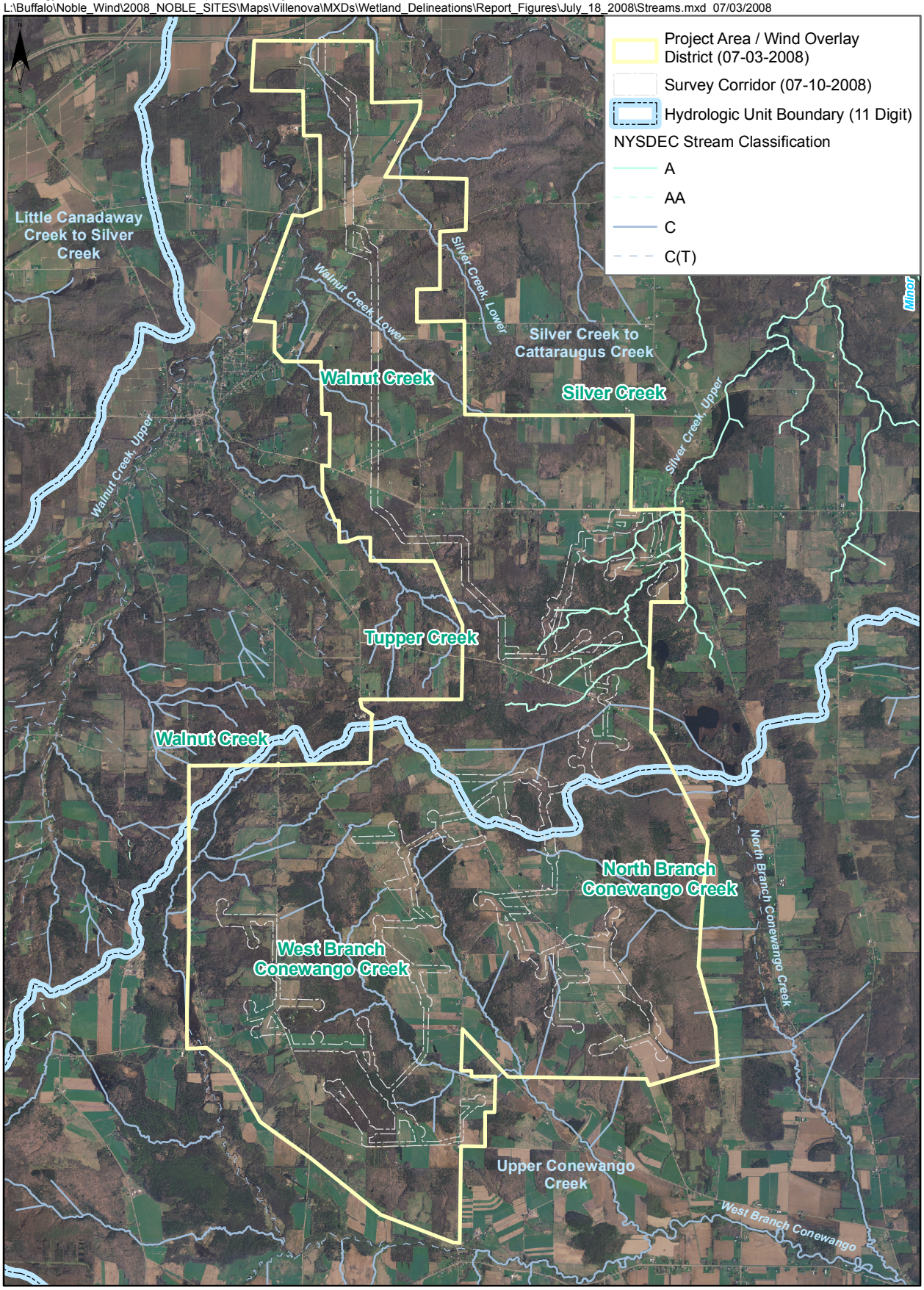


Source: NYS GIS Clearinghouse, 2004.

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Figure 6: NYSDEC Streams and Associated Watersheds
Noble Ball Hill Windpark

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| SOIL TYPE | HYDRIC |
|---|---|
| Ad | Alden mucky silt loam |
| As | Ashville silt loam |
| BrA | Barcelona silt loam, 0 to 3 percent slopes |
| BrB | Barcelona silt loam, 3 to 8 percent slopes |
| BsA | Busti silt loam, 0 to 3 percent slopes |
| BsB | Busti silt loam, 3 to 8 percent slopes |
| BsC | Busti silt loam, 8 to 15 percent slopes |
| Cb | Canandaigua silt loam, loamy substratum |
| Ce | Carlisle muck |
| ChB | Chadakoin silt loam, 3 to 8 percent slopes |
| ChC | Chadakoin silt loam, 8 to 15 percent slopes |
| ChD | Chadakoin silt loam, 15 to 25 percent slopes |
| ChE | Chadakoin silt loam, 25 to 35 percent slopes |
| ChF | Chadakoin silt loam, 35 to 50 percent slopes |
| CkB | Chautauqua silt loam, 3 to 8 percent slopes |
| CkC | Chautauqua silt loam, 8 to 15 percent slopes |
| CkD | Chautauqua silt loam, 15 to 25 percent slopes |
| CnA | Chenango gravelly loam, 0 to 3 percent slopes |
| CnB | Chenango gravelly loam, 3 to 8 percent slopes |
| CnC | Chenango gravelly loam, 8 to 15 percent slopes |
| CoA | Chenango channery loam, fan, 0 to 3 percent slopes |
| CoB | Chenango channery loam, fan, 3 to 8 percent slopes |
| CpA | Churchville silt loam, 0 to 3 percent slopes |
| CsB | Collamer silt loam, 3 to 8 percent slopes |
| CsC | Collamer silt loam, 8 to 15 percent slopes |
| DaA | Dalton silt loam, 0 to 3 percent slopes |
| DaB | Dalton silt loam, 3 to 8 percent slopes |
| DeA | Darien silt loam, 0 to 3 percent slopes |
| DeB | Darien silt loam, 3 to 8 percent slopes |
| ElA | Elnora fine sandy loam, 0 to 3 percent slopes |
| ElB | Elnora fine sandy loam, 3 to 8 percent slopes |
| ErA | Erie silt loam, 0 to 3 percent slopes |
| ErB | Erie silt loam, 3 to 8 percent slopes |
| Fe | Fluvaquents-Udifluvents complex, frequently flooded |
| FmA | Fremont silt loam, 0 to 3 percent slopes |
| FmB | Fremont silt loam, 3 to 8 percent slopes |
| FmC | Fremont silt loam, 8 to 15 percent slopes |
| FmD | Fremont silt loam, 15 to 25 percent slopes |
| Ha | Halsey mucky silt loam |
| HrA | Hornell silt loam, 0 to 3 percent slopes |
| HrB | Hornell silt loam, 3 to 8 percent slopes |
| HrC | Hornell silt loam, 8 to 15 percent slopes |
| HrD | Hornell silt loam, 15 to 25 percent slopes |
| LnB | Langford silt loam, 3 to 8 percent slopes |
| LnC | Langford silt loam, 8 to 15 percent slopes |
| Me | Middlebury silt loam |
| Mn | Minoa fine sandy loam |
| NgA | Niagara silt loam, 0 to 3 percent slopes, loamy substratum |
| NgB | Niagara silt loam, 3 to 8 percent slopes, loamy substratum |
| OrA | Orpark silt loam, 0 to 3 percent slopes |
| OrB | Orpark silt loam, 3 to 8 percent slopes |
| OrC | Orpark silt loam, 8 to 15 percent slopes |
| Pa | Palms muck |
| Po | Pompton silt loam |
| RaA | Raynham silt loam, 0 to 3 percent slopes |
| Rh | Red Hook silt loam |
| RnA | Rhinebeck silt loam, 0 to 3 percent slopes |
| RoF | Rock outcrop-Manlius complex, 35 to 70 percent slopes |
| Sa | Saprists and Aquents, ponded |
| ShB | Schuyler silt loam, 3 to 8 percent slopes |
| ShC | Schuyler silt loam, 8 to 15 percent slopes |
| ShD | Schuyler silt loam, 15 to 25 percent slopes |
| ShE | Schuyler silt loam, 25 to 35 percent slopes |
| ShF | Schuyler silt loam, 35 to 50 percent slopes |
| Sw | Swormville silt loam |
| ToB | Towerville silt loam, 3 to 8 percent slopes |
| ToC | Towerville silt loam, 8 to 15 percent slopes |
| ToE | Towerville silt loam, 25 to 35 percent slopes |
| ToF | Towerville silt loam, 35 to 50 percent slopes |
| UnC | Unadilla silt loam, 8 to 15 percent slopes |
| VaB | Valois gravelly silt loam, 3 to 8 percent slopes |
| VaC | Valois gravelly silt loam, 8 to 15 percent slopes |
| VaD | Valois gravelly silt loam, 15 to 25 percent slopes |
| VaE | Valois gravelly silt loam, 25 to 35 percent slopes |
| VaF | Valois gravelly silt loam, 35 to 50 percent slopes |
| VcC | Valois gravelly silt loam, rolling |
| W | Water |
| Wy | Wayland silt loam |

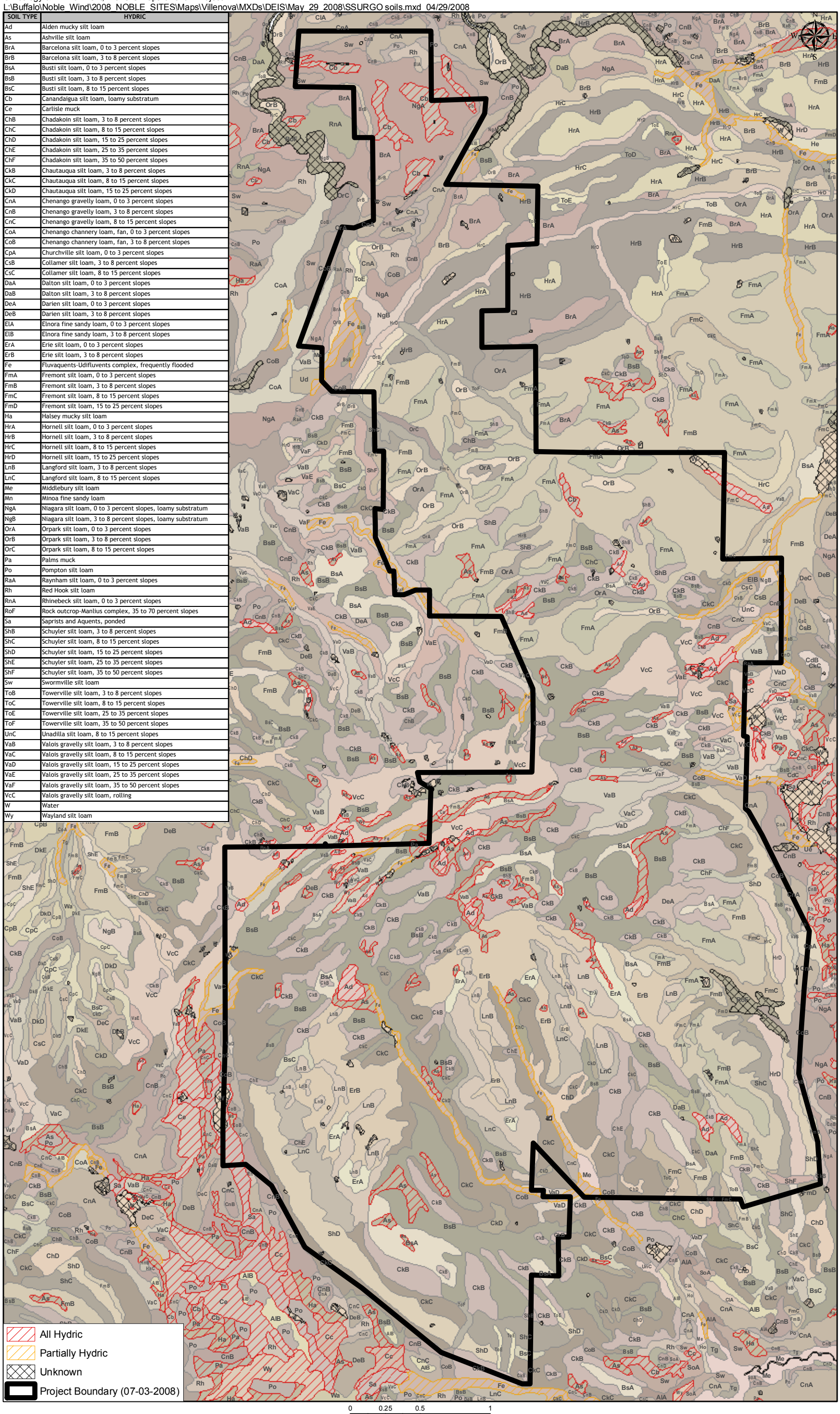


Figure 7: SSURGO Soils
Noble Ball Hill Windpark

**Table 2 Mapped NYSDEC Wetlands in the Project Area**

| NYSDEC Wetland ID | Class |
|---|---|
| **Generation Portion** | |
| FO-1 | I |
| FO-11 | II |
| FO-12 | II |
| PE-5 | III |
| PE-7 | II |
| **Transmission Portion** | |
| SC-12 | II |
| SC-13 | III |

Data provided by NYSDEC indicates that the wetlands within the Survey Corridor are Class I, Class II, or Class III wetlands. According to NYSDEC, Class I wetlands provide the highest function and greatest benefit of all NYSDEC-classified wetlands and are afforded the greatest amount of protection. Impacts on Class I wetlands are permitted, but only if it is determined that the proposed activity satisfies a compelling economic or social need that clearly and substantially outweighs the loss of or detriment to the benefit(s) of the Class I wetland. Class II wetlands provide important wetland benefits, the loss of which is acceptable only in very limited circumstances. Impacts on Class II wetlands are permitted, but only if it is determined that the proposed activity satisfies a pressing economic or social need that clearly outweighs the loss of or detriment to the benefit(s) of the Class II wetland. Class III wetlands supply wetland benefits, the loss of which is acceptable only after the exercise of caution and discernment. Impacts on Class III wetlands are permitted only if it is determined that the proposed activity satisfies an economic or social need that outweighs the loss of or detriment to the benefit(s) of the Class III wetland.

### 3.2.2 Review of Existing Stream Information

The USGS 7.5-Minute Series topographic maps (see Figure 4) were reviewed to determine the location and names of streams in the Project Area. NYSDEC Stream Classification data was reviewed to determine the presence of streams protected by New York State under ECL Article 15 (see Figure 6). In addition, state 303(d) and 305(b) databases were reviewed to determine the water quality of waterbodies in the Project Area.

### Watersheds and Water Quality

The Project Area is located within the Chautauqua-Conneaut and Conewango watersheds. The watershed boundary locations in relation to the Project Area are depicted in Figure 6. The Chautauqua-Conneaut watershed drains generally north and west to Lake Erie. The Conewango watershed generally drains south along Conewango Creek before reaching the Allegheny River. The Chautauqua-Conneaut and Conewango watersheds have been designated as Category II water-

sheds by the New York Unified Watershed Assessment Program. Category II watersheds are defined as those currently meeting water quality goals (NYSDEC 1998). No waterbodies within the Project Area are listed on the New York State Section 303(d) List of Impaired Waters, and no impaired waters or priority listed waters are located within the Project Area (NYSDEC 2008). The watershed boundary locations in relation to the Survey Corridor are depicted in Figure 6.

### NYSDEC Stream Classification

NYSDEC stream classification data were reviewed to determine whether streams in the Project Area are protected by New York State under Article 15 of the ECL. NYSDEC uses a stream classification system in order to identify the value and uses of watercourses in the state. A protected stream is any stream or particular portion of a stream for which any of the following classifications or standards have been adopted by the department or any of its predecessors: AA, AA(t), A, A(t), B, B(t), or C(t). Streams designated as (t) (trout) also include those more specifically designated as (ts) (trout spawning). Disturbance to the bed or banks of protected streams requires a permit under Article 15 of the New York ECL. The streams in the Project Area are depicted in Figure 6.

The majority of the watercourses mapped within the Project Area are identified as Class C and Class A, with some Class C(t) streams. Class C streams support fishing and fish propagation and primary- and secondary-contact recreation. Of these, some streams within the Project Area are designated Class C(t) and are considered capable of sustaining trout populations. Class A streams are assigned to waters used as a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. Class C(t) and A streams are considered “protected streams” and are given special protection by NYSDEC.

The southern half of the Project Area (Sectors A through C and the southern portion of Sector D) lies within the Conewango watershed, and drains south into the Allegheny River via unnamed tributaries of North Branch Conewango Creek and West Branch Conewango Creek. The southeastern portion of the Project Area drains to North Branch Conewango Creek and the southwestern portion of the Project Area drains to West Branch Conewango Creek. The confluence of North Branch and West Branch occurs south of the Project Area where the stream becomes Conewango Creek. Conewango Creek flows south eventually reaching the Allegheny River in Pennsylvania.

The northern half of the Project Area lies within the Chautauqua-Conneaut Watershed, and drains north into Lake Erie. A small portion of this watershed drains to Tupper Creek, which drains to Walnut Creek in the Village of Forestville. The Tupper Creek watershed overlaps with a small portion of the northwestern section of the Project Area, but is primarily located outside of the Project Area. The Walnut Creek watershed encompasses the northwestern portion of the Project Area, including most of the Transmission section. The headwaters of Silver Creek are

located in northeastern portions of the Generation and Transmission portions of the Project Area, primarily Sector E and portions of the transmission section. Silver Creek flows northwest, through two drinking water reservoirs (Upper Silver Creek Reservoir and Lower Silver Creek Reservoir), before converging with Walnut Creek just before draining to Lake Erie. The majority of the stream features in the Project Area that drain to Silver Creek are located upstream of the Upper Silver Creek Reservoir.

# 4 Methodology

## Siting

Noble undertook a multi-phased siting process to minimize impacts on wetlands to the extent practicable. A wetland study was conducted to determine the extent and quality of wetlands with the potential to be impacted by the Project. The wetlands study consisted of a desktop review of existing wetland location information and mapping, reconnaissance level wetland surveys, and detailed wetland delineations. Each phase of the wetland study was used to refine siting for the Project facilities to minimize impacts on wetlands while balancing impacts on other resources.

The desktop review indicated that wetlands under state and federal jurisdiction were likely to exist within the Project Area. Based on the results of the desktop review, field reconnaissance-level surveys were conducted to develop general siting constraints. The general locations of large wetlands were identified, wetlands and streams were buffered, and these areas were blocked for consideration for turbine siting. Wetlands were considered along with other constraints and a preliminary turbine layout was developed.

A second round of reconnaissance-level surveys was conducted based on the preliminary turbine layout. The primary purpose of the surveys was to refine the preliminary turbine locations to ensure that each site had sufficient space to locate the turbine and associated workspaces outside of wetlands. In addition, preliminary access road routes were identified during this field effort. Project engineers conducted an initial desktop review of the preliminary access roads and a wetland delineation field Survey Corridor was established.

Detailed wetland delineations were conducted in the Survey Corridor based on preliminary siting of facilities. The goal of the detailed wetland delineations was to identify and document wetlands that would potentially be temporarily or permanently disturbed as a result of construction or operation of the proposed facilities.

## Surveys

Surveys for wetland and waterbody resources were generally conducted using a 200- to 300-foot-wide corridor centered on linear facilities (including access

roads, associated electric collection lines connecting the individual turbines, and transmission lines) and a circular area with a 250-foot radius surrounding each turbine. In some areas surveys were restricted or expanded (i.e., restricted because of property access or expanded to ensure that regulated buffers adjacent to NYSDEC wetlands were identified) to accommodate site-specific conditions.

Wetland mapping included in Appendix G (8.5- by 11-inch, black and white mapping, and oversize sector aerial maps) depicts the Survey Corridor in which the surveys were conducted. The 200- to 300-foot-wide survey area around access roads, collection lines, and transmission lines and 250-foot radius surrounding each turbine allowed for an assessment of adjacent ecological communities and provided flexibility for minor shifts in layout of these facilities.

Field surveys were conducted during spring 2008 to:

- Delineate wetland boundaries and characterize wetland functions and values, to obtain sufficient data about individual wetlands within the Survey Corridor to allow for a complete assessment of potential Project-related impacts;

- Characterize all waterbodies and watercourses that occur within the Survey Corridor; and

- Classify the vegetation cover types into distinctive upland, wetland, and aquatic ecological communities.

The field teams used established delineation procedures as outlined in the USACE *Wetland Delineation Manual* (Environmental Laboratory 1987) and the NYSDEC *Freshwater Wetlands Delineation Manual* (1995). The specific procedures used to evaluate the soils, vegetation, and hydrology at each potential wetland location is described below.

## 4.1 Soils

Soils were examined by using a tile spade shovel, or "sharpshooter," to a depth of 36 centimeters (cm) (14 inches). Wherever disturbance of the soils, caused by past excavation or fill activity, was evident the soil characterization was performed in adjacent, undisturbed areas within the potential wetland. Soils were characterized at a depth immediately below the A-horizon or at 30 cm (12 inches), whichever was shallower. Soil colors were identified using a Munsell Soil Color Chart (Munsell 2000), and other characteristics such as the presence of mottles and soil texture were recorded. Hydric characteristics, such as organic soil layers, gleying, mottling, and oxidized rhizospheres were noted where they occurred. The soils were evaluated both within and outside the wetland boundaries.

## 4.2 Hydrology

The *Wetlands Delineation Manual* (Environmental Laboratory 1987) provides guidelines for determining the presence of wetland hydrology. In general, the criteria for wetland hydrology are met if the area is inundated or saturated at the soil surface during the growing season for a time sufficient to develop hydric soils and support hydrophytic vegetation. In some instances, it is necessary to use other field characteristics to identify wetland hydrology. These characteristics may include water staining, sediment deposits, drainage patterns, or drift lines. Hydrologic characteristics, as well as the depth of surface water or depth to soil saturation, were recorded for each wetland area.

## 4.3 Vegetation

To determine the presence of hydrophytic vegetation, the dominant species in each major vegetative stratum (e.g., tree, shrub/sapling, herbaceous, and woody vine) were identified and recorded. Each plant was then assigned a wetland indicator status (i.e., obligate wetland, facultative wetland, facultative, facultative upland, or upland) from USFWS's *National List of Vascular Plant Species that Occur in Wetlands: 1988 National Summary* (USFWS 1988). A prevalence of dominant species that are facultative, facultative wetland, and obligate wetland indicates the presence of hydrophytic vegetation.

## 4.4 Delineation

If the soils, hydrology, and vegetation at a survey point indicated that it was within a wetland, the boundary of the wetland was determined, and it was flagged with wetland delineation tape. The approximate boundary was recorded on site maps, and the flagged boundary was surveyed using a global positioning system (GPS) unit. The electronic files generated from the GPS survey were then downloaded and integrated into the existing alignment drawings to identify where the delineated wetlands and the proposed Project overlapped. Photographs were taken at each wetland, stream, and turbine site, and other points of interest within the Survey Corridor.

# 5 Results

Based on the field investigations conducted by E & E in April, May, and June 2008, 237 wetlands were delineated within the Survey Corridor. Streams and other surface waterbodies also were identified during the field investigation. Multiple streams were identified and delineated within the Survey Corridor. In addition, numerous hydrologic features were delineated within the Survey Corridor and are depicted on the wetland mapping as drains and ponds. These features have been identified in order to characterize the hydrology of the Survey Corridor, and, in many cases, to document the hydrologic connection or lack of connection between delineated wetlands and traditional navigable waters.

Wetland delineation maps (8.5- by 11-inch, black and white, and oversize sector aerial maps, see Appendix G) depict the survey corridor, wetland boundaries, locations of all streams, and photo locations noted within the Survey Corridor during the field delineations. Appendices A through J include the wetland and stream datasheets, and the photographic exhibits for the wetlands and waterbodies identified in the Survey Corridor. Table 3 provides a summary of delineated wetlands and distinguishes between acreages for those with and without an apparent surface water connection to traditional navigable waters. Table 4 summarizes the characteristics of each wetland delineated in the Generation portion of the Survey Corridor. Table 5 summarizes the characteristics of each wetland delineated in Transmission portion of the Survey Corridor. Table 6 summarizes the characteristics of each delineated wetland under NYSDEC jurisdiction in the survey corridor. Table 7 summarizes the characteristics of each stream delineated in the Generation portion of the Survey Corridor. Table 8 summarizes the characteristics of each stream delineated in the Transmission portion of the Survey Corridor.

## 5.1 Wetlands

Two hundred and thirty-seven wetlands were delineated within the Survey Corridor of the Project, totaling approximately 93.68 acres. Seven delineated wetlands corresponded to or were in close proximity to mapped NYSDEC-regulated wetlands. NYSDEC wetland SC-12 located in the Transmission Section is associated with two delineated wetland (SVC18-W110 and SVC10-W111). NYSDEC wetland SC-13 is associated with seven delineated wetlands. Wetlands SVC23-W61/SVC18-61a, SVC23-W63, and SVC23-W64 are located within the boundary

of NYSDEC wetland SC-13. While wetlands SVC22-W59, WVC22-W60, SVC23-W62, and SVC23-W65 are not located within SC-13, they appear to be hydrologically connected, and may be considered jurisdictional by NYSDEC. In addition, one wetland (WNC43-W104) appears to exceed 12.4 acres based on field review, coupled with review of USGS topographic mapping and aerial photography, and as such, is assumed to fall under the jurisdiction of NYSDEC. Final jurisdictional determinations will be made by NYSDEC subsequent to field review. Two hundred and one wetlands, totaling approximately 89.66 acres, were delineated within the Survey Corridor that are likely under the jurisdiction of the USACE and are subject to Section 404 permitting. These 201 wetlands have an obvious direct surface water connection to traditional navigable waters. The remaining 36 wetlands, totaling approximately 4.02 acres, have no obvious surface connections to traditional navigable waters and may not be considered jurisdictional wetlands based on the lack of connectivity to traditional navigable waters. These wetlands are noted, as appropriate, in the hydrology column of Table 4, Summary of Delineated Wetlands, Ball Hill Windpark Generation Portion and Table 5, Summary of Delineated Wetlands, Ball Hill Windpark Transmission Portion. An explanation of why those wetlands are considered to be isolated is included in the comment box.

**Table 3 Summary of Federal and State Jurisdiction of Delineated Wetlands, Ball Hill Windpark**

| Total Acreage of Wetlands Delineated (No. of Wetlands Delineated) | Acreage of Wetlands with Apparent Connection to Traditional Navigable Waters[1] (No. of Wetlands with Apparent Connection to Traditional Navigable Waters) | Acreage of Wetlands with No Apparent Connection to Traditional Navigable Waters[2] (No. of Wetlands with No Apparent Connection to Traditional Navigable Waters) | Acreage of Wetlands Under the Jurisdiction of NYSDEC[3] (No. of Wetlands Under NYSDEC Jurisdiction) |
|---|---|---|---|
| 93.68 acres (237 wetlands) | 89.66 acres (201 wetlands) | 4.02 acres (36 wetlands) | 20.37 acres (10 wetlands) |

Notes:

1. Includes wetlands for which a surface water connection to traditional navigable waters was identified during field surveys. It is likely that these wetlands will be determined to be federally jurisdictional. The JD will be made by USACE.
2. These wetlands may not be federally jurisdictional. The jurisdictional determination will be made by USACE.
3. These wetlands are not currently under NYSDEC jurisdiction. Because of their size and/or hydrologic connection to mapped NYSDEC wetland SC-12 and SC-13, they may be determined to be under NYSDEC jurisdiction. The JD will be made by NYSDEC.

### 5.1.1 Generation Portion Wetlands

Two hundred wetlands were delineated in the Generation portion, totaling approximately 53.30 acres. One hundred and sixty-five of the wetlands, totaling approximately 50.9 acres are considered to likely fall under the jurisdiction of USACE and are subject to Section 404 permitting. These 165 wetlands have an obvious direct surface water connection to traditional navigable waters. The remaining 35 wetlands, totaling approximately 2.40 acres, have no obvious surface connections to traditional navigable waters and are assumed not to be federally jurisdictional. Additional information regarding each delineated wetland is included in Table 4 and the existing conditions mapping in Appendix G.

### 5.1.2 Transmission Portion Wetlands

Thirty-seven wetlands were delineated in Transmission portion, totaling approximately 40.38 acres. Thirty-six of the wetlands, totaling approximately 38.95 acres, are considered to likely fall under the jurisdiction of the USACE and are subject to Section 404 permitting. These 36 wetlands have an obvious direct surface water connection to traditional navigable waters. The remaining wetland, approximately 1.43 acres, has no obvious surface connections to traditional navigable waters, but is located within the mapped boundary of NYSDEC wetland SC-12. While assumed not to fall under USACE jurisdiction, this wetland is assumed to be under the jurisdiction of NYSDEC. Additional information regarding each delineated wetland is included in Table 5 and the existing conditions mappin*g* in Appendix G

### 5.1.3 NYSDEC Wetlands

There are 10 mapped wetlands, totaling approximately 20.37 acres, located within the Survey Corridor, that are assumed to be under the jurisdiction of NYSDEC. All 10 of these wetlands are located within the Transmission Section of the Project Area. Nine of these wetlands (SVC22-W59, WVC22-W60, SVC23-W61/SVC18-61a, SVC23-W62 SVC23-W63, SVC23-W64, SVC23-W65 SVC18-W110, and SVC10-W111), totaling approximately 10.39 acres, are located within or associated with a mapped NYSDEC wetland. One wetland (WNC43-W104) is assumed to be under the jurisdiction of NYSDEC since it appears to be larger than 12.4 acres, of which 9.98 acres were delineated within the survey corridor. See Table 6 for a summary of the delineated wetlands within and/or associated with a mapped NYSDEC wetland and the wetland assumed to be under the jurisdiction of NYSDEC based on acreage.

### 5.1.4 Wetland Habitat

Several wetland community types exist within the Survey Corridor. During surveys, wetland community type was recorded using the Cowardin classification system (Cowardin et al. 1979). The classification assigned to each wetland at the time of the field surveys is included in the Summary of Wetland Characteristics included as Tables 4, 5, and 6. In order to provide a better assessment of wetland habitat within the Survey Corridor, the survey information was reviewed subsequent to the completion of field work, and descriptions of the wetland communities were written based on the classification system presented in Edinger et al. (2002). Based on field observations and the classification system presented in Edinger et al. (2002), six general palustrine and lacustrine (wetland) communities were identified in the Survey Corridor: deep emergent marsh, shallow emergent marsh, shrub swamps, red maple hardwood swamp, hemlock-hardwood swamp, and artificial ponds. Additionally, a rich hemlock hardwood peat swamp was identified within the Project Area, but outside of the survey corridor, in the southwest corner of the Project Area. A detailed description of vegetation associated with each community type, as observed during field surveys, is provided be-

low. These descriptions are listed by the Cowardin classification used during field surveys for the specific wetland type.

### Palustrine Emergent Wetland (PEM)

Wetlands classified as under the Cowardin system as PEM wetlands are dominated by herbaceous vegetation with little or no woody plant material present. These are further described using the classification system presented in Edinger as either Deep Emergent Marshes or Shallow Emergent Marshes.

**Deep Emergent Marshes** (PEM)
Rank: (G5) (S5)
Status: Secure

**Description.** According to Edinger et al. (2002), these marshes occur on mineral soil or fine-grained organic soils and have less than 50% canopy cover. These marshes have standing water that fluctuates seasonally, but is persistent with substrate that is almost always inundated.

**Distribution.** Some emergent wetlands with persistent inundation were scattered throughout the Survey Corridor.

**Vegetation.**

- **Overstory.** Trees found in surrounding forest communities may occur around the perimeter of the wetland, but are not included in the deep emergent marsh component of these wetlands.

- **Understory/Shrub Layers.** Hydrophytic understory or shrub species that were found to occur around the perimeter of the delineated deep emergent wetlands include American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), northern arrowwood (*Viburnum recognitum*) and willow species (*Salix* spp.).

- **Herbaceous Layers.** Emergent hydrophytes found in deep emergent marshes included jewelweed (*Impatiens capensis*), larger blue flag (*Iris versicolor*), fox sedge (*Carex vulpinoidea*), shallow sedge (*Carex lurida*), rice cutgrass (*Leersia oryzoides*), spikerush (*Eleocharis* spp.), duckweed (*Lemna valdiviana*), and cattail (*Typha latifolia*).

**Shallow Emergent Marshes** (PEM)
Rank: (G5) (S5)
Status: Secure

**Description.** These marshes occur on saturated mineral soils or deep muck soils. They are rarely inundated, but almost always saturated, and are more well drained

than deep emergent marshes. Standing water may disappear completely after the wet season.

**Distribution.** Shallow emergent marshes occur throughout the Survey Corridor in shrub/scrub and successional fields and in openings in forested areas.

**Vegetation.**

- **Overstory.** Tree species may occur around the perimeter of the wetland, but do not occur within the wetland boundary.

- **Understory/Shrub Layers.** If present, shrubs or saplings occur in isolated patches or individuals and include northern arrowwood, meadow-sweet (*Spiraea latifolia*), and willow.

- **Herbaceous Layers.** Herbaceous species in these wetlands vary throughout the Survey Corridor with the following species commonly appearing as dominants or co-dominants: sensitive fern (*Onoclea sensibilis*), jewelweed, rough stemmed goldenrod (*Solidago rugosa*), soft rush (*Juncus effuses*), fox sedge, fringed sedge (*Carex crinita*), shallow sedge, giant goldenrod (*Solidago gigantean*), false hellebore (*Veratrum viride*), woolgrass (*Scirpus cyperinus*), marsh marigold (*Caltha palustris*), horsetail (*Equestrium* spp.), and manna-grasses (*Glyceria* spp.).

### Palustrine Scrub-Shrub Wetland (PSS)

PSS wetlands are dominated by woody vegetation (i.e., trees or shrubs) less than 6 meters (20 feet) tall. Wetlands classified under the Cowardin system as PSS wetlands are further described using the classification system presented in Edinger as scrub-shrub swamps.

**Scrub-shrub Swamps** (PSS).
Rank: (G5) (S5)
Status: Secure

**Description.** These wetlands occur on mineral soil or muck and are variable in structure and distribution. They can be found lake and/or stream side, in transitional areas between forest and open land, and in isolated depressional areas.

**Distribution.** These wetlands are found throughout the Survey Corridor typically along agricultural ditches or serving as stream riparian areas. These wetlands are also commonly found in conjunction with emergent and/or forested wetland areas as a component of wetlands with more than one vegetative community.

**Vegetation.**

- **Overstory.** Tree species may occur around the perimeter of the wetland but do not occur within the boundary of a shrub scrub wetland.

- **Understory/Shrub Layers.** The dominant shrub found on the Project Area was northern arrowwood. Less common shrub species included willow, dogwood (*Cornus spp*.), spicebush (*Lindera benzoin*), and meadow-sweet.

- **Herbaceous Layers.** Herbaceous and emergent species are less dominant than shrub species and include mannagrasses, soft rush, and rough stemmed goldenrod.

### Palustrine Forested Wetland (PFO)

PFO wetlands are dominated by deciduous tree species, which lose their leaves during the cold season or by a mix of broad-leaved deciduous and needle-leaved evergreen trees. These are further described using the classification system presented in Edinger as either red maple-hardwood swamps or hemlock-hardwood swamps.

**Red Maple-Hardwood Swamp** (Palustrine Broad Leaved Deciduous Forested Wetland)
Rank: (G5) (S4) (S5)
Status: Secure

**Description.** This wetland community is a hardwood swamp that occurs in poorly drained depressions, usually on inorganic soils. Red maple is either a dominant or co-dominant species in these swamps in the Survey Corridor.

**Distribution.** Most forested wetland communities found within the Survey Corridor are red maple-hardwood swamps. These communities occur in beech-maple, successional northern hardwood, and hemlock-northern hardwood forests throughout the Survey Corridor.

**Vegetation.**

- **Overstory.** Red maple (*Acer rubrum*) is usually the dominant species. Other co-dominants and common overstory trees include green ash, and American elm.

- **Understory/Shrub Layers.** The shrub layer, when present, is dominated by saplings of overstory species, northern arrowwood, and willow.

- **Herbaceous Layers.** Dominant species include jewelweed, sensitive fern, and fringe sedge. Other common species include false hellebore, mannagrasses, and other sedges (*Carex* spp.).

### Hemlock-Hardwood Swamp (Palustrine Eastern Hemlock Forested Wetland)

Rank: (G4) (G5) (S4)
Status: Secure

**Description.** These closed canopy swamps occur on mineral soils and deep muck in depressions within hemlock-northern hardwood forests. They typically receive groundwater discharge and have no surface water connection. Species diversity is usually poor with few shrub and herbaceous species growing beneath the canopy.

**Distribution.** Hemlock-hardwood swamps were observed within hemlock-northern hardwood communities in the Survey Corridor. These wetlands occurred in depressions and hummocky areas in higher elevations.

**Vegetation.**

- **Overstory.** Eastern hemlock (*Tsuga canadensis*) is the dominant species in these wetlands. Common species include yellow birch (*Betula alleghaniensis*) and red maple.

- **Understory/Shrub Layers.** The understory is composed primarily of saplings of overstory trees, spicebush, and striped maple (*Acer pensylvanicum*).

- **Herbaceous Layers.** Skunk cabbage (*Symplocarpus foetidus*) and wood fern (*Dryopteris* spp.) are dominant. Ostrich fern (*Matteuccia struthiopteris*) was also common in canopy openings.

### Artificial Ponds (Lacustrine Emergent Wetland)

Rank: (G5) (S5)
Status: Secure

**Description.** These man-made ponds are constructed in farm fields, residential, or recreational properties for agricultural, recreational, or aesthetic purposes. They could potentially be stocked with fish and contain little or no aquatic vegetation.

**Distribution.** Artificial ponds occur throughout the Survey Corridor.

**Vegetation.**

- **Overstory.** There is no overstory vegetation.

- **Understory/Shrub Layers.** There is no understory/shrub vegetation.

- **Herbaceous Layers.** When vegetation is present it is typically in monotypic stands of aquatic plants, predominantly cattail.

### 5.1.5 Wetland Functions and Values

This section provides a listing of the general functions and values of the wetlands in the Survey Corridor based on the USACE *Highway Methodology Workbook for Wetland Functions and Values: A Descriptive Approach 1999*. The 13 functions and values that are considered are listed below.

1. Ground Water Recharge/Discharge
2. Floodflow Alteration
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
9. Recreation
10. Educational/Scientific Value
11. Uniqueness/Heritage
12. Visual Quality/Aesthetics
13. Threatened or Endangered Species Habitat

#### Evaluation of Wetland Functions

**Groundwater Recharge/Discharge.** This function considers the potential for a wetland to serve as a groundwater recharge/discharge area. The Project Area is characterized by rolling topography comprised predominantly of glaciated till and silty soils, and it encompasses two primary watersheds. The majority of the wetlands delineated in the Survey Corridor have a direct surface hydrologic connection to these watersheds. Many of these wetlands are found on hillsides and receive water from groundwater discharges (seeps) or from drained agricultural fields. Although these wetlands are hydrologically connected to traditional navigable waterways, they are also effective in holding surface water runoff for groundwater recharge. Wetlands having no apparent surface hydrologic connection occur as small natural depressions in agricultural fields and in forested areas, in some cases resulting from impacted soils rutted by logging operations. These wetlands are all areas of groundwater recharge.

**Floodflow Alteration.** This function considers the effectiveness of a wetland in reducing flood damage by water retention for prolonged periods following precipitation events. Floodflow alteration is a primary function of those wetlands associated with watercourses and their tributaries. All wetlands found within the Survey Corridor serve this function to some degree by attenuating runoff; however, this is a secondary function for smaller wetlands located higher in the watershed.

**Fish and Shellfish Habitat.** This function considers the effectiveness of seasonal watercourses or permanent waterbodies associated with wetlands for fish habitat. Few wetlands delineated within the Generation portion of the Survey Corridor had a direct hydrologic connection to stream corridors classified as trout streams by NYSDEC. However, within the Transmission portion of the Survey Corridor, multiple wetlands were delineated in and with direct hydrologic connections to stream corridors that are classified as trout streams by NYSDEC. Although the wetlands are not trout habitat, they contribute to the health of the stream resource. The wetlands adjacent to stream channels play an important role in the dynamics of the stream itself. They provide a floodplain for the channel during high flows and the vegetation provides roughness to slow down water velocities allowing sediment to settle out of suspension. The sediment retention function of the wetland adjacent to the stream is important to prevent the degradation of spawning habitat. These wetlands may also play a role in maintaining a cool, constant water temperature in the watercourse. Groundwater slowly and regularly discharges into the channel from these wetlands. Where present, overhead vegetation shades the open channel and is the basis of the food chain for the stream below. Insect and other invertebrate production is linked to the vegetation found in the vicinity of these streams. Wetlands and stream associations are listed in Tables 4 and 5. Stream classifications are listed in Tables 7 and 8.

**Sediment/Toxicant/Pathogen Retention.** This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediment, toxicants, or pathogens in runoff from surrounding uplands or upstream-eroding wetland areas. Numerous wetlands within the Survey Corridor receive runoff from natural or man-made drainages in adjacent agricultural fields or from seeps or surface runoff on slopes and perform this function very effectively.

**Nutrient Removal/Retention/Transformation.** This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands, and the ability of the wetland to process these nutrients into other forms or trophic levels. Many of the wetlands found adjacent to agricultural fields or in watercourses perform this function very effectively.

**Production Export.** This function evaluates the effectiveness of the wetland to produce food or usable products for man or other living organisms. While most of the wetlands delineated provide some level of food for wildlife, the majority of the wetlands are small and do not provide a significant export. The greatest export production within the Project Area is provided by large wetlands, with diverse communities or vegetation, associated with streams. These wetlands are located outside of the Survey Corridor.

**Sediment/Shoreline Stabilization.** This function considers the effectiveness of a wetland to stabilize stream banks and shorelines against erosion. This is an im-

portant function of wetlands within the Survey Corridor that are associated with watercourses.

**Wildlife Habitat.** This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with a wetland and/or the wetland edge. The majority of the Survey Corridor is comprised of old field/shrub, forested communities, and agricultural land. Wetlands, in association with these upland communities, serve as habitat for a broad range of amphibians, small mammals (e.g., mice, moles, and voles), songbirds, and larger mammals (e.g., beaver, coyote, and white-tailed deer).

**Recreation.** This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities. Deer hunting is a primary recreational activity conducted in this area. Fishing is also conducted on sections of the Sixtown Creek and in other streams within the Project Area; however, these stream sections are located outside the Survey Corridor. These values are primarily associated with the streams or surrounding upland habitats rather than with the wetlands.

**Educational/Scientific Value.** This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research. The wetlands are located on private property that is not within or near any educational facility nor are there any wetlands of unique scientific value within the Survey Corridor.

**Uniqueness/Heritage.** This value considers the effectiveness of the wetland or associated waterbodies to provide certain special values. The wetlands in the Survey Corridor are generally small or moderate in size, are predominantly emergent and scrub-shrub wetlands, generally are not associated with open water components, and are located in a rural community not subjected to development pressure. The majority of the wetlands offer no unique viewing opportunities or other cultural values.

**Visual Quality/Aesthetics.** This value considers the visual and aesthetic quality or usefulness of the wetland. The wetlands in the Survey Corridor offer no unique viewing opportunities.

**Threatened or Endangered Species Habitat.** All endangered species issues related to this Project are addressed in the DEIS. Endangered or threatened plant and wildlife species are not known to occur within the wetlands. The wetlands and uplands in the Survey Corridor were dominated by plant communities typical of this region of New York.

## 5.2 Waterbodies

Table 7 provides a description of each perennial, intermittent, or ephemeral stream that was identified within the Generation Portion of the Survey Corridor

during field surveys. Table 8 provides a description of each perennial, intermittent, or ephemeral stream that was identified within transmission portion of the Survey Corridor. The streams range from well-defined stream channels to poorly defined headwater channels. The locations of these streams are depicted in relation to Project facilities on the mapping included for each sector in Appendix G.

In addition, numerous hydrologic features were delineated within the Survey Corridor and are depicted on the wetland mapping as drains. These drains include features that appear to be man-made ditches (typically for agricultural use), small swales, and natural drains which lack a defined bed and bank. These features have been identified in order to characterize the hydrology of the Survey Corridor and in many cases to document the hydrologic connection or lack of connection between delineated wetlands and traditional navigable waters.

Throughout the Project Area there are 57 unnamed tributaries to North Branch Conewango, West Branch Conewango Creek, Tupper Creek, Walnut Creek, and Silver Creek; 27 are Class C streams, 7 are Class C(t) streams, and 24 are Class A streams.

### 5.2.1 Generation Streams

Forty-four streams were identified in the Generation portion of the Survey Corridor. Streams in the Generation portion of the Survey Corridor are Class A protected streams or Class C streams. See Table 7 for a summary of streams delineated within the Generation portion of the survey corridor.

### 5.2.2 Transmission Streams

Thirteen streams were identified during field surveys in Transmission Portion of the Survey Corridor. Seven of these streams are protected and classified as Class C(t) streams (Streams WNC103-S54, WNC103-S54a, WNC103-S56, WNC103-S56a, SVC23-S60, WNC28-S1014, and WNC28-S1014a). There are also six class C streams (WNC30-S50, WNC47-S103, TUC6-S108, WNC87-S607, WNC92-S607a, and WNC47-S2000). See Table 8 for a summary of streams delineated within the transmission portion of the survey corridor.

### 5.2.3 Surface Water Use

Surface water features in the Survey Corridor are utilized for drinking water, recreational, wildlife, and agricultural uses.

The Class A streams in the Project Area are those streams tributary to Silver Creek. Upper and Lower Silver Creek Reservoirs are the source of drinking water for Hanover Water Districts No. 1 and No. 2 in the Village of Silver Creek, approximately 5 miles north of the Project Area (USEPA 2008). Refer to Section 2.5, Water Quality: Existing Conditions, of the DEIS for further information regarding drinking water sources.

Perennial streams that have been classified for fishing in the vicinity of the Survey Corridor may provide fishing opportunities for the public. Public access is available along West Branch Conewango Creek and steelhead (trout) fishing is available with owner's permission along segments classified as C(t) on Walnut Creek and Silver Creek. None of the major waterbodies within these watersheds would be traversed by the Project, and these creeks lie primarily outside of the Project Area (NYSDEC 2008c and 2008d). A portion of the streams within the Survey Corridor are tributary to one of these stream systems.

All of the streams within the Survey Corridor may be used to some extent by wildlife and livestock as a source of drinking water. However, many of the streams, including protected streams classified as C(t) and A are intermittent or ephemeral; therefore, water availability is intermittent and may be present only during periods of continuous or heavy precipitation or during the snowmelt period in the spring. Furthermore, the conditions in these streams are usually unsuitable for fish species. This includes all of the streams in the Survey Corridor except perennial Class A, C and C(t) streams, which consists of 27 streams in the Generation portion and 10 streams in the Transmission portion of the Survey Corridor. However, amphibians and macro-invertebrates are likely to inhabit intermittent streams when water is present.

Natural and man-made ponds are scattered throughout the Survey Corridor. Ponds vary in size, but are typically less than 1 acre with depths ranging from 2 to 10 feet. Natural ponds exist in both forests and fields and in some cases result from beaver activity. Man-made ponds used for agricultural purposes are located in farm fields, and recreational ponds are located in open or forested residential areas and private camping areas. Wildlife may also utilize these resources.

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sector A** | | | | | | | | | | | |
| **Cluster 1 (Turbines T1, T2 and T3)** | | | | | | | | | | | |
| WBC29-W78 | W78 | PEM/PSS | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC29 | 27.11 | 0.24 | | Small, moderate value PEM/PSS wetland with moderate vegetative diversity, associated a drainage swale between two agricultural fields in the hedgerow of an east sloping hillside. (P446, P447) Receives surface water runoff from up-gradient adjacent agricultural fields and drains east to the roadside ditch. Ulitmately to an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge and discharge, and toxicant filtration function and values. | A-2 |
| WBC29-W79 | W79 | PEM | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC29 | 27.11 | 0.08 | | Small, low value PEM wetland with little vegetative diversity, located in active agricultural field associated with farm machinery ruts. (P448) Receives surface water runoff from up-gradient areas and drains northeast via overland flow to wetland W78 which flows to an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge and discharge function and value. | A-2 |
| WBC33-W80 | W80 | PEM/PSS | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC33 | 65.32 | 0.26 | | Moderate size and value PSS/PEM with moderate vegetative diversity on a west sloping hillside. Receives surface water runoff near wetland flag W80-1 (P453, P454) and groundwater seep near wetland flag W80-12. Drains to the west to stream S81 via discrete overland flow from wetland flag W80-11, drain D80 (near wetland flag W80-4), and drain D80a. | A-1 |
| WBC33-W81 | W81 | PEM | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC33 | 65.32 | 0.11 | | Moderate size and value riparian PEM wetland with moderate vegetative diversity, associated with stream S81 (P455, P456). Receives inflow and outflow via stream S81, an unnamed tributary to West Branch Conewango Creek. | A-1 |
| WBC33-W82 | W82 | PSS/PFO | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC33 | 65.32 | 0.58 | | Moderate size and value PSS/PFO wetland, with moderate vegetative diversity, located on southwest sloping hillside. Receives surface water runoff from up-gradient areas, drains D82 and D82a, and from wetland W80 via drains D80, D80a, and D80b. Abuts to stream S81 where drain D82 enters the stream (between points W82-3 and D82-3. | A-1 |
| WBC28-W83 | W83 | PEM/PSS | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC21 | 63.04 | 0.26 | | Moderately size and value PEM/PSS, with moderate vegetative diversity associated with stream S83.(P480) Up-gradient of wetland flag W83-16 primarily PSS while down-gradient side primarily PEM. Water drains down-gradient to the southwest. Stream and wetland continue beyond the survey corridor (P476, P477) to an unnamed tributary to West Branch Conewango Creek. | A-1 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC131-W84 | W84 | PFO | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC131 | 29.81 | 0.21 | | Moderate size and wildlife habitat value PFO1 wetland with moderate vegetative diversity. (P472, P473) Associated with inundated logging roads (P474) in upland forest on slightly northwest sloping hillside. Based on landscape position it is assumed to drain to the northwest to an unnamed tributary to West Branch Conewango Creek. | A-1 |
| WBC33-W85 | W85 | PEM | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC33 | 65.32 | 0.06 | | Small, low value PEM, with little vegetative diversity, located in a maintained field. (P481) Receives surface water (up-gradient) and water from small groundwater seeps. Drains west into drain D85 beyond wetland boundary and reverts to overland flow to stream S81. | A-1 and A-2 |
| WBC46-W86 | W86 | PEM | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC46 | 67.17 | 0.14 | | Moderate size and value riparian wetland, with moderate vegetative diversity, associated with S86 (P483, P484, P485, P486). Moderate wildlife habitat, and groundwater recharge/discharge. Continues west beyond survey corridor to unnamed tributary to West Branch Conewango Creek. | A-2 |
| WBC46-W87 | W87 | PSS | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC46 | 67.17 | 0.03 | | Small, low value PSS with little vegetative diversity; associated depression adjacent to gas well, probable remains of drilling pond for well. Receives surface water runoff via drain D87-1a to -1b . Drains south to stream S86 via D87 (P487, P488). Low groundwater recharge/discharge due to high clay soil. | A-2 |
| WBC33-W88 | W88 | PEM | Sector A/Cluster 1 (Turbines T1, T2 and T3) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC33 | 65.32 | 0.04 | | Mapped portion is the west edge of a small, moderate value, PEM wetland with little vegetative diversity, associated with a linear natural depression in a maintained field. Moderate groundwater recharge/discharge function and value. Drains west via discrete overland flow during high water events to stream S81 (P493, P494). | A-2 |
| **Cluster 2 (Turbine T4)** | | | | | | | | | | | |
| WBC46-W91 | W91 | PSS | Sector A/Cluster 2 (Turbine 4) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC46 | 67.17 | 0.32 | | Moderate size, high value inundated PSS wetland, with moderate vegetative diversity, located adjacent to reverting field. (P1500, P1502) Receives surface water run-off from upgradient areas (P1503) (very wet 6-8 inches of inundation from only surface water inflow). Drains north via drain or discrete overland flow (P1501) to unnamed tributary to West Branch Conewango Creek beyond corridor. High groundwater recharge/discharge and wildlife habitat function and values. | A-3 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cluster 3 (Turbines T5 and T6)** | | | | | | | | | | | |
| WBC77-W74 | W74 | PEM/PSS/PFO | Sector A/Cluster 3 (Turbines T5 and T6) | Unnamed tributary to West Branch Conewango | Adjacent with surface connection | WBC77 | 54.87 | 0.78 | | Moderate size, moderate to high value PSS wetland with high vegetative value, located within forested area including a PEM component.(P445) Also contains ruts from farm equipment within the area between the PSS/PFO and PEM portion of the wetland (P420, P424). Located on top of an inundated west sloping hillside within an active cow pasture. Moderate wildlife habitat and high groundwater recharge and discharge function and value. Drains to the west to the PEM portion via overland sheet flow (P421) and then on to the southwest to an unnamed tributary to West Branch ConewangoCreek. | A-4 |
| WBC77-W75 | W75 | PEM | Sector A/Cluster 3 (Turbines T5 and T6) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC77 | 54.87 | 0.02 | | Small, moderate value riparian PEM wetland with low vegetative diversity, located within the banks of stream S75.(P422, P423, P432) Also receives inflow via groundwater seep between wetland flags W75-1 and W75-5. Outflow via S75, an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge and discharge function and value. | A-4 |
| WBC77-W76 | W76 | PEM | Sector A/Cluster 3 (Turbines T5 and T6) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC77 | 54.87 | 0.03 | | Small, low value PEM wetland with little vegetative diversity, associated with a drainage swale (Drain D76) that drains north into stream S75. (P438, P439, P440) Receives surface water runoff from the east. Low groundwater recharge and discharge, or amphibian habitat function and values. | A-4 and A-5 |
| **Sector A Collection Line** | | | | | | | | | | | |
| **WBC77-W74--See Sector A Cluster 3** | | | | | | | | | | | |
| WBC72-W77 | W77 | PSS | Sector A Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC72 | 114.67 | 0.10 | | Small, low value, linear PSS associated a drainage swale between an agricultural field and a residence. (P443) Receives surface water runoff from up-gradient areas and drains east to the roadside ditch (P444), ultimately drains to an unnamed tributary to West Branch Conewango Creek. Low wildlife habitat function and values, with some toxicant filtration function and value. | A-5 |
| WBC38-W89 | W89 | PEM/PSS | Sector A Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC38 | 42.34 | 0.38 | | Moderate size and value PEM/PSS wetland with moderate vegetative diversity; located on a northeast sloping hillside.(P496) Receives up-gradient surface water run-off and water via drain D89 (P495). Drains to roadside ditch (P497) and then to unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge/discharge and wildlife habitat functions and values. | A-2 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC46-W90 | W90 | PSS/PFO | Sector A Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC46 | 67.17 | 0.45 | | Moderate size and value PSS/PFO1 wetland with moderate vegetative value, located on slight northwest sloping hill.(P498, P499) Receives water via drain D90 from road culvert outflow which widens into multiple small drainage channels down gradient from the culvert. Drains northwest beyond survey corridor to unnamed tributary to West Branch Conewango Creek. Moderate wildlife habitat and groundwater recharge/discharge functions and values. | A-3 |
| **Sector B** | | | | | | | | | | | |
| **Cluster 4 (Turbine T7)** | | | | | | | | | | | |
| WBC72-W92 | W92 | PEM/PSS | Sector B/Cluster 4 (Turbine T7) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC72 | 114.67 | 0.55 | | Moderate size, and value PSS wetland with some PEM riparian components (P1509, P1511, P1512)), with moderate vegetative diversity; located on a north sloping hillside. Drains north into the channelized stream S92 (P1510), and unnamed tributary to West Branch Conewango Creek. | B-1 |
| **Cluster 5 (Turbines T8, T9 and T15)** | | | | | | | | | | | |
| WBC72-W93 | W93 | PEM/PSS | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC72 | 114.67 | 0.25 | | Small, low to moderate value, PSS wetland with PEM component along logging road, with low to moderate vegetative diversity. (P1517, P1518) Located on north down sloping topography. Drains to the north to drain D1020 along the southern edge of the woods. Inundated logging roads drain to agricultural ditch D1020 which then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast. | B-2 |
| WBC72-W94 | W94 | PSS | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC72 | 114.67 | 0.02 | | Moderate size and value, inundated PSS depressional wetland, with low vegetative diversity. (P1519) Appears to flow north via overland flow across upland areas when full to agricultural ditch D1020. D1020 then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast. Moderate to low wildlife habitat value and moderate water quality and groundwater discharge and recharge function and values. | B-2 |

G-60

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC72-W95 | W95 | PSS | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewago Creek | Adjacent with surface connection | WBC72 | 114.67 | 0.06 | | Small, moderate value, linear PSS wetland, with low vegetative diversity. (P1520, P1521)Receives water from a wet logging road from the south and drains into agricultural ditch D1020 to the north. Agricultural ditch D1020 then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast. Moderate to low wildlife habitat value. Moderate water quality and groundwater discharge and recharge function and values due to agricultural ditch. | B-2 |
| WBC72-W96 | W96 | PEM | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC72 | 114.67 | 0.22 | | Moderate size open PEM with low to moderate vegetative diversity and wildlife habitat value. (P1522, P1523) Water from up-gradient logging road in southwest corner of the wetland drains north to drain D1020. Agricultural ditch D1020 then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast. | B-2 |
| WBC80-W97 | W97 | PEM | Sector B/Cluster 5 (Turbines T8, T9 and T15) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC80 | 61.98 | 0.00 | | Small, low value depressional PEM wetland with little vegetative diversity; located on the edge of a maintained yard. Inflow from surrounding up-gradient areas. Outflow to north to drain D1020. At this location drain D1020 will not lead anywhere. Water from the in the drain will not cross the agricultural field as surface water except during the most extreme rain events. Therefore this wetland is does not connect to tradition navigable waters of the US. | B-3 |
| WBC88-W98 | W98 | PSS/PFO | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC88 | 53.95 | 1.06 | | Large, moderate value PSS wetland within a PFO wetland with moderate vegetative diversity. (P1530, P1531) Receives water from up-gradient reverting agricultural field to the north. Drains to the south into stream S98, an unnamed tributary to West Branch Conewango Creek. | B-4 |
| WBC83-W99 | W99 | PEM | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC83 | 67.22 | 0.32 | | Large, high value NWI mapped wetland with moderate vegetative diversity. (P1542, P1543) High wildlife habitat and groundwater recharge and discharge function and values. Inflow from up-gradient agricultural field to south and flows northeast to an unnamed tributary to West Branch Conewango Creek. | B-2 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC88-W100 | W100 | PEM | Sector B/Cluster 5 (Turbines T8, T9 and T15) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC88 | 53.95 | 0.53 | | Medium size PEM wetland with moderate vegetative diversity, wildlife habitat, and groundwater recharge/discharge functions and values.(P1544) Located on a slightly west sloping hillside. Receives water from west side of wetland corridor, culvert drains through and out into stream S98 (P1545) on east side of corridor. Ultimately reaching an unnamed tributary to West Branch Conewango Creek. | B-4 |
| WBC80-PO1 | PO1 | POND | Sector B/Cluster 5 (Turbines T8, T9 and T15) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC80 | 61.98 | | 0.05 | Small, pond located upgradient from Wetland W97. | B-3 |
| **Cluster 6 (Turbines T11, T13 and T14)** | | | | | | | | | | | |
| WBC101-W101(a,b) | W101, W10 | PEM/PSS | Sector B/Cluster 6 (Turbines T11, T13 and T14) | Unnamed tributary to West Branch Conewango Creek | Abutting/Adjacent with surface connection | WBC101 | 37.12 | 0.86 | | Large, moderate value PSS depressional wetland, with little vegetative diversity. (P1550, P1551) Wetland associated with stream S101 and multiple drainage patterns. Receives water via S101 and outlet via S101 and several drains, to an unnamed tributary to West Branch Conewango Creek. Wetland W101a is a small, moderate value PEM wetland with moderate vegetative diversity, (P1598) entering survey corridor from west.Drain D101(P1597) flows northeast along southern boundary of wetland, becoming stream S101 northeast of wetland boundary. Wetland receives water via drain D101 (P1599) from southwest and overland flow from north, south and west. Discharges via surface runoff and D101 to S101 to the northeast. W101b (P1595, P1596) receives surface water runoff via drain D101b and drains north via D101b. | B-5 and B-6 |
| WBC97-W102 | W102 | PFO 1/4 | Sector B/Cluster 6 (Turbines T11, T13 and T14) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC97 | 85.09 | 2.91 | | Moderate size and value, PFO characterized by pit and mound topography, with moderate-low vegetative diversity. (P1557, P1558) Drains northwest outside of corridor area, assumed to an unnamed tributary to West Branch Conewango Creek. | B-5 |
| WBC101-W112 | W112 | PEM in Forested area | Sector B/Cluster 6 (Turbines T11, T13 and T14) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC101 | 37.12 | 0.21 | | Moderate size, high value, PEM wetland with high vegetative diversity, located in upland forest. (P1602) Mapped portion of wetland begins as a riparian wetland within stream S101a and extends north northeast beyond survey corridor to a larger wetland complex. Drain D112 and D112a (P1604, P1605) branch off from S101a (P1601, P1603) through apple trees and provide hydrology for abundant vegetation. Both drains reach larger wetland complex during high rain events. | B-5 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC97-W113 | W113 | PFO 1/4 | Sector B/Cluster 6 (Turbines T11, T13 and T14) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC97 | 85.09 | 0.59 | | Large, moderate value, PFO 1/4 wetland with emergent understory, with high vegetative diversity. (P1610, P1611, P1612, P1613) Receives water via surface runoff and through groundwater seeps (Drains D113, D113a, D113b) from upland hillside to the west. Drains via overland flow to the east towards stream S602 outside of corridor, as well as reverting to groundwater. | B-5 |
| **Cluster 7 (Turbine T16 and T17)** | | | | | | | | | | | |
| WBC103-W603 | W603 | PEM | Sector B/Cluster 7 (Turbine T16 and T17) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC103 | 200.68 | 0.04 | | Small, low value PEM wetland with little vegetative diversity.(P981) Wetland is depressional and possibly manmade from vehicle. Wetland likely flows southeast via discrete overland flow to S1535, an unnamed tributary to West Branch Conewongo Creek. | B-9 |
| WBC103-W700 | W700 | PEM | Sector B/Cluster 7 (Turbine T16 and T17) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC103 | 200.68 | 0.18 | | Small, moderate value PEM wetland with little vegetative diversity, resulting from a groundwater seep at the edge of a forested area. (P2000, P2001, P2002) Drains northeast via drain D700 and discrete overland flow across open field, ultimately reaching stream S602, an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge/discharge functions and values. | B-7 |
| **Cluster 8 (Turbine T68)** | | | | | | | | | | | |
| WBC100-W116 | W116 | PFO | Sector B/Cluster 8 (Turbine T68) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC 100 | 108.94 | 0.22 | | Moderate size and value PFO wetland with moderate vegetative diversity, located near top of hill. (P1628, P1629, P1631, P1633, P1634) Receives water via surface water runoff and drain D116 from upgradient agricultural fields near wetland W116-3, W116-11 and W116-14. Slopes northwest draining into drain D116 (P1630, P1632), which drains north to unnamed tributary to West Branch Conewango Creek, beyond survey corridor. Moderate groundwater recharge/discharge and sediment/toxicant retention function and value. | B-8 |
| **Cluster 9 (Turbines T18, T19, T20 and T21)** | | | | | | | | | | | |
| WBC52-W115 | W115 | PEM | Sector B/Cluster 9 (Turbines T18, T19, T20 and T21) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC52 | 33.78 | 0.03 | | Small, low value PEM with little vegetative diversity, associated with agricultural drainage swale. Receives water via drain tile from up-gradient agricultural field southeast of wetland W115-1 and from surrounding area runoff. Drains south and west via drain D115 (P1616, P1617) (beyond survey corridor) to an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge/discharge and sediment/toxicant retention function and values. | B-11 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC52-W595 | W595 | PEM | Sector B/Cluster 9 (Turbines T18, T19, T20 and T21) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC52 | 33.78 | 0.06 | | Small to moderate size, low value depressional PEM wetland, with little vegetative diversity.(P930, P931) Receives inflow via surface flow from north. Outflow via confined/discrete flow to stream S98, an unnamed tributary to West Branch Conewango Creek, outside of corridor. | B-11 |
| WBC56-W596 | W596 | PEM | Sector B/Cluster 9 (Turbines T18, T19, T20 and T21) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC56 | 75.30 | 0.28 | | Small to moderate size, low value, depressional PEM wetland, with little vegetative diversity, (P936, P937) located within drainage that runs perpendicular across access road. Runoff from upland inactive field/pasture running east to west. Ultimately drains to unnamed tributary to West Branch Conewango Creek. | B-12 |
| **Sector B Collection Line** | | | | | | | | | | | |
| WBC108-W114 | W114 | PEM/PSS | Sector B Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC108 | 23.48 | 0.19 | | Small, low value, linear PEM/PSS wetland with little vegetative diversity. (P1614) Associated with a natural swale in a shrub field. Receives water via surface water runoff and from drain D114 inflow at north and south ends. No outlets observed. | B-6 |
| WBC90-W597 | W597 | PEM | Sector B Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC90 | 70.41 | 0.03 | | Wetland moderate size and value depressional PEM wetland with little vegetative diversity. (P951, P952) Located in an inactive corner of an agricultural field. Receives inflow from north overland flow. Moderate amphibian habitat. No outlets observed. | B-10 |
| WBC90-W598 | W598 | PEM | Sector B Collection Line | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC90 | 70.41 | 0.06 | | Small to moderate sized, low value depressional PEM wetland (P956) located within stream 598 floodplain (P957). Inflow and outflow via S598, an unnamed tributary to West Branch Conewango Creek. | B-10 |
| WBC90-W599 | W599 | PEM in Forested area | Sector B Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC90 | 70.41 | 0.04 | | Small to moderate, low value, depressional PEM wetland with little vegetative diversity, located in forested area. (P959) Determination is a wetland based on hydrology and soils, although there is no vegetation to support. No outlets observed. | B-9 |
| WBC90-W600 | W600 | PEM in Forested area | Sector B Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC90 | 70.41 | 0.19 | | Large, low value, PEM wetland with little vegetative diversity, located in forested area. (P960) Wetland is located in depressional areas between hummocks. Collect water from surrounding hemlock-hardwood forest, supporting saturated conditions. Outflow likely to north to unnamed tributary to West Branch Conewango Creek. | B-9 |
| WBC90-W601 | W601 | PEM in Forested area | Sector B Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC90 | 70.41 | 0.11 | | Moderate to large size, low value, PEM wetland with little vegetative diversity, located in a drainage area in forested area. (P962, P963) No outlets observed. | B-9 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC103-W602 | W602 | PEM | Sector B Collection Line | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC103 | 200.68 | 0.02 | | Small, low value riparian PEM, with little vegetative diversity. (P967) Receives inflow and outflow via stream S602, an unnamed tributary to West Branch Conewango Creek. | B-9 |
| WBC108-W604 | W604 | PEM/PSS | Sector B Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC108 | 23.48 | 0.34 | | Very large, moderate value PEM/PSS wetland with moderate vegetative diversity. (P990, P991) Connects to culvert inflows and outflows into an unnamed tributary to West Branch Conewango Creek. | B-7 |
| **Sector C** | | | | | | | | | | | |
| **Cluster 10 (Turbine T25)** | | | | | | | | | | | |
| WBC130-W525 | W525 | PEM | Sector C/Cluster 10 (Turbine T25) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC130 | 16.04 | 0.05 | | Small, moderate value PEM wetland, with high to moderate vegetative diversity. (P603, P604) Located at bottom of hill east of Turbine 25. East side of wetland is bordered by stream S5000, and abuts stream S526 to the north. Drains to S526, ultimately to Unnamed tributary to West Branch Conewango Creek and retains toxins before reaching S526. | C-1 |
| WBC24-W526 | W526 | PEM/PSS | Sector C/Cluster 10 (Turbine T25) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC24 | 5.24 | 0.01 | | Small, moderate value PEM/PSS wetland, with moderate vegetative diversity. Located within Stream S526 (P607, P608). Moderate floodplain, habitat, toxicant retention value. Receives inflow via western slope runoff, outflow via Stream S526 to south, ultimately to Unnamed tributary to West Branch Conewango Creek. | C-1 |
| **Cluster 11 (Turbines T23 and T24)** | | | | | | | | | | | |
| WBC35-W522 | W522 | PEM | Sector C/Cluster 11 (Turbines T23 and T24) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC35 | 132.69 | 0.80 | | Wetland W522 is large PEM in a non-active agricultural field, with dominant plant Phalaris arundinacea. (P580, P581) Inflow from north via drain D522, and surface water runoff from the north and east. Inflow also from drain D522a from south. Connects with roadside ditch at culvert drainage (P582) under Pope Hill Road. Drainage (outside corridor) turns to a stream about 300 feet west of Pope Hill Road. This flows to an Unnamed tributary to West Branch Conewango Creek. Moderate value and diversity. May filter and/or retain some agricultural runoff that drains towards the stream referenced above. | C-2 and C-3 |
| WBC35-W562 | W562 | PEM | Sector C/Cluster 11 (Turbines T23 and T24) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC35 | 132.69 | 0.34 | | Large, moderate value PEM with 2 moderate sized willow shrubs, with high vegetative diversity, located with in an unused agricultural field. (P791, P792) Mixed vegetation (wet and upland) but small hummocky ground surface with intertwining tiny drains indicate long term saturated conditions. Topography slopes west to Pope Hill Road, where surface flow collects at culvert and drains west to tributary to West Branch Conewango Creek. | C-2 and C-3 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cluster 12 (Turbine T22)** | | | | | | | | | | | . |
| WBC128-W511 | W511 | PEM | Sector C/Cluster 12 (Turbine T22) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC128 | 26.89 | 0.06 | | Small to moderate size open water PEM in agricultural field with moderate vegetative diversity. (P544, P545) Vernal pool qualities, but no fauna species evident except one Spring Peeper (Pseudacris crucifer). Depressional area with no inflow observed, outflow to the Southwest via surface flow which returns to groundwater outside the corridor within about 300 ft. Isolated, Pope Hill Road prevents further surface flow to the Southwest. | C-4 and C-5 |
| WBC128-W512 | W512 | PEM | Sector C/Cluster 12 (Turbine T22) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC128 | 26.89 | 0.02 | | Small PEM abutting a pond that appears to have been dug where the wetland formerly extended. (P546) Low diversity but good open water habitat. Frogs observed. Inflow via surface runoff. Outflow to pond. No connection to any other waters observed. | C-5 |
| WBC128-PO512 | PO512 | POND | Sector C/Cluster 12 (Turbine T22) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC128 | 26.89 | | 0.05 | Small pond (P547, P548) with many frogs, tadpoles and small fish observed, including one black salamander. Receives water from W512 and overland runoff and no outlets observed. | C-5 |
| WBC10-W513 | W513 | PEM /PFO | Sector C/Cluster 12 (Turbine T22) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC10 | 37.00 | 0.09 | | Moderate size, high value PEM in forested area with Acer rubrum on hummocks, with high vegetative diversity.(P550, P551) Receives surface runoff from sloping field to the west. No outflow to streams observed, but surface flow during heavy rains flows west from Wetland W513 to Wetland W514, which drains via Drain D514 to Wetland W 515, which likely has surface connection to a Unnamed tributary to West Branch Conewango Creek. | C-5 |
| WBC10-W514 | W514 | PEM in Forested area | Sector C/Cluster 12 (Turbine T22) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC10 | 37.00 | 0.07 | | Moderate to large size, moderate value PEM, with moderate vegetative diversity, located downhill from a field at forest's edge.(P552, P553) Berm present in middle of wetland used for shooting range (P554) which affects quality of wetland. Some small Ulmus americana present within wetland. Part of wetland is slight depression. Inflow is from the east sloping field surface runoff and from wetland W513 during heavy rains. Outflow drains north via drain D514 towards a portion of wetland W515 outside the corridor. Likely drainage through W515 will lead to an Unnamed tributary to West Branch Conewango Creek. | C-5 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC10-W515 | W515 | PEM/PSS/PFO | Sector C/Cluster 12 (Turbine T22) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC10 | 37.00 | 0.79 | | Very large, high value mixed wetland, with high vegetative diversity (P557, P558, P559, P560), with existing farm road in the middle. Some inundated areas but mostly saturated, where tadpoles and amphibian eggs were observed (P556). Some large trees scattered throughout area. The wetland extends very far to the north and east outside the corridor. No inflow or outflow was observed but topography suggests some type of surface flow to the North to an unmapped stream outside the corridor, ultimately connecting to a unnamed tributary of West Branch Creek. | C-5 |
| **Cluster 13 (Turbine T26)** | | | | | | | | | | | |
| WBC23-W500 | W500 | PEM | Sector C/Cluster 13 (Turbine T26) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC23 | 168.28 | 0.14 | | Small, low value PEM with 2 salix discolor, with moderate vegetative diversity. (P501, P502, P503, P504) Receives water from east via cut drainage channel Drain D500 from farm building. No outlets observed. Wetland is likely isolated, but possible outflow to northwest during heavy rainfall. | C-7 |
| WBC23-W501 | W501 | PEM | Sector C/Cluster 13 (Turbine T26) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC3 | 168.28 | 0.02 | | Small, low value PEM with low vegetative value, located in middle of an active agricultural field. (P508) Wetland is a depressional area that received water via run-off primarily from the southeast. No outlets observed, however the wetland may flow out to the northwest during heavy rain events. | C-7 |
| WBC3-W502 | W502 | PEM | Sector C/Cluster 13 (Turbine T26) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC33 | 97.22 | 0.02 | | Small, low value PEM with low vegetative diversity.(P509) Wetland has little groundwater recharge value. Receives runoff from southeast. No outlets observed, however due to gentle topography that slopes to the northwest it is possible that runoff drains to the northwest in high rain events. | C-7 |
| WBC3-W503 | W503 | PEM | Sector C/Cluster 13 (Turbine T26) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC3 | 97.22 | 0.02 | | Small, low value PEM with low vegetative diversity and slight groundwater recharge value. (P511, P512) Wetland located within an active wetland with gentle slope to the northwest. Wetland receives water via adjacent hillside runoff mostly from the southeast. No outlets observed, however during heavy rain events could flow to the northwest. | C-7 |
| WBC3-W504 | W504 | PEM/PSS | Sector C/Cluster 13 (Turbine T26) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC3 | 97.22 | 0.03 | | Moderate size and value PEM/PSS with moderate vegetative diversity. (P513, P515) The wetland is mostly located outside the survey corridor in an active agricultural field. Wetland receives water via surface runoff from southeast. No outlets observed. | C-7 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC23-W505 | W505 | PEM | Sector C/Cluster 13 (Turbine T26) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC23 | 168.28 | 0.05 | | Small, low value PEM with low vegetative diversity, located within an active agricultural field. (P516, P517) Wetland receives water from southeast via runoff from adjacent hillside. No outlets observed, however during high rain events runoff to northwest. Centerline of access road crosses southeast corner of wetland. | C-7 |
| WBC3-W506 | W506 | PEM | Sector C/Cluster 13 (Turbine T26) | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC3 | 97.22 | 0.03 | | Wetland WBC23-W506 is moderate size and low value PEM with moderate vegetative diversity, located within an active agricultural field. (P522, P523) Receives water via runoff from south and southwest. Wetland's surface runoff follows topography to north to an unnamed tributary of West Branch Creek. | C-6 |
| **Cluster 14 (Turbine 27)** | | | | | | | | | | | |
| No Wetlands | | | | | | | | | | | |
| **Cluster 15 (Turbine 29)** | | | | | | | | | | | |
| WBC21-W527 | W527 | PEM | Sector C/Cluster 15 (Turbine T29) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC21 | 63.04 | 0.10 | | Moderate size, low value PEM, with moderate vegetative diversity, located in middle of agricultural field which is surrounded in all directions by a ditch.(P616, P617) Wetland is on a slight slope where water collects from surface runoff. No outlets observed | C-8 and C-9 |
| WBC25-W528 | W528 | PEM | Sector C/Cluster 15 (Turbine T29) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC25 | 41.42 | 0.09 | | Small, low value depressional PEM, with moderate vegetative diversity. Grass field to north and agricultural field to south. (P618, P619) No inflow or outflow observed. Appears isolated due to level topography and depressional wetland. Tadpoles observed in inundated areas. | C-9 |
| **Cluster 16 (Turbines T30, T31 and T32)** | | | | | | | | | | | |
| No Wetlands | | | | | | | | | | | |
| **Cluster 17 (Turbines T33, T34 and T35)** | | | | | | | | | | | |
| WBC47-W531 | W531 | PEM | Sector C/Cluster 17 (Turbines T33, T34 and T35) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC47 | 31.24 | 0.08 | | Small, low value, PEM wetland with little vegetative diversity, located in a slight depression in field. (P643, P645) Surrounding area is agricultural fields. Fields to N, W, & S about 50 ft away all recently plowed Inflow from surrounding fields and GW, no outflow observed. | C-11 |
| **Cluster 18 (Turbines T36)** | | | | | | | | | | | |
| No Wetlands | | | | | | | | | | | |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sector C Collection Line** | | | | | | | | | | | |
| WBC23-W507 | W507 | PEM | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC23 | 168.28 | 1.05 | | Very large , moderate value PEM with low vegetative diversity, located adjacent to hay field (north), corn field (east) and mixed hardwood forest (south). (P524, P524a) Wetland had some toxicant value. Wetland occurs on gentle western slope, that receives water via drain D507 (P525)and slope runoff from north and east. No channelized outflow observed, although topography and patterns of wetland vegetation extending west, indicated that wetland drains west during rain events to stream in close proximity to, but not abutting W507. | C-6 and C-7 |
| WBC23-W508 | W508 | PEM | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC23 | 168.28 | 0.21 | | Moderate sized and low value PEM (with 2 salix sp.) with low vegetative diversity, which is abutting an active agricultural field. (P530, P532) Receives water from east via drain D508 (P534). Wetland drains via drain D508, which in high rain events has overland flows to D509. | C-7 |
| WBC23-W509 | W509 | PEM | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC23 | 168.28 | 0.03 | | Small sized and high value PEM with low vegetative diversity. (P533) Receives water from groundwater seep, which forms the head waters of stream, which is outside survey corridor. Wetland drains via drain D509 (P534, P540) into unnamed tributary of West Branch Conewango Creek | C-7 |
| WBC23-W510 | W510 | PEM/PSS/PFO | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC23 | 168.28 | 0.89 | | Large mixed wetland. The northeast PEM portion is located in an active agricultural field of low vegetative diversity and value. (P541) The middle portion of wetland is PEM and has moderate diversity and value (P535, P537, P538). Portion of the middle portion is PSS of low value and moderate vegetative diversity. (P539) The west to northwest portion is a PFO with low vegetative diversity and value (P536), with only elm trees which most are dead or dying. Wetland receives water via runoff from northeast via drains D510 and D510a. Wetland drains during high rain events via overland flows. Topography of wetland slopes gently to the southwest toward stream associated with drain D509, although no direct connection observed. | C-6 and C-7 |
| WBC23-W516 | W516 | PEM | Sector C Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC23 | 168.28 | 0.17 | | Moderately sized, low value PEM wetland, with low vegetative diversity located on slope of hill. P565, P566)Receives water via Drain 516 which comes in at north end. Area continues south down slight slope. No outlets observed. Wood frog found, however has a low wildlife value. | C-5 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC23-W517 | W517 | PSS | Sector C Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC23 | 168.28 | 0.06 | | Small, low value inundated willow PSS depressional wetland, with low vegetative diversity. (P567, P568) Area surrounded by apple trees. Inflow at northern end, outflow at southern end to GW. No outlets observed. | C-5 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC23-W518 | W518 | PEM | Sector C Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC23 | 168.28 | 0.14 | | Moderate sized, low value PEM wetland with low vegetative diversity, located between apple trees (north) and an agricultural field (south) with gas line right of way to east and north edge. (P571, P572) Receives water from runoff from hill no west northwest and southeast. Outflow probably to southeast during high rain events toward forest. However no outlets observed. | C-5 |
| WBC23-W519 | W519 | PEM/PSS | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC23 | 168.28 | 0.86 | | Large sized PEM/PSS with moderate wildlife value and vegetative diversity. Located within an existing cleaved ROW for a gas line which is reverting to a PSS. (P573, P574, P575) Wetland extends beyond corridor to the north and south and completely dissects survey corridor. Receives surface water runoff and possible groundwater seepage. Drains to the south forested area via various swales and logging road ruts, ultimately reaching an Unnamed tributary to West Branch Conewango Creek. | C-5 and C-6 |
| WBC35-W523 | W523 | PEM/PSS | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC35 | 132.69 | 0.81 | | Large PEM/PSS with high diversity but low value. (P583, P584) Forested portion occurs outside corridor to the east (P585). Slight depressional area at the base of east and south sloping hills, and numerous tire ruts are very spongy. No inflow/outflow observed but prevalence of wet vegetation extending east and southeast indicates wetland W523 drains east-southeast during heavy rains to an Unnamed tributary to West Branch Conewango Creek. Wetland W523 is in very close proximity to wetland W519 at W519-23 and W519-22. In this area the boundary separating them consists of upland trees interspersed with wetland herbaceous plants. Both wetlands could be considered one in the same. | C-5 |
| WBC23-W524 | W524 | PEM | | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC23 | 168.28 | 0.00 | | Very small, low value PEM draining east via surface runoff into wet hemlock/hardwood forest.(P586) Receives surface water runoff from the west. Connection to any stream could not be verified, but wet hummock forest continuing east suggest continual runoff to stream located east of wetland. | C-6 |
| WBC45-W529 | W529 | PEM/PSS | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Adjacent with surface connection | WBC45 | 96.78 | 0.50 | | Large, moderate to high value PEM/PSS wetland with high vegetative diversity. (P620, P621) Receives surface water runoff from east and west and water from groundwater. Wetland drains west via drain D529 (P622)(vegetative swale that joins D1505 which flows west). Ultimately reaching an unnamed tributary to West Branch Conewango Creek. High wildlife value, large songbird population, and numerous ant hills located throughout wetland. | C-10 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WBC45-W530 | W530 | PEM/PSS | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC45 | 96.78 | 0.04 | | Large, moderate habitat, pollutant retention value, PEM/PSS riparian wetland to Stream S530, with low vegetative diversity. (P628, P629) Wetland receives water via S530 which originates as outflow from Pond PO530 (P626). Pond PO530 receives inflow from Drain D530, which is the same channel as Stream S530, but does not have stream characteristics northeast of pond. S530 ultimately reaches an Unnamed tributary to West Branch Conewango Creek. | C-10 |
| WBC45-PO530 | PO530 | POND | Sector C Collection Line | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC45 | 96.78 | | 0.01 | Pond associated with wetland W530, drain D530 and stream S530. (P626) | C-10 |
| WBC45-W532 | W532 | PEM | Sector C Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | WBC45 | 96.78 | 0.04 | | Small, low value PEM with little vegetative diversity, located within an unplowed agricultural field. (P648) Inflow from drainage of surrounding fields, no outlets were observed. | C-10 |
| **Sector D** | | | | | | | | | | | |
| **Cluster 19 (Turbine T38)** | | | | | | | | | | | |
| WBC107-W533 | W533 | PFO | Sector D/Cluster 19 (Turbine T38) | Unnamed tributary to West Branch Conewango Creek | Abutting | WBC107 | 159.72 | 0.02 | | Small, moderate value riparian PFO wetland with moderate vegetative diversity, located next to unmapped stream, with pit and mound topography.(P675) Slight hill to east where inflow comes from, as well as inflow from groundwater. Outflow, west to stream S533, an unnamed tributary to West Branch Conewango Creek. | D-1 |
| **NBC69-W534- See Cluster 20** | | | | | | | | | | | |
| **Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45)** | | | | | | | | | | | |
| NBC55-W42 | W42 | PEM/PSS | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC55 | 63.81 | 0.46 | | Moderate size and value PEM/PSS with moderate vegetative diversity in a broad swale between two agricultural fields. (P222, P223) Receives water via drain D1011 (P221) (up-gradient wetland W43), surface water runoff, and from agricultural drain D42. Wetland extends north beyond the survey corridor and presumably drains to an Unnamed tributary to North Branch Conewango Creek (NBC55). Moderate groundwater recharge and discharge, and toxicant filtration function and values (from the agricultural fields). Farm road crossed wetland between wetland flags W43-1 and W43-5. Some fill was used so there was slight disturbance in this wetland. | D-5 and D-6 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NBC55-W43 | W43 | PEM/PSS | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC55 | 63.81 | 0.04 | | Small, moderate value PEM/PSS, with moderate vegetative value, located in the middle of an east sloping agricultural field. (P224, P226) Receives surface water runoff and possible drain tile inflow (very wet area given position on hill for only surface water inflow). Drains east via drain D43 (P225) into drain D1011 (P227) which flows to wetland W42. Presumably drains to an Unnamed tributary to North Branch Conewango Creek (NBC55). Moderate groundwater recharge and discharge function and values. | D-6 |
| NBC57-W44 | W44 | PEM/PSS | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Abutting | NBC57 | 30.47 | 0.07 | | Small, narrow riparian wetland with moderate value and low vegetative diversity. Wetland begins as broad drainage swale (drain points D44-1 to D44-4) (P233, P234) draining north between upland agricultural field and upland forest. Becomes channelized and mapped as stream S44 at wetland flag W44-104. Moderate groundwater recharge and discharge and toxicant filtration function and values. High amphibian habitat function and value. Two species of salamanders (Desmognathus sp. and Gyrinophilus porphyriticus) observed in stream bed . | D-5 |
| NBC55-W45 | W45 | PEM | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC55 | 63.81 | 0.10 | | Small, moderate value PEM wetland, with little vegetative diversity, (P237, P238)located in an upland forest associated with historic logging roads (partially inundated) on slightly north facing sloping hill. Receives surface runoff from upgradient areas. Drains north into logging road and then east via D45 into D1012 and north to NBC55-S46. Moderate groundwater recharge and discharge function and value. | D-5 |
| NBC55-W46 | W46 | PEM | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC55 | 63.81 | 0.04 | | Small, moderate value PEM, with little vegetative diversity, located in riparian zone within berms of stream S46 within wooded area. (P239, P240) Active agricultural fields to the northeast and southwest. Moderate flood alteration and wildlife habitat function and value; minor toxicant removal value. Receives water from north from wetland W45 and drains south via stream S46, an Unnamed tributary to North Branch Conewango Creek. | D-5 |
| NBC58-W47 | W47 | PEM/PSS | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC58 | 27.46 | 0.55 | | Moderate size and value PEM/PSS wetland, with low vegetative diversity, associated with ponds PO47 (P252. P253) and PO47a (P256). Receives water in a cut in northwest corner of PO47 near wetland W47-6 and drains northeast via drain D47 beyond survey corridor Ultimately reaching an Unnamed tributary to North Branch Conewango Creek. High groundwater recharge and discharge, wildlife, amphibian, and aquatic habitat function and value. | D-4 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NBC58-PO47 | PO47 | POND | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC58 | 27.46 | | 0.19 | Pond associated with Wetland W47 (P252, P256), located adjacent to PO48. | D-4 |
| NBC58-PO47a | PO47a | POND | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC58 | 27.46 | | 0.15 | Pond associated with Wetland W47 (P252, P256), located adjacent to PO48. | D-4 |
| NBC59-W48 | W48 | PEM | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC59 | 27.16 | 0.02 | | Small, low value and function PEM wetland, with little vegetative diversity, associated with pond PO48. (P257, P258) Inflow comes from southwest corner of PO48. Flows through drain D48 northeast along southern pond berm. Wetland is adjacent with surface connection to Unnamed tributary to North Branch Conewango Creek. | D-4 |
| NBC59-PO48 | PO48 | POND | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC59 | 27.16 | | 0.23 | Pond associated with Wetland W48 (P253, P254, P257, P258), located adjacent to PO47. | D-4 |
| WBC62-W117 | W117 | PFO 1/4 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC62 | 85.43 | 0.37 | | Moderate size, high value PFO ¼ wetland with high vegetative diversity, located in headwaters of stream outside of survey corridor. (P1637, P1638, P1639) Emergent vegetation surrounded by an upland forest. Receives water via surface runoff from up-gradient to the east via groundwater seeps at W117-9 and between W117-11 and W117-12. Discharges via channeled runoff into mapped stream to the north outside survey corridor. High groundwater recharge/discharge function and value. | D-3 |
| NBC69-W534/W534a | W534/ W534a | PEM/PFO 1/4 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Abutting | NBC69 | 82.84 | 1.02 | | Southern extent of this wetland is a large, high value PEM wetland, with high vegetative diversity, associated with stream S534 (P676, P677). Wetland receives water from S534 (P679), which drains the NWI wetland to the north (W534a) and from groundwater seep near W534-27. Drains via S534 and collects runoff water from the east and west. Upstream, the northern portion of this wetland (W534a) (P689, P690, P691, P692) is a PFO 1/4 with high vegetative diversity, with upland hummocks throughout. The linear riparian poriton of the wetland is culverted across the proposed access road. Wetland shows evidence of being impacted by active farm fields on either side of wetland. Flow received from wetland W535 and drains ultimately to an unnamed tributary to North Branch Conewango Creek south and west. | D-2 and D-3 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NBC69-W535 | W535 | PFO 1/4 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Abutting | NBC69 | 82.84 | 0.12 | | Large, high value PFO 1/4, with moderate vegetative diversity. (P697) Wetland located upstream (north) from wetland W534/W534A and is associated with wetland and stream W534/S534. Topography pit and mound. S534 ultimately reaches an Unnamed tributary to North Branch Conewango Creek. | D-3 |
| NBC69-W536 | W536 | PFO 1/4 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Abutting | NBC69 | 82.84 | 0.13 | | Large, high value PFO 1/4 with pits and hummocks., with high vegetative diversity, associated with stream S534.(P701, P702) Many fallen down trees in area. Inflow from groundwater and S534 & runoff water from slight rise to east. Outflow is to west continuing to W537 and S534 an Unnamed tributary to North Branch Conewango Creek. | D-3 |
| NBC62-W537 | W537 | PFO 1/4 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC62 | 85.43 | 0.23 | | Large high value PFO 1/4 wetland with high vegetative diversity. (P703, P704, P705) Located abutting stream S534 and ends at agricultural field (where quaking aspen). Receives water from stream S534 and outflow to S534 an Unnamed tributary to North Branch Conewango Creek. | D-3 |
| NBC60-W538 | W538 | PEM | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | NBC60 | 54.91 | 0.03 | | Wetland is small, low value PEM, with little vegetative diversity, located within a depression in the middle of an unused agricultural field.(P706) Inflow from slopes of surrounding area with 15° slope greatest. No outlets observed. | D-3 |
| NBC60-W539/W539a | W539/ W539a | PEM/PSS | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | NBC60 | 54.91 | 0.04 | | Small, low value PEM/PSS, with moderate vegetative diversity, located at edge of agricultural field and woods. (P707) Receives inflow via drain D539 from west, in agricultural field. No outflow observed, due to berm-like rise in topography on east side, at the start of a hummocky area. W539a is ~10' from W539 to the west. It is a small depressional pocket in agricultural field. Although it is not connected via defined channel to W539, it is part of the same wetland due to close proximity and likelihood of surface runoff passing from W539a to W539. | D-3 |
| NBC59-W540 | W540 | PEM | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC59 | 27.16 | 0.27 | | Moderate size and value PEM wetland, with low vegetative diversity. Located east and downslope of an agricultural field. (P714, P715) Receives runoff from adjacent up-gradient agricultural field. Outflow to groundwater and drains north via a channel east of corridor to Unnamed tributary to North Branch Conewango Creek. (Wetland is located within both NBC59 and NBC60 watersheds however outflow is within NBC59) | D-4 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NBC62-PO1500 | PO1500 | POND | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | NBC62 | 85.43 | | 0.01 | Small, isolated pond associated with historic logging road. (P699) | D-3 |
| **Cluster 21 (Turbines T46 and T47)** | | | | | | | | | | | |
| NBC46-W28 | W28 | PFO 1/4 | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC46 | 162.04 | 0.39 | | Moderate size, high value PFO ¼ wetland, with high vegetative diversity. (P165) Receives surface water runoff from upgradient. Drains south via PEM portion of Wetland W28 at W28-12 (P163) and south to a cow pasture (P164) beyond survey corridor, ultimately reaching an unnamed tributary to North Branch Conewango Creek. High groundwater recharge and discharge and wildlife habitat value. Located across watersheds SVC142, NBC39 and NBC46, mapped portion drains primarily in NBC46 to the south. | D-8 and D-9 |
| NBC46-W29 | W29 | PFO 1/4 | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | SVC142 and NBC46 | 43.25 and 162.04 | 0.32 | | Moderate size, high value PFO ¼ wetland, with high vegetative diversity. (P166, P167, P168) Located in a natural depression on a small ridge between SVC142 and NBC46 Receives surface water runoff from upgradient. Drains south at W29-6 and -7 (P169), although weltand predominately drains southwest (W29-1open and -18open), ultimately reaching an Unnamed tributary to North Branch Conewango Creek. High groundwater recharge and discharge and wildlife habitat value. Multiple Red Spotted Newt sitings. | D-9 |
| NBC46-W30 | W30 | PEM/PSS | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC46 | 162.04 | 0.85 | | Moderate size and value PEM/PSS wetland with some wet trees on periphery and scattered throughout, with moderate vegetative diversity. (P170, P171, P174) Receives surface water runoff from upgradient wetland W29 and adjacent upland areas. Drains southeast via discrete overland flow beyond Wetland W30-115 to Wetland W28 in cow pasture, ultimately reaching an Unnamed tributary to North Branch Conewango Creek. Moderate groundwater recharge and discharge and wildlife habitat value (P175). | D-8 and D-9 |
| NBC46-W31 | W31 | PEM | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Abutting | NBC46 | 162.04 | 0.59 | | Moderate size riparian PEM wetland within the banks of stream S31 (P181, P182, P183). Moderate vegetative diversity. Receives water from up-gradient wetland (where stream S31 originates outside corridor), agricultural drain tile discharge near W31-3 (P184), surface water runoff from drain D31, and groundwater discharge near W31-12 to W31-14. Wetland and stream continue southeast beyond survey corridor. Moderate flood alteration and moderate amphibian habitat function and value. | D-8 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NBC46-W32 | W32 | PEM | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC46 | 162.04 | 0.04 | | Small inundated PEM on top of slightly southeast sloping hillside, is natural depression, adjacent to forested area, down-gradient from wetland W29. (P185, P186) Also receives surface water runoff from agricultural field. Drains to the southeast via discrete overland flow to stream S31. High groundwater recharge and amphibian habitat function and values. | D-8 |
| NBC46-W120 | W120 | PEM | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC46 | 162.04 | 0.04 | | Small, medium value PEM with moderate vegetative diversity; located in a natural depression between forest and pastrure. (P1645) Receives surface water runoff from adjacent upland areas and drains south via drain D120 to Wetland W121, ultimately reaching stream S31, an unnamed tributary to North Branch Conewango Creek. | D-8 |
| NBC46-W121 | W121 | PEM | Sector D/Cluster 21 (Turbines T46 and T47) | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC46 | 162.04 | 0.05 | | Small, high value PEM wetland, with low vegetative diversity, inundated to 12" in a natural depression in a historic pasture.(P1646, P1948) Receives water via drain D120 and drains to Wetland W31/Stream S31 via drain D121 (P1647). High groundwater recharge/discharge and amphibian function and value. | D-8 |
| **PO5000-See Sector D Collection** | | | | | | | | | | | |
| **Cluster 22 (Turbines T48, T50 and T51)** | | | | | | | | | | | |
| SVC138-W16 | W16 | PEM/PSS | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Abutting | SVC138/SVC 137 | 54.77/137.16 | 0.85 | | Moderate to large size and high wildlife and groundwater discharge value PEM/PSS wetland with moderate vegetative diversity, located in a broad natural swale. (P91, P94, P95) Receives water via surface runoff and groundwater discharge from south end. Wetland extends south (upgradient) and north beyond survey corridor via stream S16 (P96), which ultimately reaches an Unnamed tributary to Silver Creek. (Starts in watershed SVC138 and drains into SVC137) Portion of wetland in vicinity of Access road crossing is impacted by historic machinery ruts (P92, P93). | D-13 |
| SVC137-W18 | W18 | PEM | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC137 | 137.16 | 0.02 | | Small, low value PEM, with little vegetative diversity, located within a natural swale and cow pasture. (P88) Receives surface water runoff. Wetland drains west via overland flow to Drain D1004 (P89), ultimately reaching an unnamed tributary of Silver Creek. | D-12 |
| SVC140-W34 | W34 | PFO 1/4 | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.05 | | Mapped portion of wetland W34 is a Moderate size and value PFO ¼ on a southeast sloping hillside typified by pit and mound topography. (P196, P197) Receives surface water runoff from up-gradient areas and drains to the southeast beyond the survey corridor via wetland W34. Moderate groundwater recharge and discharge function and value. No amphibians noted within mapped portion. | D-10 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC140-W35 | W35 | PFO 1/4 | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.41 | | Moderate size and value PFO ¼ typified by pit and mound topography with moderate vegetative diversity located on hilltop. (P198, P199, P200, P201) Receives surface water runoff from up-gradient areas. Drains predominantly west. Wetland continues west beyond the survey corridor. The northeast portion of the wetland drains to the northeast via discrete overland flow to wetland W34. High groundwater recharge and discharge function and value well as amphibian habitat function and value. | D-10 |
| SVC140-W36 | W36 | PFO | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.21 | | Wetland W36 is a small PFO located on a northeast slightly sloping hillside typified by pit and mound topography. (P202, P203) The wetland extends further northeast beyond the survey corridor. Inflow is from surface water runoff from up-gradient areas and drains to the northeast beyond the survey corridor presumably to S22, an unnamed tributary to Silver Creek. Moderate groundwater recharge and discharge function and value. | D-10 |
| SVC140-W37 | W37 | PEM in forested area | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.08 | | Small PEM on edge of forested area. Receives surface water runoff from up-gradient areas and from wetland W38 and drain D38. (P204) Wetland W37 drains northeast past cut in pond bank of pond PO1000 (P205, P206, P212). Pond PO1000 does drain into the north end of wetland W37 during high runoff events (Pond PO1000 also drains north via cut in pond bank) into wetland W38. All features presumably drain to S22, an unnamed tributary to Silver Creek based on landscape design. Moderate groundwater recharge and discharge function and value. | D-10 |
| SVC140-W38 | W38 | PFO 1/4 | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.07 | | Small to moderate size and value PFO ¼ with moderate vegetative diversity typified with pit and mound topography on top of hill. (P207) Receives surface water runoff from upland areas and drains primarily to the north via drain D38 into wetland W37. (P208) A small amount may drain to the south to an unmapped portion of wetland W35 beyond the survey corridor. Moderate groundwater discharge and recharge function and value. Appears to have a high amphibian habitat value although none were observed. | D-10 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC140-W39 | W39 | PEM | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.05 | | Small, moderate value PEM wetland with little vegetative diversity; associated with a natural depression in a field adjacent to a forested area.(P209, P210) Receives surface water runoff from up-gradient areas and drains to the northwest via drain D39 at wetland flag W39-3 to allow water to drain northwest into Pond PO1000 (Photo 207). Wetland also continues northwest beyond the survey corridor at wetland flag W39-7 | D-10 and D-11 |
| SVC138-W40 | W40 | PEM | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC138 | 54.77 | 0.15 | | Moderate size and value PEM, with low vegetative diversity. Receives water via drain D40 that is an effluent drain from a cut in the northwest corner of pond PO1000 bank.(P214) Wetland extends beyond the survey corridor ultimately reaching stream S16 via discrete overland flow. Moderate groundwater recharge and discharge function and values. Wetland located within watershed SVC138, however may drain to watershed SVC137 via S16. | D-10 and D-11 |
| SVC138-W41 | W41 | PEM | Sector D/Cluster 22 (Turbines T48, T50 and T51) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC138 | 54.77 | 0.02 | | Small isolated PEM associated with a natural depression in an active cow pasture. Receives surface water runoff via drain D41 from adjacent upland areas. It drains northeast via overland flow beyond the wetland boundary and reverts back to groundwater. No surface connection to Traditionally Navigable Waters. Moderate groundwater recharge and discharge function and values as well as amphibian habitat function and value although none were observed. | D-10 and D-11 |
| SVC140-PO1000 | PO1000 | POND | Sector D/Cluster 22 (Turbines T48, T50 and T51) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 and SVC138 | 67.74 and 54.77 | | 0.18 | Large pond associated with several wetlands including W37, W38 and W40. (P205, P206, P211, P212) | D-10 and D-11 |
| **Cluster 23 ( Turbines T52, T53 and T55)** | | | | | | | | | | | |
| SVC131-W1 | W1 | PEM | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC131 | 67.99 | 0.09 | | Small, low value emergent linear feature associated with drainage swale between cow pasture and forested area. (P02, P03) Receives surface water runoff and drains east and then north to an Unnamed tributary of Silver Creek. Wetland located within watershed SVC131 and is adjacent with a surface connection. | D-17 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC131-W2 | W2 | PEM/PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC131 | 67.99 | 0.65 | | Large, moderate value PFO, that drains northeast from a top of a hillside into a reverting agricultural field PEM component. (P13, P14, P15) Typified by pit and mound topography. Additional surface water run-off provided by drains D2a through D2C (P16, P17), which drain north and east into PEM agricultural field. PEM portion drains northeast beyond survey corridor into Drain D3 and Wetland W3, ultimately reaching an unnamed tributary of Silver Creek. Receives surface water runoff and drains east and then north to an Unnamed tributary to Silver Creek. | D-17 |
| SVC131-W3 | W3 | PEM | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC131 | 67.99 | 0.14 | | Medium sized and moderate value PEM wetland with low vegetative diversity, located in a broad swale of reverting field. (P10, P11) Receives water from surface runoff and groundwater discharge. Drains southeast via Drain D-3 (P12) beyond survey corridor to unknown tributary to Silver Creek. | D-17 |
| SVC129-W4 | W4 | PEM/PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.58 | | Moderate size, low value PFO/PEM wetland located within a cow pasture and adjacent to forested area. Wetland has pit & mound topography throughout forested portion W4-10 (P26) to W4-23 and PEM portion W4-1 to W4-10 and W23 to W4-41 (historic cow pasture) (P21, P22, P24). Wetland receives surface runoff from drain D4 near W4-7 and D4A near W4-9, and from groundwater seeps. Drains north via Drain 1001 near W4-30 and drains NE from Drain D4C east of W4-33. Wetland drains via D4b ultimately to S1001, an unnamed tributary to Silver Creek. | D-18 and D-19 |
| SVC129-W5 | W5 | PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.76 | | Moderate to large PFO, with moderate groundwater recharge and discharge value. Wetland has moderate vegetative diversity and wildlife habitat value. Wetland is typified with pit & mound topography. (P31, P32) Wetland receives water via surface runoff and drains northeast via D5 to D1001 (effluent draw from W4-30). Ultimately reaching stream S1001, an unnamed tributary to Silver Creek. | D-18 |
| SVC133-W6 | W6 | PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC133 | 87.19 | 0.56 | | Moderate size and value PFO, with moderate vegetative diversity, typified with pit & mound topography located on slight Northeast sloping hill.(P36, P37) Moderate groundwater recharge and discharge value. Receives water via surface water runoff and drains east to Stream 1002 (P33, P34) via drain D6 (35) at W6-25. Ultimately reaching S1000, an unnamed tributary of SilverCreek. | D-15, D-16 and D-18 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC136-W7 | W7 | PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Abutting | SVC136 | 60.55 | 0.74 | | Moderate size and value PFO, with moderate vegetative diversity, typified by pit and mound topography. (P43, P46) Receives surface water runoff and abuts Stream S7 (P44, P45) beyond (to the north-northwest) of the survey corridor. Moderate wildlife habitat and groundwater recharge and discharge value. Stream S7 flows North to unnamed tributary to Silver Creek. | D-15 |
| SVC133-W8 | W8 | PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC133 | 87.19 | 0.32 | | Moderate size, moderate value and vegetative diversity PFO typified by pit and mound topography near top of northeast sloping hillside. (P49, P50), Moderate groundwater recharge and discharge value as well as moderate wildlife habitat value. The wetland receives up gradient surface water run-off with no apparent surface connection to Traditionally Navigable Waters. No drainage features identified. Surface water reverts to groundwater beyond wetland boundary. | D-15 and D-16 |
| SVC129-W124 | W124 | PEM/PFO | Sector D/Cluster 23 ( Turbines T52, T53 and T55) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.35 | | Small, low value PEM/PFO wetland, with low vegetative diversity, formed along an inundated and saturated old logging roads (P1658, P1660) crossing upland forest (P1659). Receives water via overland sheet flow and possible groundwater seepage. Outlet via down gradient groundwater reversion and overland flow. Assumes that wetland flows to Wetland W5 via southwest, ultimately to Stream S1001, an unnamed tributary to Silver Creek. Some groundwater recharge/discharge function and value. | D-18 |
| **Sector D Collection Line** | | | | | | | | | | | |
| NBC39-W9 | W9 | PEM | Sector D Collection Line | Unnamed tributary to Silver Creek | Abutting | NBC39 | 38.70 | 0.16 | | Moderate size and value riparian wetland, with moderate vegetative diversity. Wetland located within the banks of stream S9 (P57, P58). High groundwater recharge and discharge value and flood flow alteration value. Stream S9 (P55, P56) ultimately reaches an unnamed tributary of SilverCreek. | D-15 and D-16 |
| SVC136-W10 | W10 | PFO 1/4 | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC136 | 60.55 | 0.24 | | Moderate size and value PFO 1/4 , typified by pit and mound topography, located within a historic inundated logging road. (P60, P61) Wetland is assumed to be adjacent with surface connection based on landscape position and proximity to mapped wet area, appears to drain to stream S7. | D-15 and D-16 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC136-W11 | W11 | PFO | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC136 and NBC 39 | 60.55 and 38.70 | 0.55 | | Moderate to large PFO that spans the survey corridor. High groundwater recharge and discharge function and value and high wildlife habitat function and value.(P62, P63, P64) Northern portion of wetland (P65) is associated with SVC136 watershed and southern portion of wetland is associated with NBC39 watershed near a non-delineated portion of Stream S9 (P66). Wetland receives surface water runoff and groundwater seepage which appears to drain North-northeast to stream S7 in watershed SVC136. | D-15 |
| SVC136-W12 | W12 | PFO | Sector D Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC136 | 60.55 | 0.01 | | Small isolated wetland with little value and low vegetative diversity, (P67) associated with natural depressions which receive surface water runoff. No drains connecting it to Traditionally Navigable Waterways. Adjacent with out surface connection to SVC136. | D-15 |
| SVC136-W13 | W13 | PFO 1/4 | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC 136 | 60.55 | 1.93 | | Large, high value PFO ¼, with high vegetative diversity, typified by pit and mound topography (P69, P70, P71, P72)and impacted by historic logging roads in multiple areas (P76, P77, P78) including area to be crossed by Access Road 21 near wetland flag W13-16 (P74, P75). Eastern portion of delineated wetland is associated with non-delineated portion of stream S9. The western portion contains a vernal pool (inundated portion of logging road (P68)) and more logging road impacts that drain north via Drain D13 (P78) beyond the survey corridor ultimately to S22, an unnamed tributary to Silver Creek. | D-14 and D-15 |
| SVC140-W14 | W14 | PFO | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.16 | | Moderate size and value PFO, with moderate vegetative diversity, located near top of slight hill. (P79, P80, P81, P82)Wetland topography is pit and mount and has been heavily impacted by logging (clearing and roads). Receives surface water runoff and drains north via drain D14 into wetland W15 and ultimately to S22, an unnamed tributary to Silver Creek. Moderate groundwater recharge and wildlife (flushed turkey) values. | D-14 |
| SVC142-W15 | W15 | PFO 1/4 | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC142 | 43.25 | 0.88 | | Moderate size and value PFO ¼ near top of slightly northeast sloping hillside. (P137, P138, P139) Moderate vegetative diversity and wildlife habitat function and value. High groundwater recharge and discharge function and value. Receives surface water runoff via rutted logging roads (W15-1 to W15-3 and W15-100 to W15-103) which drains north to wetland. Wetland extends northeast beyond survey corridor and drains ultimately reaching an Unnamed tributary to Silver Creek. Wetland likely connects to wetland W13 and stream S22 outside survey corridor. | D-9 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC138-W17 | W17 | PSS | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC138 | 54.77 | 0.36 | | Moderate size PSS wetland with high habitat and groundwater recharge/discharge value, with moderate vegetative diversity, located on slight north and northeast sloping hillside. (P97, P98, P99)Wetland severely impacted by historic machinery ruts which transverse hillside (east to west) and holds precipitation. Receives water via upgradient surface water runoff from the south. Wetland drains north via Drains D17 and D17a (P100) beyond wetland boundary where drains reverts to discrete overland flow, presumably to watershed NBC 38. Numerous micro-drainages observed between vegetation on hillside northeast of wetland. | D-14 |
| SVC140-W19 | W19 | PEM | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.03 | | Small, low value PEM with little vegetative diversity, associated with periodically inundated logging road (P106, P107). Receives stormwater runoff and drains east via Drain D19 to adjacent large wetland complex beyond survey corridor which presumably drains northeast to S22, an unnamed tributary of Silver Creek. | D-14 |
| SVC136-W20 | W20 | PEM/PFO | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC136 | 60.55 | 0.40 | | Moderate size and groundwater recharge/discharge and wildlife value wetland with both PEM (P109) and PFO (P108) components with, moderate vegetative diversity. Wetland originates upgradient (southwest) beyond survey corridor. Receives water via groundwater discharge and surface water runoff. Wetland drains via drain D20 in old machinery ruts (P110), reverting to discrete overland flow at D20-5. (P1650, P1651) | D-14 |
| SVC140-W21 | W21 | PEM | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.03 | | Small, low value PEM with little vegetative diversity, located natural depression in an upland forested area (approximately 10% elm and ash) with pit and mound topography. (P111) Wetland begins southwest beyond survey corridor and drains via Drain D21 (P112) into an inundated logging road associated with Wetland W19, ultimately reaching S22, an unnamed tributary of Silver Creek. | D-14 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC140-W22/W22a | W22/W22a | PEM/PFO | Sector D Collection Line | Unnamed tributary to Silver Creek | Abutting | SVC140 | 67.74 | 0.73 | | Moderate size and value PFO riparian wetland, (P118, P119)with high vegetative diversity, located with in the banks of stream S22 (P113, P114, P115, P116, P117). Wetland drains northeast into larger wetland complex outside survey corridor, ultimately reaching Unnamed tributary to Silver Creek. High groundwater recharge/discharge and wildlife habitat. W22a is located along stream S22 and S123 (P1654, P1655. Receives water via overland flow from east and west and from streams S22/S123 (P1656, P1657) during high water events and by groundwater discharge. Outlets via Stream S22 flow to the north and to groundwater. | D-14 |
| SVC140-W23 | W23 | PEM in forested area | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.10 | | Small, low value, PEM, with little vegetative diversity, associated with natural swale and some inundated machinery ruts in upland forest. (P121) Receives surface runoff and runoff from ruts (P120) during storm events. Drains northeast to Wetland W22-26 via drain D23-1, ultimately to Stream S22, an unnamed tributary to Silver Creek. | D-14 |
| SVC140-W24 | W24 | PFO | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 1.22 | | Moderate size and value PFO, with moderate vegetative diversity located on Northeast side of sloping hill. (P124, P125) High groundwater recharge and discharge function and values. Historic logging ruts and inundated pools (from ruts) in many places. Receives surface water runoff and groundwater discharge that drains northeast via drain D24 (P131) into adjacent wetland W22. Also receives surface water runoff from wetland W13 via drains D13-1 and D13-2. | D-9 and D-14 |
| SVC140-W25 | W25 | PFO 1/4 | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC140 | 67.74 | 0.05 | | Small PFO ¼ associated with pit and mound topography on slightly north sloping hill. Receives surface water runoff via drain D25 (P140) at wetland W25-1. Drain D25 drains north (D25-5 to D25-7) before reverting to discrete overland flow into wetland W15 (P141). Ultimately reaching S22, an unnamed tributary to Silver Creek. | D-9 |
| SVC142-W26 | W26 | PEM/PSS/PFO | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC142 | 43.25 | 1.70 | | Large PEM/PSS/PFO wetland complex with moderate value and vegetative diversity. (P142, P143)Primarily PEM/PSS throughout with PFO components mainly along periphery. Positioned on north-northeast sloping hillsides. Receives surface water runoff from up-gradient wetland and Drain D26a (P150, P151) and groundwater discharge. Extends northeast beyond the survey corridor. Presumably drains into S22, an unnamed tributary of Silver Creek. | D-9 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC142-W27 | W27 | PFO 1/4 | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC142 | 43.25 | 0.42 | | Moderate size, high value PFO ¼ wetland, with moderate vegetative diversity. (P155, P157) Located near top of northeast sloping hill in a natural depression. Receives surface water runoff from upgradient (W27-9 and -10). Drains via Drain D27 northeast (P152, P153, P156) in to Wetland W26, ultimately reaching S22, an unnamed tributary to Silver Creek. High groundwater recharge and discharge and wildlife habitat value. | D-9 |
| NBC49-W33 | W33 | PEM/PSS | Sector D Collection Line | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC49 | 42.98 | 0.76 | | Moderate size and value PEM/PSS with moderate vegetative diversity located in broad swale between cow pasture (up-gradient) and agriculture fields. (P191, P192, P193, P194) Receives surface water runoff from up-gradient cow pasture (P195)and drain D33 that starts in the cow pasture and extends to the roadside ditch. Moderate toxicant filtering and wildlife habitat function and value. Roadside ditch drains to the northwest through culvert under Bartlett Hill Road and flows to a farm pond. Upon further desktop review, the pond outflow will drain to the northeast, and then north to the headwaters of stream S31. Wetland located within watershed NBC49 but drains in to watershed NBC48. | D-7 |
| SVC129-W49 | W49 | PEM | Sector D Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.05 | | Small, low value PEM wetland with little vegetative diversity,(P261) located at the confluence of 2 drains in active cow pasture; heavily disturbed. Receives up-gradient surface water run-off and drains east via drain D49 (P262) to stream S1001, an Unnamed tributary to Silver Creek. | D-19 and E-1 |
| SVC138-W122 | W122 | PEM | Sector D Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC138 | 54.77 | 0.03 | | Small, low value PEM wetland with low vegetative diversity, associated with historic logging roads. (P1649) Receives surface runoff via up-gradient runoff. Drains northeast into machinery ruts in adjacent field, without reaching wetland W17. No connection to traditionally navigable waters observed. | D-14 |
| SVC140-W123 | W123 | PEM | Sector D Collection Line | Unnamed tributary to Silver Creek | Abutting | SVC140 | 67.74 | 0.01 | | Small, low value PEM wetland associated with historic, wet logging road crossing. (P1654, P1655) Wetland located within, Stream S123 (P1652, P1653) which drains east from an unmapped wetland southwest of survey corridor to Stream S22/Wetland W22 (P1656, P1657), an unnamed tributary to Silver Creek. | D-14 |
| NBC49-PO5000 | PO5000 | POND | Sector D Collection Line | Unnamed tributary to North Branch Conewango Creek | Adjacent with surface connection | NBC49 | 42.98 | | 0.07 | Small pond east of collection line, south of T46. (P187, P188) | D-7 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sector E** | | | | | | | | | | | |
| **Cluster 24 (Turbine T56)** | | | | | | | | | | | |
| SVC129-W551 | W551 | PEM/PSS | Sector E/Cluster 24 (Turbine T56) | Unnamed tributary to Silver Creek | Abutting | SVC129 | 156.58 | 0.11 | | Moderate size, and value PEM/PSS wetland, with high vegetative diversity, with 2 Salix trees.(P764) Stream recharge, pollutant retention/filtration, and wildlife habitat values (moderate to high). Receives inflow from west via hillside runoff and via large groundwater seep (P763). Flow is observed from seep through wetland W551 to stream S551 on east side of wetland (D551). Inflow also from drain D551a from west. Outflow via S551 an Unnamed tributary to Silver Creek. | D-19 and E-1 |
| SVC129-W552 | W552 | PEM | Sector E/Cluster 24 (Turbine T56) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.02 | | Small, low value PEM wetland with some stream recharge valuem, with little vegetative diversity. (P768) Receives inflow from north via drain D552a and hillside groundwater seep. Outflow via D552 to stream S551, which is approximately 10 feet away to the southeast, ultimately reaching an Unnamed tributary to Silver Creek. | E-1 |
| SVC129-W553 | W553 | PEM | Sector E/Cluster 24 (Turbine T56) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC129 | 156.58 | 0.02 | | Small, high wildlife value PEM wetland with low vegetative diversity, (P770) associated with farm pond PO553(P769, P771) that is NWI mapped wetland. Receives inflow from hillside runoff from southwest. No outflow observed. Burn pile in southwest corner probably within wetland. Wildlife observed include wood ducks, red-winged blackbirds and swallows in addition many tadpoles and other juvenile amphibians (maybe newts). | E-1 |
| SVC129-PO553 | PO553 | POND | Sector E/Cluster 24 (Turbine T56) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC129 | 156.58 | | 0.02 | Pond PO553 associated with wetland W553 (P769, P771). Pond is part of an NWI mapped wetland. | E-1 |
| SVC129-W554 | W554 | PEM | Sector E/Cluster 24 (Turbine T56) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.07 | | Moderate size, low value PEM wetland with few small shrubs, and 1 pear tree, with moderate vegetative diversity. (P772, P773) Receives inflow from slopes on west/north sides. Topography slopes steeply on south and east sides. Overland flow from wetland W553 south via farm roads, to drain D552A (P774), then to W552, then to stream S552, an unnamed tributary to Silver Creek. | E-1 |
| SVC119-W556 | W556 | PEM | Sector E/Cluster 24 (Turbine T56) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC119 | 26.94 | 0.01 | | Small, low value PEM in forested area with low vegetative diversity,(P781, P782) located in a small depressional area that holds runoff from slope to southeast (in active hayfield). No outflow observed. | E-1 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC121-W557 | W557 | PEM | Sector E/Cluster 24 (Turbine T56) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC121 | 13.07 | 0.03 | | Small, low value PEM wetland with little vegetative diversity, located in a depressional area. (P783) Electric fence bisects wetland. Connected to larger wetland complex outside corridor by discrete flow. Then flows to stream S561, an unnamed tributary to Silver Creek. | E-1 |
| **Cluster 25 (Turbines T57, T58, T59, T60 and T67)** | | | | | | | | | | | |
| SVC118-W129 | W129 | PFO 1/4 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC118 | 86.74 | 0.46 | | Moderate size and value PFO wetland with moderate vegetative diversity. (P1687, P1688) Wetland made by interweaving old logging roads within a Beech-Maple upland forest. Receives surface water and drains south via overland flow to drain D129 (P1689, P1690) to stream S576, an unnamed tributary to Silver Creek. High wildlife/amphibian habitat function and value. Moderate groundwater recharge/discharge function and value. | E-7 |
| SVC118-W130 | W130 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC118 | 86.74 | 0.01 | | Small, low value, PEM wetland with moderate vegetative diversity. (P1697) Existing gas well, tank and access road all within wetland (P1699). Receives surface water runoff from northwest and northeast and drains via drain D130 to the south southwest in to stream connecting to stream S576 to the south. Low groundwater recharge/discharge function and value. | E-7 |
| SVC118-W131 | W131 | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC118 | 86.74 | 0.01 | | Small, low value PEM wetland with little vegetative diversity, associated with logging road crossing at a natural depression in an upland forest. (P1700) Receives surface water runoff, which drains southeast via drain D131 and merges with stream S132 at access road crossing. Continues south to wetland W576 and stream S576, an unnamed tributary to Silver Creek. | E-7 |
| SVC118-W132 | W132 | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC118 | 86.74 | 0.05 | | Small, moderate value, riparian PEM with low vegetative diversity. Located within banks of stream S132. (P1701, P1702) Some flood flow attenuation function and value. | E-7 |
| SVC118-W133 | W133 | PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC118 | 86.74 | 0.14 | | Moderate size, low value PFO1, typified by pit and mound topography, with little vegetative diversity.(P1708, P1709) Receives surface water runoff and drains north into stream S576 (P1710, P1711) near wetland W133-17, -18, -19. Road culver east of W133-5 and -6 doesn't appear to have hydrologic influence as it is 8-10" above wetland grade and is partially filled with soil. Low groundwater discharge/recharge function and value. | E-4 and E-7 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC204-W134 | W134 | PSS | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC204 | 88.65 | 0.15 | | Moderate size and value, PSS wetland with low vegetative diversity, adjacent to forested area. (P1712, P1713) Receives surface runoff from upgradient areas (including portions that extends north into forested area (W134-12 to W134-17) and drains east to culvert into wetland W577 (at W577-1f and W577-1g) (P1714, P1715, P1716, P1717) during high rain events and reaches stream S577 an unnamed tributary to Silver Creek. | E-4 |
| SVC117-W565 | W565 | PEM/PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC117 | 25.28 | 0.06 | | Moderate size, high value PEM/PFO wetland, with moderate vegetative diversity, located east of T57, mostly outside of survey corridor.(P807) Surrounded by upland forest (standing pool of water in center) to north, east, and southeast. High value/functions of groundwater recharge/discharge, wildlife habitat, and possibly nutrient retention from runoff of pasture to west. Receives surface sheetflow from northwest and drainage runoff from drain D565 though a cut in berm south of pond PO565 (P806). Discharge is to the east into an unnamed tributary to Silver Creek, non-delineated stream. | E-5 |
| SVC117-PO565 | PO565 | POND | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC117 | 25.28 | | 0.01 | Small pond associated with wetland W565 (P806) | E-5 |
| SVC116-W566 | W566 | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC116 | 31.43 | 0.03 | | Small, low value PEM wetland, with little vegetative diversity, (P808) located in an inundated depression. 95% water, 5% vegetation. Inflow via discrete runoff from cow pastures to west. Outflow via drain that ends 30 feet east of wetland, on level ground. No connection to traditional navigable waters observed. | E-5 |
| SVC112-W573 | W573 | PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC112 | 25.78 | 0.01 | | Small, low value depressional PFO wetland with little vegetative diversity, that continues outside survey corridor to the north for approximately 100 feet then ends into pit and mound topography. (P852) Inflow via surface water runoff from adjacent up-gradient area. Outflow to pit and mound topography outside the survey corridor. No surface water connection observed beyond survey corridor. | E-7 |
| SVC118-W574/W574a | W574/ W574a | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC118 | 86.74 | 0.01 | | Small, low value inundated depressional wetland with very little vegetation that is located on the collection centerline. Receives discrete runoff inflow from northwest –sloping topography. No outflow observed. W574 is natural depression (P853). W574a occurs 3 feet northwest (P854), separated by upland vegetation, but likely drains to W574 during heavy rainfall. | E-7 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC118-W575 | W575 | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC118 | 86.74 | 0.04 | | Series of depressional PEM areas and old logging roads located in a forested area. (P855, P856) Wetland has moderate to low value and vegetative diversity. Receives inflow is from surrounding areas of higher elevation. Outflow is to unnamed tributary to Silver Creek. | E-7 |
| SVC118-W576(A-D) | W576/ W576a/ W576b/ W576c/ W576d | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC118 | 86.74 | 0.11 | | Wetland is moderate PEM in forest. Wetland is in valley along stream. Inflow is from associated stream and surrounding areas of higher elevation. Outflow is to stream. Diversity is moderate to low. Wildlife value is moderate to low. Wetland is 4 small wetlands (P859, P860, P861 ,P862, P863) connected along stream S576, an unnamed tributary to Silver Creek. | E-7 |
| SVC204-W577 | W577 | PEM/PSS | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC204 | 88.65 | 0.79 | | Large to moderate size, moderate value PEM/PSS wetland with high vegetative diversity. (P867, P868) Area is slightly depressional, located between agricultural field with apple trees (south, east, west) and forest (north). Inflow from numerous ditches, groundwater, runoff from surrounding areas with higher elevation. Outflow to ditches and streams. | E-4 |
| SVC204-W578 | W578 | PEM/PSS | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC204 | 88.65 | 0.25 | | Moderate size, low value PEM/PSS wetland with moderate vegetative diversity; (P870, P871) located on north sloping hillside in cow pasture. Small hummocks created by cattle. Drains north down hillside via discrete flow into wetland W577 and then to stream S577. Also, channelized outflow outside of survey corridor connects W578 to W 577 and then to S577. | E-4 |
| SVC204-W579 | W579 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC204 | 88.65 | 0.33 | | Large to moderate size, low value depressional PEM wetland, with moderate vegetative diversity, located in a cow pasture.(P876, P877) Inflow from drain D579 and small surface runoff from field to south. Outflow to north at D579. Ultimately reaching an unnamed tributary to Silver Creek. | E-2 and E-4 |
| SVC204-W580 | W580 | PEM/PSS | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC204 | 88.65 | 0.08 | | Moderate, low value inundated depressional PEM wetland with moderate vegetative diversity. (P880) Located in a cow pasture. Inflow from west via drain D580a. Outflow north via D580 (P881), which turns to discrete flow and reaches wetland W577, which drains to S577, an unnamed tributary to Silver Creek. | E-2 and E-4 |
| SVC204-W581 | W581 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC204 | 88.65 | 0.19 | | Small, low value PEM wetland with moderate vegetative diversity, located in a cow pasture. (P882) Many small depressions filled with water formed by cow treads. Inflow from drain D580, also from areas south of higher elevation. Pasture and shrubby areas surrounding. Outflow to drain north to an unnamed tributary to Silver Creek. | E-2 and E-4 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC204-W582 | W582 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC204 | 88.65 | 0.12 | | Moderate size, low value PEM wetland with low vegetative diversity. (P886) Located within an active cow pasture. Some dominant vegetation is upland vegetation, but overall hydrology, soils, and vegetation are strong enough indicators of wetland. Agricultural drain (D582) is dug through wetland W582, and provides outflow northeast to stream S577 which is actually in the Silver Creek 204 watershed. | E-2 and E-9 |
| SVC76-W583 | W583 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC76 | 75.71 | 0.06 | | Moderate size and value PEM wetland with moderate vegetative diversity, located in a hemlock forest, valley. (P891, P892) Inflow from groundwater seeps in hillside and runoff from higher elevation. Outflow to stream S583 (P892, P893), an unnamed tributary to Silver Creek. | E-6 |
| SVC76-W584 | W584 | PEM/PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC76 | 75.71 | 0.12 | | Moderate size, and value depressional PEM/PFO wetland, with moderate vegetative diversity.(P895) Wetland is comprised of 8 inches of highly decomposed organic matter atop mucky water. Moderate stream recharge value. Receives inflow via groundwater and hillside discrete flow from south. Drains via confined channel north (down-gradient) to other wetland features (out of corridor) and then to stream S583, an unnamed tributary to Silver Creek. | E-6 |
| SVC76-W585 | W585 | PEM/PFO 1/4 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC76 | 75.71 | 0.24 | | Moderate size and value, inundated, depressional PEM wetland with low vegetative diversity, located within forested areas in hemlock/sugar maple forest (PFO 1/4) (P896, P897). Odor of decomposing matter present. Wildlife value is moderate – no amphibians observed but many deer droppings present. Inflow from runoff of areas of higher elevation. No outflow observed. | E-6 |
| SVC76-W586 | W586 | PEM/PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC76 | 75.71 | 0.15 | | Moderate to large, moderate value PEM/PFO wetland with moderate vegetative diversity. PEM is the northeast half (P899), PFO is the southeast half (P898). Moderate wildlife value due to secluded forest area (lots of scat observed). Depressional area that receives groundwater inflow and discrete runoff from southwest. Culverted outflow (out of corridor) to south, to undelineated unnamed tributary to Silver Creek. | E-6 |
| SVC116-W587 | W587 | PEM/PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC116 | 31.43 | 0.37 | | Moderate size and value, depressional PEM/PFO wetland with forested hummocks in sugar maple forest, with moderate vegetative diversity. (P900, P901) Inflow from higher elevation surroundings. No outflow observed. | E-5 and E-6 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC204-W588 | W588 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC204 | 88.65 | 0.04 | | Small, low to moderate value PEM wetland with little vegetative diversity, located in cow pasture. (P905, P906) Wetland high disturbed by cows. Inflow from surrounding area of higher elevation. Outflow to drain D588 which ends a short distance from wetland. No surface flow path to stream S577 observed. | E-2 |
| SVC124-W589 | W589 | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC124 | 87.49 | 0.03 | | Moderate size, low value PEM wetland, with little vegetative diversity, located in a forested area. (P907, P908) Receives inflow via discrete flow from north sloping forest, and from drain D590 (outflow from wetland W590 to south). Outflow via channelized runoff to the north, out of corridor to stream S591, an unnamed tributary to Silver Creek. | E-5 |
| SVC124-W590 | W590 | PEM in forested area | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC124 | 87.49 | 0.04 | | Small, low value open water depressional PEM with approximately 10% vegetative cover.(P913, P914) Collects rainfall/surface runoff due to depressional character. Outflow via drain D590 to north, which drains to wetland W589 and then to stream S591, an unnamed tributary to Silver Creek. | E-5 |
| SVC124-W591 | W591 | PEM/PSS/PFO | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC124 | 87.49 | 0.71 | | Very large, high value PEM/PSS/PFO wetland, whose vegetated communities are intermixed and not well segmented. (P915, P916, P917, P918) High vegetative diversity and toxicant retention value (down gradient from cow pasture), high wildlife value. Inflow via stream S591 from south and via discrete surface flow. Outflow via S591, an unnamed tributary to Silver Creek. | E-4 and E-5 |
| SVC124-W592 | W592 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC124 | 87.49 | 0.09 | | Moderate size, low value PEM wetland with low vegetative diversity, located in a cow pasture. (P920, P921) Some pollutant retention value. Occurs along channel of stream S592, which provides culverted inflow on west end. Outflow east via stream S592, an unnamed tributary to Silver Creek. | E-2 |
| SVC124-W593 | W593 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC124 | 87.49 | 0.28 | | Moderate size, low value PEM wetland within channel of stream S592, within cow pasture. (P922, P923) Some pollutant retention value. Inflow via stream S592 from west. Outflow via stream S592 to east to wetland W592. If farm road did not exist, wetlands W592 and W593 would be same wetland. | E-2 |
| SVC122-W594 | W594 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Abutting | SVC122 | 42.31 | 0.09 | | Moderate size, low value PEM wetland, located in a cow pasture.(P924) Inflow is not immediately evident. Groundwater seep may exist east of Road 24 centerline. Outflow east out of corridor via channelized flow (P925), to an unnamed tributary to Silver Creek. (Wetland located in both SVC124 and SVC122 however it flows via S594 to SVC122) | E-2 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC117-W605 | W605 | PEM | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC117 | 25.28 | 0.05 | | Small, low value PEM wetland with low vegetative diversity, located within an active cow pasture. Inflow via discrete surface flow from west over gently sloping topography. Outflow via discrete surface flow to east. Outflow likely reaches drain D565 to wetland W565 before dissipating into groundwater given the slope of the land and close proximity to W565, which drains west to an unnamed tributary to Silver Creek. | E-5 |
| SVC116-PO1501 | PO1501 | POND | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC116 | 31.43 | | 0.03 | Natural vernal pool-like depression in forest. No vegetation present, water depth only 0-6" (P809). | E-5 |
| **Cluster 26 (Turbines T64, T65 and T66)** | | | | | | | | | | | |
| SVC109-W568 | W568 | PEM/PSS | Sector E/Cluster 26 (Turbines T64, T65 and T66) | Unnamed tributary to Silver Creek | Abutting | SVC109 | 25.45 | 0.28 | | Small, moderate to low value PEM/PSS wetland, with moderate vegetative diversity, located between agricultural fields. (P828) Wetland is riparian to Stream S568 (P829) which runs down middle. Inflow from surrounding area and outfall west of survey corridor. Outflow is to east through stream S568, an unnamed tributary to Silver Creek. Part of wetland goes briefly into forest with D568. Many Tricoptera larva in observed stream. | E-8 |
| **Cluster 27 (Turbines T61 and T62)** | | | | | | | | | | | |
| SVC103-W541 | W541 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC103 | 46.55 | 0.01 | | Small, moderate value PEM wetland, with moderate to low vegetative diversity. (P716) Located south of Route 39, to the west of wetland is an old agricultural field and to the east is forested. Receives inflow from drain D541 to west.(P718) D541 outflow to east out of survey corridor. Bordered on north by roadside ditch D541A that meets with D541 outside of project corridor. Ultimately reaching an Unnamed tributary to Silver Creek. | E-10 |
| SVC103-W542 | W542 | PEM/PSS | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC103 | 46.55 | 0.17 | | Moderate size, low value PEM/PSS with moderate vegetative diversity.(P721) PSS portion occurs in southern portion of wetland. Receives inflow via hillside runoff from west. Outflow on eastern side of wetland where surface runoff collects at culvert (P722) under Brunea's driveway. Culverted outflow becomes D541 which drains east through wetland W541 to unnamed tributary of SilverCreek. | E-10 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC106-W543 | W543 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Abutting | SVC106 | 31.76 | 0.36 | | Wetland is moderate to large PEM wetland with low value and vegetative diversity, primarily cattails. Wetland is divided at W543-4 to W543-5 (P727) and W543-11 to W543-18 (P728) by driveway(P730). Receives inflow is from stream S543 that comes from pond outside of the survey corridor. S543 (P729) runs down the west side of the driveway, then crosses under is east, and runs east into another stream outside of the survey corridor. Drains ultimately to an Unnamed tributary to Silver Creek. | E-10 and E-13 |
| SVC106-W544 | W544 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Abutting | SVC106 | 31.76 | 0.08 | | Small, low value wetland with moderate diversity. (P731, P732) Receives inflow via western slope runoff, roadside ditch drain D544 from south and stream S543 from southwest. Outflow northeast via S543, through wetland W543 and out of survey corridor, east to unnamed tributary to SilverCreek. | E-13 |
| SVC106-PO544 | PO544 | POND | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Abutting | SVC106 | 31.76 | | 0.25 | Moderate sized pond up-gradient from Wetland W544. (P1664, P1665)) | E-13 |
| SVC110-W545 | W545 | PFO | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Abutting | SVC110 | 33.59 | 0.20 | | Large, moderate wildlife and toxicant retention value, PFO wetland with high vegetative diversity. (P733) Receives inflow from south and east from up-gradient active corn field. Outflow northwest via streamS545 just outside survey corridor. Wetland W545 abuts stream S545 (P734), and contains wetland upland trees on small hummocks. Wetland ultimately drains to S1519, an unnamed tributary to Silver Creek. | E-11 |
| SVC107-W546 | W546 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC107 | 51.36 | 0.04 | | Small, low value PEM with little vegetative diversity. (P744) Located north of active corn field on the downward slope of hill sloping towards stream north of survey corridor. Receives surface sheet flow from the north and discharges into a muddy channel to the north, ultimately to Stream S1519, an unnamed tributary to Silver Creek. | E-11 |
| SVC73-W547 | W547 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC73 | 98.54 | 0.13 | | Medium size, low to moderate value PEM wetland with moderate vegetative diversity, located on slope south of farm road. (P745, P746) Receives inflow from agricultural field to north and groundwater. Outflow to stream S1520 at south end, ultimately to an unnamed tributary to Silver Creek. | E-12 and E-13 |
| SVC73-W548/W548a | W548/ W548a | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC73 | 98.54 | 0.01 | | Small low value PEM wetland, with little vegetative diversity, located in small depressional area. (P749, P750) Inflow and outflow not observed. Possible inflow from overland flow from adjacent up-gradient area. In close proximity to D1523, but depressional and not connected. | E-13 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC70-W549 | W549 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver CreekCreek | Adjacent with surface connection | SVC70 | 33.65 | 0.36 | | Moderate size and value PEM wetland with moderate vegetative diversity, abutting upland forested area. (P751, P753) High groundwater discharge/recharge function and value. Receives inflow from southwest via overland surface flow off up-gradient hillside drain D549 (P753, P754) and groundwater seepage. Discharge east via overland flow and direct connection to D549a. Drain flows to south then southeast which becomes a stream, an unnamed tributary to Silver Creek, outside survey corridor | E-13 |
| SVC70-W550 | W550 | PEM | Sector E/Cluster 27 (Turbines T61 and T62) | Unnamed tributary to Silver CreekCreek | Adjacent with surface connection | SVC70 | 33.65 | 0.14 | | Small sized, moderate valued PEM wetland, with moderate vegetative diversity, (P755, P756, P757) located on east facing slope, abutting upland forest to south and west. Receives inflow from overland sheet flow from the west and south, drainage from drain D550 to the southwest, and groundwater seepage. Outflow via groundwater recharge and discharge, and into wetland W549 via D 550 and overland sheet flow. Possible groundwater recharge as source for groundwater discharge in W549. | E-12 and E-13 |
| **Sector E Collection Line** | | | | | | | | | | | |
| **SVC103-W542: See Cluster 27** | | | | | | | | | | | |
| SVC129-W555 | W555 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC129 | 156.58 | 0.06 | | Small, moderate value PEM wetland with very low vegetative diversity. (P775) Moderate amphibian habitat, 1 egg mass, tadpoles observed. Receives inflow from surface water runoff from up-gradient. Active agricultural field to east. Outflow through drain D555 to west. D555 flows out of corridor and connects to wetland W554 via discrete flow (P776). ultimately reaches an Unnamed tributary to Silver Creek. | E-1 |
| SVC121-W558 | W558 | PEM (with open water component) | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC121 | 13.07 | 0.03 | | Small to moderate size, high amphibian habitat value PEM wetland with little vegetative diversity, with mostly water, 1 foot standing water. Located within active cow pasture. Receives inflow via surface runoff from southeast. Outflow northwest via drain D558 (P784) which drains to agricultural ditch (D558a) which drains north to stream S561, an unnamed tributary to Silver Creek. | E-1 |
| SVC121-W559 | W559 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC121 | 13.07 | 0.03 | | Small, low value PEM wetland, with little vegetative diversity, located in wet depression in active cow pasture. (P785) Inflow from hillside runoff from southeast. Outflow to northwest via D559, to D558a to stream 561, an unnamed tributary to Silver Creek. | E-1 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC121-W560 | W560 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC121 | 13.07 | 0.10 | | Small, low value PEM wetland, with little vegetative diversity, located within a cow pasture. (P787) Receives inflow via surface runoff from southeast. Outflow via drain D560, which is a 5 foot wide agricultural swale (P789). D560 drains northwest to D558a, which drains north to S561, an unnamed tributary to Silver Creek. | E-1 |
| SVC126-W561 | W561 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Abutting | SVC126 | 87.07 | 0.50 | | Large, moderate value PEM wetland, with moderate vegetative diversity Many fish and amphibians observed. High filtration value. Stream S561 receives in nutrient load from cow wastes. Wetland helps filter these loads from west via S561. (P794, P795, P796) Also hillside groundwater seepage on wetland. Outflow direct connection to S561, an unnamed tributary to Silver Creek. | E-1 |
| SVC122-W563 | W563 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC122 | 42.31 | 0.09 | | Small, low value PEM wetland, with little vegetative diversity, located in northeast corner of active pasture. (P798) Drains into stream S564 via drain D563 (P797)and overland flow to the north. Wetland receives recharge via overland flow from southwest and D563 to the south. Some function of groundwater discharge and recharge as well as wildlife (bird) habitat. S564 flows east towards S561 outside of survey corridor, ultimately to an unnamed tributary to Silver Creek. | E-1 |
| SVC122-W564 | W564 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Abutting | SVC122 | 42.31 | 0.07 | | Large, low value PEM riparian wetland, with little vegetative diversity, located in ephemeral stream and agricultural swale channel.(P800) Receives inflow from northwest and west from agricultural swale channels. Outflow east via stream S564,(P799) which channelizes at east edge of wetland W564 and flows east to S561, an unnamed tributary to Silver Creek. | E-1 |
| SVC103-W567 | W567 | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC103 | 46.55 | 0.17 | | Small, low function and value, PEM with moderate vegetative diversity, located on a wet southeast sloping hillside on active pasture land. (P812, P813) Receives inflow from surface water runoff from northeast up-gradient hillside, and possible groundwater upwelling. Outflow to southeast to wetland W542 via overland flow to ditch, to unnamed tributary to Silver Creek. | E-10 |
| SVC109-W569 | W569 | PEM/PFO 1/4 | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC109 | 25.45 | 2.63 | | Very large, high value PEM/PFO wetland, with high vegetiative diversity, that extends out of the corridor to the east and west.(P834- P837) Many open areas throughout the wetland. Many upland hummocks interspersed, many with hemlock. Inflow from ditches and groundwater, outflow through ditches. (P838, P839) | E-8 |

**Table 4 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC113-W570/W570a | W570/ W570a | PEM | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC113 | 44.85 | 0.10 | | Small, low value PEM, with moderate vegetative diversity, associated with historical logging ruts. (P840, P841) Inflow from surface water runoff from up-gradient hillside to southwest. Outflow to northeast via historical logging road ruts during rain events. Ruts lead to wetland W569 outside corridor. Ultimately to unnamed tributary to Silver Creek. | E-8 |
| SVC112-W571 | W571 | PFO | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC112 | 25.78 | 0.23 | | Small, low value, PFO wetland with moderate vegetative diversity, located in aforest, with pit and hummock topography.(P843, P844) Inflow is from up-gradient surrounding area. Outflow is to southeast via drain 571, which dries up outside of corridor. Only flowing during very high flow events. Drain D571 continues outside the corridor to an unnamed tributary to Silver Creek. | E-7 |
| SVC112-W572 | W572 | PEM in forested area | Sector E Collection Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC112 | 25.78 | 0.08 | | Moderate size, linear low value and diversity PEM wetland located in wooded area.(P845, P846) Occurs within an old logging road. Receives inflow via runoff from gently northeast sloping topography and via very minor drain D571 from W571 to north. Outflow east via D572 (P847) to an unnamed tributary to Silver Creek, outside of survey corridor, approximately 200 feet away. | E-7 |
| SVC118-PO1528 | PO1528 | POND | Sector E Collection Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC118 | 86.74 | | 0.02 | Small, low value pond located in cow pasture. (P902) Some juncus effusus, but not enough to be considered a wetland. Pond drains via Drain D1528 (P903) north outside of corridor, then goes to groundwater. (P1720, P1721, P1722) | E-3 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sector F Transmission line** | | | | | | | | | | | |
| WNC30-W50 | W50 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Abutting | WNC30 | 118.43 | 0.003 | | Small, low value PEM wetland with little vegetative diversity, located within forested area. (P269) Receives water via groundwater seep. Wetland drains south via overland flow to stream S50, an unnamed tributary to Walnut Creek. | F-9 |
| WNC30-W51 | W51 | PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC30 | 118.43 | 0.34 | | Large, moderate value, PFO wetland typified by pit and mound topography, with moderate vegetative diversity, located on slight north sloping hill.(P270, P271) Receives surface water runoff and drains to the north via multiple mapped drains (P272-P278) to unnamed tributary to Walnut Creek. | F-10 |
| WNC106-W52 | W52 | PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC106 | 61.28 | 0.02 | | Small, low value, PFO wetland, with little vegetative diversity, associated with drain D52.(P287, P288) Receives surface water runoff from stream S1014 and drains to the north into wetland W53 at wetland flag W53-19. Ultimately to unnamed tributary to Walnut Creek. | F-10 |
| WNC106-W53 | W53 | PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC106 | 61.28 | 0.31 | | Moderate size and value PFO wetland, with little vegetative divestiy, located at the base of a hill and separated from the railroad (abandoned) by an upland berm. (P291, P292) Receives surface water runoff via drain D1014 near wetland W53-19 (P289, P290), drain D53 near wetland W53-11 (P293), and up-gradient surface water runoff through minor pit and mound topography. Drains via drain D53a (P294) through a break in the berm near wetland W53-14 and then drains southwest to an unnamed tributary to Walnut Creek. | F-10 |
| WNC103-W54 | W54 | PEM/PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Abutting | WNC103 | 78.40 | 1.95 | | Large, high value PEM/PSS wetland (with forested components around periphery), with moderate vegetative diversity. (P306, P309, P311, P316, P317, P319, P320, P321) Receives surface water runoff primarily via streams S54 and S54a (P307, P308) as well as up-gradient runoff from northwest sloping hillside. Wetland highly distrubed, with large trash pile located within S54 and wetland W54 (P301, P302, P309). High wildlife value (Nesting Scolopax minor flushed), toxicant filtration, and amphibian habitat function and value. Drains to the northwest to an unnamed tributary to Walnut Creek. | F-11 and F-12 |
| WNC103-W56 | W56 | PEM/PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Abutting | WNC103 | 78.40 | 0.35 | | Moderate size and value PEM/PSS wetland, with moderate vegetative diversity, associated with and extending beyond (north) the banks of stream S56. (P325, P327, P328)) Receives surface water runoff via drains D56 and D56a and then drains to the south via discrete overland flow to stream S56 near stream point S56-10 (P326). | F-12 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WNC103-W57 | W57 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Abutting | WNC103 | 78.40 | 0.63 | | Large, moderate value PEM wetland with low vegetative diversity. (P329, P330) Down-gradient from stream S54 culvert outflow where the stream loses its channel and drains as obvious overland flow west to stream S56 within gas line Right-of-Way. Ultimately to unnamed tributary to Walnut Creek. | F-12 |
| SVC22-W58 | W58 | PSS/PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC22/ SVC21/ WNC11 | 46.05/ 35.89/ 44.12 | 1.41 | | Large, high value PSS/PFO wetland, with high vegetative diversity, located down-gradient from pond PO58. (P333, P334, P335, P337) Receives surface water runoff and drainage from PO58 via drain D58 and drains D58a and D58b (all breaches in beaver dam) (P332). High groundwater recharge and discharge, and wildlife habitat function and values. Drains to the north via drains D58a, D58b, and D58c which presumably flow to an unnamed tributary to Silver Creek. | F-13 |
| SVC22-W59 | W59 | PSS | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC22 | 46.05 | 0.08 | | Small, low value PSS wetland, with moderate vegetative diversity, located in a natural depression. (P339, P340, P341) Receives surface water runoff and via drain D58b (P338). Drains to the north via drain D58b to wetland W60 and ultimately to an unnamed tributary to Silver Creek. | F-13 |
| SVC22-W60 | W60 | PEM/PSS/PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC22/ SVC23 | 46.05/ 101.13 | 2.63 | | Large, high value PEM/PSS/PFO wetland, with high vegetative diversity. (P346, P347, P378, P349, P350, P351) Eastern portion contains a NYS DEC mapped stream running through it. Western (P343, P344) and northern portions are PFO and southern portion is PSS. Receives inflow mainly from the south and from many other mapped drains throughout the wetland. Outflow is primarily to the north into stream S60. (P345) | F-13 |
| SVC23-W61/SVC18-W61a | W61/ W61a | PEM/PSS/PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Abutting | SVC23 and SVC18 | 101.13 and 51.69 | 1.29 | | Large, high value, PEM/PSS/PFO wetland, with high vegetative diversity, located within the banks of stream S60 (P356) until it widens out into a much broader wetland complex north of wetland flags W61-105 and W61-5.(P358, P359, P360, P361) High groundwater recharge and discharge, wildlife habitat function and values. Inflow from south via stream S60 and from the east via drains D61 and D61a. Wetland W61 as well as stream S60 continues to the north beyond the corridor presumably reaching an unnamed tributary to Silver Creek. That northeastern portion overlaps into NYS DEC mapped wetland SC-13. | F-14 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC23-W62 | W62 | PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC23 | 101.13 | 0.05 | | Small, low value PFO wetland with moderate vegetative diversity, located in a natural depression of a Acer rubrum forest.(P354) Receives surface water runoff from surrounding up-gradient areas and drains to the adjacent wetland W61 / stream S60 complex via drain D62. This wetland does not overlap with NYS DEC wetland SC-13 but drain D62 is a hydrological connection to wetland W61 which does overlap with NYS DEC wetland SC-13. | F-14 |
| SVC23-W63 | W63 | PEM | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC23 and SVC18 | 101.13 and 51.69 | 0.34 | | Small, low value PEM wetland, with little vegetative diversity, located in a reverting agricultural field. (P362) Inflow is surface water runoff from surrounding up-gradient areas primarily to the east and via drains D63 and D63a. Drains to the north via discrete overland flow to wetland W60 ultimately reaching an unnamed tributary to Silver Creek. This wetland does overlap with NYS DEC wetland SC-13 slightly in the northwestern corner (wetland flag W63-8). It then drains into wetland W64 which about 50% of is overlapped with NYS DEC wetland SC-13. | F-14 |
| SVC23-W64 | W64 | PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC23 | 101.13 | 0.19 | | Moderate size and value PFO1, with moderate vegetative diversity, located in natural depression in forested area.(P364) Receives surface water runoff and discrete overland flow from wetland W63, and from drain D64 near wetland flag W64-3. The wetland extends west and also drains to the west via drain D64 (P363) beyond the survey corridor into an unnamed tributary to Silver Creek. Approximately 50% of this wetland is overlapped with NYS DEC wetland SC-13 to the west. This wetland may connect to wetland W61 outside the survey corridor. | F-14 |
| SVC23-W65 | W65 | PSS/PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC23 and SVC18 | 101.13 and 51.69 | 0.99 | | Moderate to large size, moderate to low value PFO1 wetland (pit and mound topography), with high vegetative diversity, located in natural depression in forested area. (P365, P366, P367, P368, )369) Receives surface water runoff and discrete overland flow from surrounding up-gradient areas and the adjacent reverting agricultural field to the east. Drains to the south into wetland W64 during moderate to heavy rain events. Additional drainage to the west via discrete overland flow near wetland flag W65-37. Many large depressional areas throughout with water-stained leaves but no vegetation. This wetland does not overlap with NYS DEC wetland SC-13. However there is a direct surface connection to wetland W64 which does overlap with NYS DEC wetland SC-13. | F-14 and F-15 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WNC85-W66 | W66 | PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC50, WNC84, WNC85 and WNC86 | 100.70, 30.39, 36.59 and 77.91 | 0.63 | | Moderate sized and value PSS wetland with moderate vegetative diversity. (P374, P375, P377) Receives surface water runoff from up-gradient wetland outside the survey corridor and flows to the south to pond PO66 (P379). No surface connection to traditionally navigable waters to the south. Although may drain (P376) to the north into the roadside ditch along the south side of Hopper Road then flowing northwest and through a culvert connecting it to an unnamed tributary to Walnut creek. | F-6 |
| WNC89-W67 | W67 | PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC89 | 27.53 | 0.74 | | Large, moderate value PFO wetland, with moderate vegetative diversity, located on top of a slightly north sloping hill. (P387, P388, P389, P390) Receives surface water runoff from up-gradient areas and drains to the north via discrete overland flow to drain D1017 and to the west to an unnamed tributary to Walnut Creek. High groundwater recharge and discharge and wildlife habitat function and value. | F-5 |
| WNC91-W68 | W68 | PSS/PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC89 and WNC 91 | 27.53 and 54.01 | 0.24 | | Small, moderate value PSS/PFO with moderate vegetative diversity, located on slightly northwest sloping hillside. (P391, P392) Receives surface water runoff from up-gradient areas and drains northwest via discrete overland flow to drain D1017 (P380, P381) and ultimately to an unnamed tributary of Walnut Creek. Moderate groundwater recharge and discharge habitat function and values. | F-5 |
| WNC91-W69 | W69 | PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC89 and WNC 91 | 27.53 and 54.01 | 1.54 | | Large, high value PSS wetland, with moderate vegetative diversity. located within a forested area. (P393-P399, P402, P403) Receives surface water runoff from up-gradient areas, via drains D69 (P400, P405, P407) and D69a, and large groundwater seep (P406) east of wetland flag W69-118. Drains to the northwest via discrete overland flow, also to drain D68 into wetland W68, and from near wetland flag W69-26 beyond the survey corridor to an unnamed tributary of Walnut Creek. | F-5 |
| WNC91-W70 | W70 | PEM in forested area. | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC91 | 54.01 | 0.19 | | Small, low value PEM with little vegetative diversity associated with inundated ruts within an ATV trail (P408, P409, P411, P413). Receives surface water runoff from up-gradient areas and drains out both east and west ends of the wetland via overland flow into wetland W69 ultimately reaching an unnamed tributary of Walnut Creek. | F-5 |
| WNC88-W71 | W71 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC88 and WNC89 | 69.54 and 27.53 | 0.09 | | Small, moderate value PEM with very low vegetative diversity, located in a natural depression within a reverting agricultural field.(P414) Receives surface water runoff from up-gradient areas and drains northeast via discrete overland flow during high flow events to drain D72a beyond the survey corridor. Moderate groundwater recharge and discharge function and value. | F-4 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WNC88-W72 | W72 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC88 | 69.54 | 0.30 | | Moderate size and value, linear PEM wetland, with low vegetative diversity, associated with a drainage swale within a reverting agricultural field.(P416, P417) Receives surface water runoff from up-gradient areas as well as from drain D72a (P418) beyond the south end of the survey corridor. Drains north via drain D72a to an unnamed tributary to Walnut Creek. Moderate groundwater recharge and discharge and wildlife habitat function and values. | F-4 |
| WNC88-W73 | W73 | PEM/PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC88 | 69.54 | 0.05 | | Small, low value PEM/PSS, with low vegetative diversity, associated with a natural depression within a reverting agricultural field. (P419) Receives surface water via drain D73 and adjacent up-gradient areas. Drains north via drain D73 beyond the survey corridor to drain D72a, presumably to an unnamed tributary to Walnut Creek. | F-4 |
| WNC47-W103 | W103 | PEM/PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC47 | 28.80 | 0.38 | | Moderate size and value, depressional PEM/PSS wetland with low vegetative diversity. (P536. P534) Moderate wildlife habitat function and value. Inflow from surrounding up-gradient areas and drains to the north into stream S103 via drain D103a. Ultimately reaching an unnamed tributary to Walnut Creek. | F-7 |
| WNC43-W104 | W104 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC 30, WNC 32, WNC 33, WNC 37, WNC38 and WNC 43 | 118.43, 45.33, 34.59, 34.53, 45.23 and 58.34 | 9.98 | | Large, moderate value PEM wetland, with moderate vegetative diversity, located within historic logging ruts. (P570, P571, P1683, P1686) Depressional wetland that receives water from up-gradient north slope surface water runoff. Drains to the north via drain D104e and to the west via drains D104 and D014b to stream S103, (P1684, P1685)an unnamed tributary to Walnut Creek. Wetland is locating in several watersheds however wetland likely drains to watershed WNC43. | F-7, F-8 and F-9 |
| WNC59-W105 | W105 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC59 | 70.18 | 1.17 | | Large, moderate value, linear PEM wetland, with low vegetative diversity. (P1578, P1580) Wetland runs from western corridor edge in old growth forest downstream through junkyard (P1579) with cars to the east boundary. Car junk yard has vehicles in wetland areas. Some leaking petroleum products. Drains to east to unnamed tributary to Walnut Creek. | F-3 |
| WNC59-W106 | W106 | PEM | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC59 | 70.18 | 0.51 | | Large, low to moderate value linear PEM wetland. Wetland flows from west to the east through the entire corridor; located adjacent to car junk yard and old growth forest consisting of hemlocks, beech and maple. Some cars from the junk yard are within the wetland, leaking petroleum products. | F-3 |
| TUC25-W107 | W107 | PEM/PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | TUC25 | 75.47 | 1.85 | | Large, moderate value PEM/PSS wetland with low vegetative diversity.(P1584) Area has been impacted by logging activities (P1583). Drains to large wet prairie to west, ultimately to unnamed tributary to Walnut Creek. | F-3 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TUC6-W108 | W108 | PEM | Sector F Transmission Line | Unnamed tributary to Tupper Creek | Abutting | TUC6 | 35.15 | 0.67 | | Small, high value riparian PEM wetland with moderate vegetative diversity. (P1585) Wetland has a medium sized pond area that drains down the side of a hill creating an elongated wetland, then comes to stream S108 (P1586) that flows southwest to an unnamed tributary to Tupper Creek. | F-1 |
| TUC8-W109 | W109 | PEM | Sector F Transmission Line | Unnamed tributary to Tupper Creek | Adjacent with surface connection | TUC8 | 32.04 | 0.76 | | Large, low to moderate value, PEM/PSS weltand with low vegetative diversity. Wetland begins in cattle pasture and flows east into red maple and vibernum area with herbs and grasses. Ultimately drains to unnamed tributary to Tupper Creek. | F-1 |
| SVC18-W110 | W110 | PEM/PFO 1/4 | Sector F Transmission Line | No apparent surface water connection to traditional navigable waters | Adjacent without surface connection | SVC18 | 51.69 | 1.43 | | Small to medium sized, low value, PFO/PEM wetland with pit and mound topography and little vegetative diversity. Majority of wetland lies within NYS DEC Wetland SC-12. Therefore this wetland is under the jurisdiction of NYSDEC. | F-15 |
| SVC16-W111 | W111 | PFO | Sector F Transmission Line | Unnamed tributary to Silver Creek | Adjacent with surface connection | SVC11/ SVC23 | 26.84/ 101.13 | 3.39 | | Large, low to moderate value PFO wetland typified by pit and mound topography, with little vegetative diversity. Flows west and northwest. Moderate to high value with high vegetative diversity and functionality. Majority of wetland lies within NYS DEC Wetland SC-12. Therefore wetland is under the jurisdiction of the NYSDEC. | F-15 and F-16 |
| TUC25-W125 | W125 | PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | TUC25 | 75.47 | 1.00 | | Moderate size, high value, PFO1 with high vegetative diversity; located near top of southwest sloping hill. (P1666, P1667, P1668, P1669, P1671) Receives water via surface water runoff from upland adjacent areas and from groundwater seepage at northeast (W125-1).(P1670) Wetland extends southwest beyond survey corridor with probably connection to unnamed tributary to Walnut Creek. High wildlife and groundwater recharge/discharge function and value. | F-2 |
| TUC25-W126 | W126 | PFO | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | TUC25 | 75.47 | 0.04 | | Mapped portion is the western end of a moderate to large size, moderate value PFO, with high vegetative diversity; which extendst northeast beyond survey corridor. Receives water via groundwater seepage and surface water runoff fro up-gradient areas. Drains west via drain D126 (P1672, P1674) to Wetland W127 (an historic logging road that interrupts flow). Drain continues west and reverts to discrete overland flow and drain D126 (P1673), to an unnamed tributary to Walnut Creek. | F-2 |
| TUC25-W127 | W127 | PEM in forested area. | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | TUC25 | 75.47 | 0.03 | | Small, low value PEM, with little vegetative diversity; associated with wet logging road in upland forest. (P1675) Receive water via drain D126 (P1676) (from upgradient W126) and surface water runoff. Drains west via drain D126 and reverts to discrete overland flow at adjacent logging road, ultimately reaching and unnamed tributary to Walnut Creek beyond survey corridor. | F-2 |

**Table 5 Summary of Delineated Wetland Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Wetland Community Type | Sector/ Cluster | Hydrologic Connection | Location Relative to Associated Stream Reach (Adjacent or Abutting)[1] | Watershed | Stream Reach Drainage Area (acres) | Area of Wetland Within the Survey Corridor (acres) | Area of Pond Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WNC87-W606 | W606 | PEM/PSS | Sector F Transmission Line | Unnamed tributary to Walnut Creek | Adjacent with surface connection | WNC87 | 31.98 | 2.50 | | Large size, low to moderate value, PEM/PSS wetland with high vegetative diversity. (P1002, P1003) Connects to Wetland W607 and which ultimately flows to Stream S607, an unnamed tributary of Walnut Creek. | F-3 and F-4 |
| WNC92-W607 | W607 | PEM in forested area. | Sector F Transmission Line | Unnamed tributary of Walnut Creek | Abutting | WNC59, WNC87 and WNC92 | 70.18, 31.98 and 51.72 | 1.66 | | Large, moderate to high value, PEM wetland with moderate vegetative diversity; (P1004, P1005) located within a forested area and adjacent to W606, connecting beyond survey corridor. Inflow and outflow via stream S607 (P1006, P1007) and S607a(P1008), an unnamed tributary to Walnut Creek. | F-3 |

**Table 6 Summary of NYSDEC Jurisdictional Wetlands**

| NYSDEC Wetland ID | Wetland ID | Wetland Community Type | Hydrologic Connection | Watershed | Area of Wetland Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|
| SC-13 | SVC22-W59 | PSS | Unnamed tributary to Silver Creek | SVC22 | 0.0758 | Small, low value PSS wetland, with moderate vegetative diversity, located in a natural depression. (P339, P340, P341) Receives surface water runoff and via drain D58b (P338). Drains to the north via drain D58b to wetland W60 and ultimately to an unnamed tributary to Silver Creek. | F-4 |
| SC-13 | SVC22-W60 | PEM/PSS/PFO | Unnamed tributary to Silver Creek | SVC22/ SVC23 | 2.6254 | Large, high value PEM/PSS/PFO wetland, with high vegetative diversity. (P346, P347, P378, P349, P350, P351) Eastern portion contains a NYS DEC mapped stream running through it. Western (P343, P344) and northern portions are PFO and southern portion is PSS. Receives inflow mainly from the south and from many other mapped drains throughout the wetland. Outflow is primarily to the north into stream S60. (P345) | F-13 |
| SC-13 | SVC23-W61/SVC18-W61a | PEM/PSS/PFO | Unnamed tributary to Silver Creek | SVC23 and SVC18 | 1.2933 | Large, high value, PEM/PSS/PFO wetland, with high vegetative diversity, located within the banks of stream S60 (P356) until it widens out into a much broader wetland complex north of wetland flags W61-105 and W61-5.(P358, P359, P360, P361) High groundwater recharge and discharge, wildlife habitat function and values. Inflow from south via stream S60 and from the east via drains D61 and D61a. Wetland W61 as well as stream S60 continues to the north beyond the corridor presumably reaching an unnamed tributary to Silver Creek. That northeastern portion overlaps into NYS DEC mapped wetland SC-13. | F-14 |
| SC-13 | SVC23-W62 | PFO | Unnamed tributary to Silver Creek | SVC23 | 0.0464 | Small, low value PFO1 wetland with moderate vegetative diversity, located in a natural depression of a Acer rubrum forest.(P354) Receives surface water runoff from surrounding up-gradient areas and drains to the adjacent wetland W61 / stream S60 complex via drain D62. This wetland does not overlap with NYS DEC wetland SC-13 but drain D62 is a hydrological connection to wetland W61 which does overlap with NYS DEC wetland SC-13. | F-14 |

**Table 6 Summary of NYSDEC Jurisdictional Wetlands**

| NYSDEC Wetland ID | Wetland ID | Wetland Community Type | Hydrologic Connection | Watershed | Area of Wetland Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|
| | SVC23-W63 | PEM | Unnamed tributary to Silver Creek | SVC23 and SVC18 | 0.3361 | Small, low value PEM wetland, with little vegetative diversity, located in a reverting agricultural field. (P362) Inflow is surface water runoff from surrounding up-gradient areas primarily to the east and via drains D63 and D63a. Drains to the north via discrete overland flow to wetland W60 ultimately reaching an unnamed tributary to Silver Creek. This wetland does overlap with NYS DEC wetland SC-13 slightly in the northwestern corner (wetland flag W63-8). It then drains into wetland W64 which about 50% of is overlapped with NYS DEC wetland SC-13. | F-14 |
| SC-13 | SVC23-W64 | PFO | Unnamed tributary to Silver Creek | SVC23 | 0.1889 | Moderate size and value PFO1, with moderate vegetative diversity, located in natural depression in forested area.(P364) Receives surface water runoff and discrete overland flow from wetland W63, and from drain D64 near wetland flag W64-3. The wetland extends west and also drains to the west via drain D64 (P363) beyond the survey corridor into an unnamed tributary to Silver Creek. Approximately 50% of this wetland is overlapped with NYS DEC wetland SC-13 to the west. This wetland may connect to wetland W61 outside the survey corridor. | F-14 |

**Table 6 Summary of NYSDEC Jurisdictional Wetlands**

| NYSDEC Wetland ID | Wetland ID | Wetland Community Type | Hydrologic Connection | Watershed | Area of Wetland Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|
| SC-13 | SVC23-W65 | PSS/PFO | Unnamed tributary to Silver Creek | SVC23 and SVC18 | 0.9888 | Moderate to large size, moderate to low value PFO1 wetland (pit and mound topography), with high vegetative diversity, located in natural depression in forested area. (P365, P366, P367, P368, )369) Receives surface water runoff and discrete overland flow from surrounding up-gradient areas and the adjacent reverting agricultural field to the east. Drains to the south into wetland W64 during moderate to heavy rain events. Additional drainage to the west via discrete overland flow near wetland flag W65-37. Many large depressional areas throughout with water-stained leaves but no vegetation. This wetland does not overlap with NYS DEC wetland SC-13. However there is a direct surface connection to wetland W64 which does overlap with NYS DEC wetland SC-13. | F-14 and F-15 |
| SC-12 | SVC18-W110 | PEM/PFO 1/4 | No apparent surface water connection to traditional navigable waters | SVC18 | 1.4283 | Small to medium sized, low value, PFO/PEM wetland with pit and mound topography and little vegetative diversity. Majority of wetland lies within NYS DEC Wetland SC-12. Therefore this wetland is under the jurisdiction of NYSDEC. | F-15 |
| SC-12 | SVC10-W111 | PFO | Unnamed tributary to Silver Creek | SVC11/ SVC23 | 3.3904 | Large, low to moderate value PFO wetland typified by pit and mound topography, with little vegetative diversity. Flows west and northwest. Moderate to high value with high vegetative diversity and functionality. Majority of wetland lies within NYS DEC Wetland SC-12. Therefore wetland is under the jurisdiction of the NYSDEC. | F-15 and F-16 |

**Table 6 Summary of NYSDEC Jurisdictional Wetlands**

| NYSDEC Wetland ID | Wetland ID | Wetland Community Type | Hydrologic Connection | Watershed | Area of Wetland Within the Survey Corridor (acres) | Additional Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|
| None | WNC43-W104 | PEM | Unnamed tributary to Walnut Creek | WNC 30, WNC 32, WNC 33, WNC 37, WNC38 and WNC 43 | 9.9820 | Large, moderate value PEM wetland, with moderate vegetative diversity, located within historic logging ruts. (P570, P571, P1683, P1686) Depressional wetland that receives water from up-gradient north slope surface water runoff. Drains to the north via drain D104e and to the west via drains D104 and D014b to stream S103, (P1684, P1685)an unnamed tributary to Walnut Creek. Wetland is locating in several watersheds however wetland likely drains to watershed WNC43. | F-7, F-8 and F-9 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Streams Identified During Surveys Within the Project Area** | | | | | | | | | | | | | | |
| **Sector A** | | | | | | | | | | | | | | |
| **Cluster 1 (Turbines T1, T2 and T3)** | | | | | | | | | | | | | | |
| WBC33-S81 | S81 | Sector A/Cluster 1 (Turbines T1, T2 and T3) | 0-3 | 2 | 5 | Silt/Clay | Perrenial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC33 | 65.32 | Small P-RPW flowing west between fallow agricultural field and upland forest. Riparian wetland W81 is mapped within the banks. Flows to an unnamed tributary to West Branch Conewango Creek. (P493, P494, P455, P456) | A-1 |
| WBC28-S83 | S83 | Sector A/Cluster 1 (Turbines T1, T2 and T3) | 3-6 | 3 | 12-15 | Gravel | Perrenial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC28 | 59.14 | Stream starts from wetland W83 where wetland narrows and becomes more channelized. It continues to the southwest beyond the survey corridor to an unnamed tributary to West Branch Conewango Creek. (P463, P464, P478, P479) | A-1 |
| WBC46-S86 | S86 | Sector A/Cluster 1 (Turbines T1, T2 and T3) | 3-6 | 3 | 30-40 | Silt/Clay | Perrenial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC46 | 67.17 | Small channelized stream through upland forest blows out into riparian wetland (stream flows west). (P484, P485, P486) | A-2 |
| **Cluster 2 (Turbine T4)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Cluster 3 (Turbines T5 and T6)** | | | | | | | | | | | | | | |
| WBC77-S75 | S75 | Sector A/Cluster 3 (Turbines T5 and T6) | 0-3 | 2 | 3 | Gravel | Intermittent | S-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC77 | 54.87 | Stream starts as drain D75 flowing southwest from and up-gradient agricultural field. Apparent dumping of fieldstones where drain transitions into a stream. (P429, P430, P431, P432) | A-4 |
| **Sector A Collection Line** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Sector B** | | | | | | | | | | | | | | |
| **Cluster 4 (Turbine T7)** | | | | | | | | | | | | | | |
| WBC72-S92 | S92 | Sector B/Cluster 4 (Turbine T7) | 0-3 | 2 | 3 | Silt/Clay | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC72 | 114.67 | Perennial stream associated with riparian wetland W92 along banks, down gradient from agricultural field. (P1511, P1512) | B-1 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cluster 5 (Turbines T8, T9 and T10)** | | | | | | | | | | | | | | |
| WBC88-S98 | S98 | Sector B/Cluster 5 (Turbines T8, T9 and T10) | 3-6 | 2 | 12 | Gravel | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC88 | 53.95 | Perennial stream associated with wetland W98 flowing south along the survey corridor. (P1529) | B-4 |
| **Cluster 6 (Turbines T11, T13 and T14)** | | | | | | | | | | | | | | |
| WBC101-S101 | S101 | Sector B/Cluster 6 (Turbines T11, T13 and T14) | 0-3 | 2 | 4-6 | Silt/Clay | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC101 | 37.12 | Northeast flowing stream within wetland W101. Begins as drain with high, dense vegetation (Solidago, Juncus). Begins to channel into stream and continues outside survey corridor. P1556, P1556a, P1601, P1603 | B-5 and B-6 |
| **Cluster 7 (Turbines T16 and T17)** | | | | | | | | | | | | | | |
| WBC103-S1535 | S1535 | Sector B/Cluster 7 (Turbines T16 and T17) | 0-3 | 1-3 | 5 | Gravel, Silt/Clay | Ephemeral | S-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC103 | 200.68 | Ephemeral stream, datapoint (point closest to road centerline) is a headwaters of stream, at groundwater seep. (P982, P983) | B-7 |
| **Cluster 8 (Turbine T68)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Cluster 9 (Turbines T18, T19, T20 and T21)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Sector B Collection Line** | | | | | | | | | | | | | | |
| WBC90-S598 | S598 | Sector B Collection Line | 0-3 | 10 | 10 | Bedrock, Gravel | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC90 | 70.41 | Perennial stream, trash pile to the north has significant runoff into stream when precipitation is present. (P953, P954, P955) | B-10 |
| WBC103-S602 | S602 | Sector B Collection Line | 0-3 | 3-10 | 5-20 | Gravel, Silt/Clay | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC103 | 200.68 | Perennial stream, associated with riparian wetland W602 within its banks. (P964, P965, P966, P967) | B-9 |
| **Sector C** | | | | | | | | | | | | | | |
| **Cluster 10 (Turbine T25)** | | | | | | | | | | | | | | |
| WBC130-S526 | S526 | Sector C/Cluster 10 (Turbine T25) | 0-3 | 4 | 7 | Gravel | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC130 | 16.04 | Perennial stream, associated with riparian wetland W526 and abuts W525 to the north. Stream flows south at edge of turbine buffer. (P605, P606) | C-1 |
| **Cluster 11 (Turbines T23 and T24)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cluster 12 (Turbine T22)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Cluster 13 (Turbine T26)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Cluster 14 (Turbine T27)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Cluster 15 (Turbine T29)** | | | | | | | | | | | | | | |
| WBC21-S1501 | S1501 | Sector C/Cluster 15 (Turbine T29) | 3-6 | 2-5 | 5-15 | Bedrock, Gravel, Cobble | Intermittent | S-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC21 | 63.04 | Forested stream at data point (Tsuga Canadensis, Acer rubrum, Prunus serotina). (P614, P615) | C-8 |
| **Cluster 16 (Turbines T30, T31 and T32)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Cluster 17 (Turbines T33, T34 and T35)** | | | | | | | | | | | | | | |
| WBC47-S1509 | S1509 | Sector C/Cluster 17 (Turbines T33, T34 and T35) | 0-6 | 0 | 8 | Gravel, Cobble | Intermittent | S-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC47 | 31.24 | Drain D1509 leads to stream S1509, D1509 definitely man made drain (makes 90° angle) to drain agricultural fields to S1509. Downstream there is flow, mayflies. (P653, P654) | C-10 |
| WBC74-S1514 | S1514 | Sector C/Cluster 17 (Turbines T33, T34 and T35) | 0-3 | 2-8 | 5-12 | Gravel, Silt/clay, Cobble | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC74 | 41.22 | Stream originates at groundwater seeps off of a agricultural field. Drains D1514 and D1514a come into stream towards edge of survey corridor. (P663, P664) | C-12 |
| **Cluster 18 (Turbine T36)** | | | | | | | | | | | | | | |
| No Streams | | | | | | | | | | | | | | |
| **Sector C Collection Line** | | | | | | | | | | | | | | |
| WBC45-S530 | S530 | Sector C Collection Line | 0-3 | 1-3 | 1-4 | Silt/clay | Intermittent | S-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC45 | 96.78 | Stream S530 begins as drain D530 northeast of Pond PO530, it then flows out of PO530 as a stream and cuts through wetland W530 continuing south to unnamed tributary to West Branch Conewango Creek. (P627) | C-10 |
| S1509-See Cluster 17 | | | | | | | | | | | | | | |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sector D** | | | | | | | | | | | | | | |
| **Cluster 19 (Turbine T38)** | | | | | | | | | | | | | | |
| WBC107-S533 | S533 | Sector D/Cluster 19 (Turbine T38) | 0-3 | 2.5-6 | 2-5 | Silt/Clay | Perennial | P-RPW | C | Unnamed tributary to West Branch Conewango Creek | WBC107 | 159.72 | Small stream meanders along side of old agricultural field. Runs under road through culvert. There is an abundance of algal growth in the stream. (P674) | D-1 |
| NBC69-S534 | S534 | Sector D/Cluster 19 (Turbine T38) | 0-3 | 1 | 12 | Gravel, Silt/Clay | Perennial | P-RPW | C | Unnamed tributary to North Branch Conewango Creek | NBC69 | 82.84 | Perennial stream, associated with riparian wetland W534. Stream S534 appears to drain the NWI wetland to the north, outside of survey corridor (portions mapped as W534a). (P678, P679) | D-2 |
| **Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45)** | | | | | | | | | | | | | | |
| NBC69-S534- See Cluster 19 | | | | | | | | | | | | | | |
| NBC57-S44 | S44 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | 0-3 | 18" | 4-6 | Gravel | Intermittent | S-RPW | C | Unnamed tributary to North Branch Conewango Creek | NBC57 | 30.47 | Stream starts as broad vegetated swale up gradient from wetland W44. Drain becomes channelized at W44 and turns into a channelized stream with defined bed and bank at W44-104. Flows north beyond survey corridor at stream S44-12. (P235, P236) | D-5 |
| NBC55-S46 | S46 | Sector D/Cluster 20 (Turbines T39, T40, T41, T42, T43 and T45) | 0-3 | 4-5 | 10-12 | Gravel | Perennial | P-RPW | C | Unnamed tributary to North Branch Conewango Creek | NBC55 | 63.81 | Perennial RPW stream, associated with riparian wetland W46, within the banks of S46. (P239, P240, P241, P242) | D-5 |
| **Cluster 21 (Turbines T46 and T47)** | | | | | | | | | | | | | | |
| NBC46-S31 | S31 | Sector D/Cluster 21 (Turbines T46 and T47) | 0-3 | 1-2 | 2-4 | Gravel, large flat stone | Perennial | P-RPW | C | Unnamed tributary to North Branch Conewango Creek | NBC46 | 162.04 | Small stream with riparian corridor making up wetland W31. Active agricultural fields to the northeast and southwest. Point source pollution coming from drain tile that is draining agricultural field to the southwest. High nutrient load and some littler present. Otherwise stream appears healthy with high floodplain and wildlife value and function. (P181, 182, 183) | D-8 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cluster 22 (Turbines T48, T50 and T51)** | | | | | | | | | | | | | | |
| SVC138-S16 | S16 | Sector D/Cluster 22 (Turbines T48, T50 and T51) | 0-3 | 2 | 4 | Gravel | Intermittent | S-RPW | A[2] | Unnamed tributary to Silver Creek | SVC138 | 54.77 | Small S-RPW draining north from Wetland W16 (channelization starts near W16-18) to an unnamed tributary of Silver Creek. (P96) | D-13 |
| **Cluster 23 (Turbines T52, T53 and T55)** | | | | | | | | | | | | | | |
| SVC133-S1000 | S1000 | Sector D/Cluster 23 (Turbines T52, T53 and T55) | 0-3 | 4-5 | 6-8 | Gravel | Perennial | P-RPW | A[2] | Unnamed tributary to Silver Creek | SVC133 | 87.19 | Perennial stream, an unnamed tributary to Silver Creek. (P04, PO5) | D-17 |
| SVC133-S1002 | S1002 | Sector D/Cluster 23 (Turbines T52, T53 and T55) | 0-3 | 1-2 | 12-15 | Silt/clay | Perennial | P-RPW | A[2] | Unnamed tributary to Silver Creek | SVC133 | 87.19 | Small, perennial stream, flows east at Access Road 21. (P33, P34, P35) | D-18 |
| SVC136-S7 | S7 | Sector D/Cluster 23 (Turbines T52, T53 and T55) | 0-3 | 1 | 12-16" | Gravel, silt/clay | Ephemeral | Non-RPW | A[2] | Unnamed tributary to Silver Creek | SVC136 | 60.55 | Stream S7, a small ephemeral stream, beyond survey corridor. Wetland W7 drains north northwest to stream S7. (P44, P45) | D-15 |
| **Sector D Collection Line** | | | | | | | | | | | | | | |
| NBC39-S9 | S9 | Sector D Collection Line | 3-6 | 4 | 6-8 | Gravel | Perennial | P-RPW | C | Unnamed tributary to North Branch Conewango Creek | NBC39 | 38.70 | Stream S9 is a perennial stream, flowing east, associated with riparian wetland W9. (P55, P56) | D-16 |
| SVC140-S22 | S22 | Sector D Collection Line | 0-3 | 2 | 3 | Silty with other sediments | Perennial | P-RPW | A[2] | Unnamed tributary to Silver Creek | SVC140 | 67.74 | Stream S22 is a perennial stream which flows northeast beyond survey corridor into larger wetland complex. Stream is associated with riparian wetland W22, within the banks of S22. (P115, P116, P117) | D-14 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC140-S123 | S123 | Sector D Collection Line | 0-3 | 1-3 | 2-5 | Gravel, Silt/clay | Perennial | P-RPW | A[2] | Unnamed tributary to Silver Creek | SVC140 | 67.74 | Small stream flowing northwest through wet logging road (Wetland W123) into stream S22. (P1654, P1655, P1656) | D-14 |
| SVC129-S1001/S551 | S1001/S551 | Sector D Collection Line | 0-3 | 4-6 | 7-10 | Gravel, Silt/Clay, Cobble | Perrenial | P-RPW | A[2] | Unnamed tributary to Silver Creek | SVC129 | 156.58 | Stream S1001 drains north to culverted road. Stream comes off wetland W4 and goes north to unnamed tributary to Silver Creek. (P18, P19). Stream S551 begins at culvert and abuts wetland W551 on its east border. Japanese knotweed (invasive) grows on east bank. (P765, P766, P767) | D-19 |
| SVC129-S1001a | S1001a | Sector D Collection Line | 0-3 | 18' | 2-3 | Gravel, Sand, Silt/Clay | Intermittent | S-RPW | A[2] | Unnamed tributary to Silver Creek | SVC129 | 156.58 | Stream S1001A starts as a groundwater seep and drains northeast to S1001 ~100 feet away.(P265) | D-19 |
| **Sector E** | | | | | | | | | | | | | | |
| **Cluster 24 (Turbine T56)** | | | | | | | | | | | | | | |
| SVC129-S1001/S551-see Sector D Collection | | | | | | | | | | | | | | |
| **Cluster 25 (Turbines T57, T58, T59, T60 and T67)** | | | | | | | | | | | | | | |
| SVC118-S132 | S132 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 2-3 | 3-4 | Gravel | Intermittent | S-RPW | A | Unnamed tributary to Silver Creek | SVC118 | 86.74 | S-RPW flowing southeast though uplands forest (Wetland W132 is approximately 100 feet upstream of proposed road crossing. (P1701, P1702, P1703, P1704) Drain D130 (P1698) and stream S132 meet approximately 20' upstream of road crossing and point where SD132 was recorded. Channel at road crossing is 3-5' in width. Stream S132 flows south from road crossing into W576 (P1695) and S576 appoximately 60 feet down gradient. | E-7 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC118-S576 | S576 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 2-6 | 2-8 | Gravel, Sand | Perennial | P-RPW | A | Unnamed tributary to Silver Creek | SVC118 | 86.74 | Stream S576 flows across corridor loosely west to east. Banks steep in some places but very flat in others. Riparian wetland W576 corridor is small to moderate in size. Water is clear. (P857, P858) | E-7 |
| SVC204-S577 | S577 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 2-15 | 4-16 | Gravel, Silt, Clay | Perennial | P-RPW | A | Unnamed tributary to Silver Creek | SVC204 | 88.65 | Stream is surrounded by a sugar maple forest to the N, E and W, about 75 feet to the south vegetation changes to shrub scrub on the edge of an agricultural field. Surrounding stream banks have sugar maple saplings. Diversity and wildlife value are both low. Stream splits into two tributaries (both with flow present) which have multiple drains. Tributaries come back together 100 feet from the split. | E-2 and E-7 |
| SVC76-S583 | S583 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 4-5 | 5-6 | Gravel, Sand, Silt/Clay | Intermittent | S-RPW | A | Unnamed tributary to Silver Creek | SVC76 | 75.71 | Stream meanders through hemlock and sugar maple forest. Many fallen trees and branches in stream with lots of leaves and small sticks caught on them. Banks have leafy debris but little understory/herbaceous growth. Some small drains leading to stream. Running water is clear. (P893, P894) | E-6 |
| SVC124-S591 | S591 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 1-4 | 1-5 | Gravel, Silt/Clay, Vegetation | Intermittent | S-RPW | A | Unnamed tributary to Silver Creek | SVC124 | 87.49 | Stream S591 meanders through cow pasture and fruit trees to west. Stream has low habitat value. Bottom vegetated in most areas, except where crosses centerline. (P883, P884) | E-4, E-12 and E-13 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC124-S592 | S592 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 3-6 | 7-9 | Silt/Clay | Perennial | P-RPW | A | Unnamed tributary to Silver Creek | SVC124 | 87.49 | Stream S592 flows from culvert under Hurlburt Road outside of survey corridor northeast though wetland W593. It then passes through a culvert under an active farm road and flows east through wetland W592. Stream is in active pastures in a gently rolling terrain. Bed is muddy within survey corridor, with some small gravel in W592. (P922) | E-2 |
| SVC124-S592A | S592a | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-3 | 0.5-1 | 2-8 | Gravel/Silt/Clay | Intermittent | S-RPW | A | Unnamed tributary to Silver Creek | SVC124 | 87.49 | Stream S592A flows east through wetland W593A before joining and providing inflow to S592. It occurs in an active cow pasture. | E-2 |
| SVC122-S594 | S594 | Sector E/Cluster 25 (Turbines T57, T58, T59, T60 and T67) | 0-6 | 1-2 | 4-5 | Gravle, Silt/Clay, Cobble | Intermittent | S-RPW | A | Unnamed tributary to Silver Creek | SVC122 | 42.31 | Stream S594 flowing from culvert under Hurlburt Road northeast to wetland W594. Two to three feet of scouring in south end near culvert along sloping terrain. Becomes less gravelly and no scour apparent in field near W594. Flows through active pasture into a wetland to the east of survey corridor. (P926, P927) | E-2 |
| **Cluster 26 (Turbines T64, T65 and T66)** | | | | | | | | | | | | | | |
| SVC104-S1526 | S1526 | Sector E/Cluster 26 (Turbines T64, T65 and T66) | 0-3 | 1-3 | 4-10 | Gravel, Silt/Clay, large Cobble | Intermittent | S-RPW | A | Unnamed tributary to Silver Creek | SVC104 | 24.69 | Stream S1526 is an intermittent, small rain water/snow melt runoff stream. Steep terrain with much erosion on both banks. Cows have access and have many crossings. Cow wastes in stream channel. (P815, P816) | E-9 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC109-S568 | S568 | Sector E/Cluster 26 (Turbines T64, T65 and T66) | 0-3 | 2-5 | 8-10 | Silt/Clay | Perrenial | P-RPW | A | Unnamed tributary to Silver Creek | SVC109 | 25.45 | Small perennial stream associated with wetland W568. Only minor flow, but drains moderate sized wetland so some flow should be present all year. Active pastureland to northeast and southwest. Cows cross streams. Changes to drain D568 short distance away. Across barbed wire fence, wide and fully vegetated. (P829) | E-8 |
| **Cluster 27 (Turbines T61 and T62)** | | | | | | | | | | | | | | |
| SVC106-S543 | S543 | Sector E/Cluster 27 (Turbines T61 and T62) | 3-6 | 1-3 | 2-10 | Gravel, Silt./Clay, Vegetation | Ephemeral | Non-RPW | A | Unnamed tributary to Silver Creek | SVC106 | 31.76 | Stream S543 enters survey corridor on west side as outflow from manmade pond (pond is outside corridor). It flows north through Wetland W544, then parallel to driveway and into western segment of wetland W543. It passes under driveway through culvert into the east segment of wetland W543, and continues as a drain through that segment. Becomes stream-like again briefly out of corridor to east, then less channelized. Probably becomes more channelized further out of corridor, as it is located near a NYS DEC mapped stream. (P729) | E-13 |
| SVC103-S1519 | S1519 | Sector E/Cluster 27 (Turbines T61 and T62) | 0-3 | 4-6 | 6-8 | Gravel, Silt/Clay | Perrenial | P-RPW | A | Unnamed tributary to Silver Creek | SVC103 | 46.55 | Rocky stream, flows through culvert under road. Banks have all upland vegetation. Stream is south of about 15 honey bee boxes. Vegetation is burdock, Rubus species, honeysuckle, and sugar maple. More bee boxes are on the south side of the stream, approximately 30 total. (P723, P724, P725, P726) | E-10 |

**Table 7 Stream Characteristics, Ball Hill Windpark Generation Portion**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVC73-S1520 | S1520 | Sector E/Cluster 27 (Turbines T61 and T62) | 0-3 | 7-12 | 7-12 | Gravel | Perrenial | P-RPW | A | Unnamed tributary to Silver Creek | SVC73 | 98.54 | Stream S1520 is a perennial stream with, high wildlife value, many tracks in riparian zone. Some large rocks in gravel (> 6" diameter). Many areas with runs and riffles. Collects runoff from the south via drain D1520. (P747, P748) | E-12 |
| **Sector E Collection Line** | | | | | | | | | | | | | | |
| SVC204-S577-See Cluster 25 | | | | | | | | | | | | | | |
| SVC126-S561 | S561 | Sector E Collection Line | 0-3 | 1-3 | 6-9 | Silt/Clay, muddy bottom | Perrenial | P-RPW | A | Unnamed tributary to Silver Creek | SVC126 | 87.07 | Stream S561 is a Minor stream flowing north out of a compacted, muddy cow pasture, through wetland W561 (vegetated pasture). Stream meanders through gently sloping terrain with a large riparian zone on both banks. (P763, P794, P795, P796) | E-1 |
| SVC122-S564 | S564 | Sector E Collection Line | 0-3 | 1-3 | 4-6 | Silt/Clay, rounded rocks | Ephemeral | Non-RPW | A | Unnamed tributary to Silver Creek | SVC122 | 42.31 | Stream S564 is a NYSDEC mapped stream whose channel may have been manipulated into agricultural drainage. Channel is wide and vegetated in west portion of corridor and without flow. It is mapped as wetland in that area. Flow becomes evident at eastern edge of wetland W564, and continues east to stream S561 out of corridor. (P799, P801) | E-1 |

Notes:

1 Stream flow classifications are based on the following definitions:

Perennial Relatively Permanent Water (P-RPW) - The stream flow is evident throughout the year, in most years.

Seasonal Relatively Permanent Water (S-RPW) - The stream channel contains flowing water for at least three months but does not flow throughout the year, in most years.

Non-RPW - The stream channel contains flowing water for less than three months of the year, in most years.

2 These stream classifications were inferred from NYCRR Chapter X.

**Table 8 Stream Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Streams Identified During Surveys Within the Project Area** | | | | | | | | | | | | | | |
| **Sector F Transmission Line** | | | | | | | | | | | | | | |
| WNC30-S50 | S50 | Sector F Transmission Line | 6+ | 12-16 | 25 | Bedrock | Perennial | P-RPW | C | Unnamed tributary to Walnut Creek | WNC30 | 118.43 | Stream S50 is large perennial RPW with quick, steady flow. Predominantly upland vegetation with 60 foot banks on each side. Stream flows in a northwest direction. (P266, P267) | F-9 |
| WNC103-S54 | S54 | Sector F Transmission Line | 6+ | 2 | 5-7 | Gravel, Sand, Silt/Clay | Perennial | P-RPW | C(T)[2] | Unnamed tributary to Walnut Creek | WNC103 | 78.40 | Stream S54 is a small, well incised, narrow stream with steep banks. Starts from culvert at unmapped pond outside the survey corridor and flows northwest into wetland W54 about 50 feet west of stream S54a. (P299, P300) | F-11 and F-12 |
| WNC103-S54a | S54a | Sector F Transmission Line | 6+ | 2 | 2-4 | Silt/Clay | Intermittent | S-RPW | C(T)[2] | Unnamed tributary to Walnut Creek | WNC103 | 78.40 | Unable to determine stream origin due to historic filling of channel with concrete debris (see photos P301 & P302). Additional household litter in stream channel from stream points S54a-1 to S54a-2. Staining not apparent at Transmission Line crossing at Stream Data Point SD54a. Stream S54a meets stream S54 at beginning of wetland W54 (main hydraulic input). (P301, P302, P303, P323, P324) | F-11 |
| WNC103-S56 | S56 | Sector F Transmission Line | 0-3 | 3 | 5 | Silt/Clay | Perennial | P-RPW | C(T)[2] | Unnamed tributary to Walnut Creek | WNC103 | 78.40 | Stream S56 flows west from roadside ditch east of Dennison Road, through culvert and becomes channelized. Mapped as stream S56 from culvert outflow continuing west beyond survey corridor after merging with stream S56a near the transmission line crossing. (P372) | F-12 |

**Table 8 Stream Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNC103-S56a | S56a | Sector F Transmission Line | 3-6 | 20 | 25 | Silt/Clay | Perennial | P-RPW | C(T)[2] | Unnamed tributary to Walnut Creek | WNC103 | 78.40 | Chanel blows out to pond-like feature (20 feet x 40 feet). Data point taken at southeast portion of ponded area. Flows southwest to stream S56 near transmission line crossing and then to an unnamed tributary to Walnut Creek. (P370, P371) | F-12 |
| SVC23-S60 | S60 | Sector F Transmission Line | 0-3 | 6 | 8-10 | Silt/Clay | Perennial | P-RPW | C(T)[2] | Unnamed tributary to Silver Creek | SVC23 | 101.13 | Stream S60 is between former agricultural field and forested area. Flow comes from drainage of wetland W60. Outflow is to an unnamed tributary to Silver Creek. (P352, P353) | F-13 |
| WNC47-S103 | S103 | Sector F Transmission Line | 3-6+ | 10 | 25 | Bedrock | Perennial | P-RPW | C | Unnamed tributary to Walnut Creek | WNC47 | 28.80 | Stream S103 is a large perennial stream, flows northwest with no live vegetation. Drain D1032 run into stream. (P563, P564) | F-7 |
| TUC6-S108 | S108 | Sector F Transmission Line | 0-3 | 1-2 | 1-2 | Silt/Clay | Perennial | P-RPW | C | Unnamed tributary to Tupper Creek | TUC6 | 35.15 | Stream S108 is perennial stream, with moderate to high value, dominated by Typha latifolia, other species include sensitive fern and Viola spp. (P1586) | F-1 |
| WNC87-S607 | S607 | Sector F Transmission Line | 0-3 | 2 | 2 | Silt/Clay | Perennial | P-RPW | C[2] | Unnamed tributary to Walnut Creek | WNC87 and WNC92 | 31.98 and 51.72 | Stream S607 is a very small creek, flowing north, associated with wetland W607, located on the western section of wetland. Flow transects survey corridor. (P1006, P1007) | F-3 |
| WNC92-S607a | S607a | Sector F Transmission Line | 0-3 | 2 | 4-6 | Gravel | Perennial | P-RPW | C[2] | Unnamed tributary to Walnut Creek | WNC92 | 51.72 | Stream S607a is a minor stream flowing north though wetland W607 on the eastern section of the wetland. (P1008, P1009) | F-3 |
| WNC28-S1014 | S1014 | Sector F Transmission Line | 0-3 | 3 | 6 | Bedrock | Perennial | P-RPW | C(T) | Unnamed tributary to Walnut Creek | WNC28 | 62.03 | Stream S1014 is a P-RPW stream, which flows northwest. Stream crosses transmission line. (P279, P281, P282, P283) | F-10 |

**Table 8 Stream Characteristics, Ball Hill Windpark Transmission Section 1**

| Application ID | Field ID | Sector/ Cluster | Bank Height (feet) | Width of Water (feet) | Bank to Bank Width (feet) | Substrate | Flow Type | Flow Type[1] | NYSDEC Classification | Connection | Watershed | Stream Reach Drainage Area (Acres) | Comments | Appendix J Wetland Map Sheet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNC28-S1014a | S1014a | Sector F Transmission Line | 0-3 | 1 | 4 | Gravel | Intermittent | S-RPW | C(T) | Unnamed tributary to Walnut Creek | WNC28 | 62.03 | Small branch splitting from stream S1014 near stream point S1014-2 resulting high flow event. Reverts to groundwater at stream point S1014a-6. (P280, P284, P285) | F-10 |
| WNC47-S2000 | S2000 | Sector F Transmission Line | 3-6 | 2 | 5 | Gravel | Intermittent | S-RPW | C | Unnamed tributary to Walnut Creek | WNC47 | 28.80 | Stream S2000 is an intermittent stream, which flows north. | F-7 |

1 Stream flow classifications are based on the following definitions:
Perennial Relatively Permanent Water (P-RPW) - The stream flow is evident throughout the year, in most years.
Seasonal Relatively Permanent Water (S-RPW) - The stream channel contains flowing water for at least three months but does not flow throughout the year, in most years.
Non-RPW - The stream channel contains flowing water for less than three months of the year, in most years.
2 These stream classifications were inferred from NYCRR Chapter X.

# 6 References


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# A Sector A

Sector A

Cluster 1

Wetland Datasheets
W78, W79, W80, W81, W82, W83, W84, W85, W86, W87, W88

Stream Datasheets

S81, S83, S86

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC29-W78<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 15 | | | | |
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Carex vulpinoidea* | H | OBL | 30 | | | | |
| *Cornus amomum* | S | FACW | 20 | | | | |
| *Solidago rugosa* | H | FAC | 15 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/2 | 7.5YR 5/6 | 3%, small, faint | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field and Mapping Review

Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
Approximately 1000 feet

What watershed is the delineated wetland within?
West Branch Conewango Creek 29

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PEM/PSS wetland with moderate vegetative diversity, associated a drainage swale between two agricultural fields in the hedgerow of an east sloping hillside. Receives surface water runoff from up-gradient adjacent agricultural fields and drains east to the roadside ditch. Ultimately to an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge and discharge, and toxicant filtration function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC29-W79<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Carex species* | H | ≥FAC | 15 | | | | |
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Solidago rugosa* | H | FAC | 15 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Fragiaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/2 | 2.5YR 4/8 | 10%, small, distinct | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Mapping Review

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

Approximately 1100 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 29

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity, located in active agricultural field associated with farm machinery ruts. Receives surface water runoff from up-gradient areas and drains northeast via overland flow to wetland W78 which flows to an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge and discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC33-W80<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 10 | *Cornus stolonifera* | S | FACW+ | 5 |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Cornus amomum* | S | FACW | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Solidago canadensis* | H | FACU | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua silt loam**

Drainage Class: **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/1 | 2.5YR 5/8 | 10%, small, distinct | Very moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

S81, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

250 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 33

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PSS/PEM with moderate vegetative diversity on a west sloping hillside. Receives surface water runoff near wetland flag W80-1 (P453) and groundwater seep near wetland flag W80-12. Drains to the west to stream S81 via discrete overland flow from wetland flag W80-11, drain D80 (near wetland flag W80-4), and drain D80a.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC33-W81<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 34 | *Onoclea sensibilis* | H | FACW | 8 |
| *Cornus amomum* | S | FAC | 34 | | | | |
| *Impatiens capensis* | H | FACW | 8 | | | | |
| *Acer rubrum* (saplings) | H | FAC | 4 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 4 | | | | |
| *Toxicodendron radicans* | H | FAC | 4 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua silt loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 7.5YR 3/1 | 7.5YR 5/8 | 1%, small, distinct | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observations

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

Riparian

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 33

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW** ☒ **P-RPW**
- ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value riparian PEM wetland in a forested area with moderate vegetative diversity, associated with stream S81. Receives inflow and outflow via stream S81, an unnamed tributary to West Branch Conewango Creek. Moderate wildlife habitat and groundwater discharge and recharge function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS/PFO<br>Transect ID: WBC33-W82<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Cornus amomum* | S | FAC | 30 | | | | |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Phalaris arundinacea* | H | FACW | 30 | | | | |
| *Solidago* sp. | H | ≥FAC | 15 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 15 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 1 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam** Drainage Class: **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 7.5YR 3/1 | 7.5YR 5/6 | 1%, small, distinct | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observations, _____

Stream name (if known):

_S81, Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

100 feet

What watershed is the delineated wetland within?

West Branch Conewango Creek 33

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PSS/PFO wetland, with moderate vegetative diversity, located on southwest sloping hillside. Receives surface water runoff from up-gradient areas, drains D82 and D82a, and from wetland W80 via drains D80, D80a, and D80b. Abuts to stream S81 where drain D82 enters the stream (between points W82-3 and D82-3. Moderate wildlife habitat and groundwater discharge and recharge function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC28-W83<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 24 | | | | |
| *Onoclea sensibilis* | H | FACW | 24 | | | | |
| *Cornus amomum* | S | FAC | 21 | | | | |
| *Cornus stolonifera* | S | FACW+ | 18 | | | | |
| *Salix discolor* | S | FACW | 9 | | | | |
| *Symplocarpus foetidus* | H | OBL | 3 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 10 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua silt loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | 5YR 3/4 | 5%, small, faint | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S83, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

Headwaters, abutting

What watershed is the delineated wetland within?

West Branch Conewango Creek 28

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderately size and value PEM/PSS, with moderate vegetative diversity associated with stream S83. Up-gradient of wetland flag W83-16 primarily PSS while down-gradient side primarily PEM. Water drains down-gradient to the southwest. Stream and wetland continue beyond the survey corridor to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WBC131-W84<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 45 | *Acer rubrum* | T | FAC | 7 |
| *Carex crinita* | H | OBL | 23 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 7 | | | | |
| *Equisetum arvense* | H | FAC | 4 | | | | |
| *Fagus grandifolia* | T | FACU | 4 | | | | |
| *Onoclea sensibilis* | H | FACW | 7 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ **(only in historic logging ruts)** | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua silt loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 7.5YR 2.5/1 | - | - | Moist silt loam |
| 4-12 | B | 2.5YR 6/1 | 10YR 5/6<br>10YR 3/1 | 40%, large, faint<br>30%, large, distinct | Silt loam with small amounts of fine gravel |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Topographic map review

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

350 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 131

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and wildlife habitat value PFO wetland with moderate vegetative diversity. Associated with inundated logging roads in upland forest on slightly northwest sloping hillside. Based on landscape position it is assumed to drain to the northwest to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC33-W85<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Carex* sp. | H | FACW | 15 | | | | |
| *Solidago rugosa* | H | FAC- | 15 | | | | |
| *Ranunculus repens* | H | FAC | 15 | | | | |
| *Fragaria virginiana* | H | FACU | 15 | | | | |
| *Poa* sp. | H | FACU | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua silt loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10 | A | 10YR 2/2 | 10YR 6/8 | 3%, small, distinct | Saturated silt loam | |
| 10-14+ | B | 10YR 4/2 | 7.5YR 6/8 | 5%, small, distinct | Moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S81, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

100 yards

What watershed is the delineated wetland within?

West Branch Conewango Creek 33

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM, with little vegetative diversity, located in a maintained field. Receives surface water (up-gradient) and water from small groundwater seeps. Drains west into drain D85 beyond wetland boundary and reverts to overland flow to stream S81. Some groundwater recharge/discharge functions and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC46-W86<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 27% | | | | |
| *Equisetum arvense* | H | FAC | 9% | | | | |
| *Carex sp.* | H | >FAC | 9% | | | | |
| *Typha latifolia* | H | OBL | 18% | | | | |
| *Caltha palustris* | H | OBL | 9% | | | | |
| *Impatiens capensis* | H | FACW | 27% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14+ | A | 10YR 2/1 | 7.5YR 4/8 | 3%, small, distinct | Silty clay loam with 40% PDOM | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Observations_

Stream name (if known):

_S86, Unnamed tributary to West Branch Conewango Creek_

Approximate distance to stream:

_0 feet_

What watershed is the delineated wetland within?

_West Branch Conewango Creek 46_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value riparian wetland, with moderate vegetative diversity, associated with S86. Moderate wildlife habitat, and groundwater recharge/discharge. Continues west beyond survey corridor to unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? See comments ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC46-W87<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Cornus stolinifera* | S | FACW | 80% | | | | |
| *Equisetum arvense* | H | FAC | 10% | | | | |
| *Solidago rugosa* | H | FAC | 10% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☐ |
| Depth of inundation: 4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: at surface inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/1 | n/a | n/a | Saturated silt loam |
| 4-10 | B | 10YR 6/2 | 10YR 7/8 | 5%, small, faint | Slightly moist clay |
| 10-14 | B | 2.5YR 3/3 | n/a | n/a | Slightly moist clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation of up-gradient water source

Stream name (if known):

S86, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

200 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 46

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PSS with little vegetative diversity; associated depression adjacent to gas well, probable remains of drilling pond for well. Receives surface water runoff via drain D87-1a to -1b . Drains south to stream S86 via D87. Low groundwater recharge/discharge due to high clay soil.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? See comments ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC33-W88<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 90% | | | | |
| *Carex vulpinoidea* | H | OBL | 5% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: at surface inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

## SOILS

Map Unit Name (Series and Phase) : **Chautauqua silt loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/1 | n/a | n/a | Saturated silt loam |
| 4-14 | B | 10YR 3/1 | 2.5YR 4/4 | 5%, small, distinct | Moist silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions Few Mg
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field Observation_____

Stream name (if known):

_S81, Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

750 feet_____ __

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Conewango Creek 33_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _Inundated_____

**Rationale/Remarks:**

**Mapped portion is the west edge of a small, moderate value, PEM wetland with little vegetative diversity, associated with a linear natural depression in a maintained field. Moderate groundwater recharge/discharge function and value. Drains west via discrete overland flow during high water events to stream S81 (P493, P494).**

**FEATURE ID : WBC33-S81**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 05-16-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _See photo P463_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _West Branch Conewango Creek 33_____

Stream Flow Direction _Northeast_____

Width (ft) (water's edge to water's edge) _2 feet_____

Width (ft) (bank to bank) _5 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg. matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC33-S81**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Glyceria striata,* and *Cornus amomum* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 15-20 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 10 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _Northeast_____ | | | | If yes, list: Unknown, |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W81 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Unknown snail species |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Small P-RPW flowing west between fallow agricultural field and upland forest. Riparian wetland W81 is mapped within the banks. Flows to an unnamed tributary to West Branch Conewango Creek.**

**FEATURE ID : WBC28-S83**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 05-16-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _See photo P463_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _West Branch Conewango Creek 28_____

Stream Flow Direction _South_____

Width (ft) (water's edge to water's edge) _3 feet_____

Width (ft) (bank to bank) _12-15 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg. matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : WBC28-S83**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: *Carex vulpinoidea, Glyceria striata,* and *Onoclea sensibilis* |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 5 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 5 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _South_____ | | | | If yes, list: Unknown, |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W83 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Water strider |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Unknown snail species |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _Yes_____ | | | | Comments: |
| Description of Erosion: _Minor bank scour_____ | | | | |

Comments:

**Stream starts from wetland W83 where wetland narrows and becomes more channelized. It continues to the southwest beyond the survey corridor to an unnamed tributary to West Branch Conewango Creek.**

**FEATURE ID : WBC46-S86**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5-19-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___WBC46____

Stream Flow Direction _____West_____

Width (ft) (water's edge to water's edge) ___3'_____

Width (ft) (bank to bank) _30'-40'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC46-S86**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Onoclea sensibilis*, *Typha latifolia*, *Carex* sp., *Equisetum* sp., *Caltha palustris* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | |
| | | | | Approximate Riparian Width (facing d.s.) 0-2 ft left bank<br>20-30 ft right bank |
| *Direction when facing downstream: ___West___ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W86 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Water strider |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? __No_____ | | | | If yes, list: |
| Evidence of Erosion? __No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Small channelized stream through upland forest blows out into riparian wetland (stream flows west).**

Sector A

Cluster 2

Wetland Datasheets

W91

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC46-W91<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 36% | *Cornus amomum* | S | FACW | 9% |
| *Carex sp.* | H | FACW | 18% | | | | |
| *Salix discolor* | S | FACW | 9% | | | | |
| *Salix fragilis* | S | FAC+ | 9% | | | | |
| *Viburnum recognitum* | S | FACW- | 9% | | | | |
| *Cornus stolonifera* | S | FACW+ | 9% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 6-8 inches<br>Most places | Oxidized Root (live roots)<br>Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: at surface<br>inches | FAC Neutral: ☒ | Water-stained Leaves:<br>☒ |
| Depth to saturated soil: 0-6 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10YR 3/1 | n/a | n/a | Saturated silt loam |
| 6-14 | B | 10YR5/1 | 7.5YR 6/8 | 30%, large, distinct | Moist clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field Observation

Stream name (if known):
S81, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
240 meters

What watershed is the delineated wetland within?
West Branch Conewango Creek 46

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, high value inundated PSS wetland, with moderate vegetative diversity, located adjacent to reverting field. Receives surface water run-off from up-gradient areas (very wet 6-8 inches of inundation from only surface water inflow). Drains north via drain or discrete overland flow to unnamed tributary to West Branch Conewango Creek beyond corridor. High groundwater recharge/discharge and wildlife habitat function and values.**

Sector A

Cluster 3

Wetland Datasheets

W74, W75, W76

Stream Datasheets

S75

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS/PFO<br>Transect ID: WBC77-W74<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 16 | *Acer rubrum* | T | FAC | 5 |
| *Fraxinus pennsylvanica* | T | FACW | 8 | *Typha latifolia* | H | OBL | 5 |
| *Cornus species.* | S | ≥FAC | 2 | *Viburnum recognitum* | S | FACW- | 11 |
| *Salix discolor* | S | FACW | 11 | | | | |
| *Impatiens capensis* | H | FACW | 27 | | | | |
| *Phalaris arundinacea* | H | FACW | 11 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/1 | 2.5Y 5/1 | 1%, small, faint | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field Observation _____

Stream name (if known):
_S75, Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:
145 meters

What watershed is the delineated wetland within?
West Branch Conewango Creek 77

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, moderate to high value PSS wetland with high vegetative value, located within forested area including a PEM component. Also contains ruts from farm equipment within the area between the PSS/PFO and PEM portion of the wetland. Located on top of an inundated west sloping hillside within an active cow pasture. Moderate wildlife habitat and high groundwater recharge and discharge function and value. Drains to the west to the PEM portion via overland sheet flow and then on to the southwest to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC77-W75<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Geranium maculatum* | H | FACU | 20 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Solidago canadensis* | H | FACU | 15 | | | | |
| *Equisetum arvense* | H | FAC | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 60%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chadakoin silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/1 | 2.5Y 4/8 | 3%, small, distinct | Saturated silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Flow observation,

Stream name (if known):

_S75, Unnamed tributary to West Branch Conewango Creek___

Approximate distance to stream:

_Riparian_____

What watershed is the delineated wetland within?

West Branch Conewango Creek 77_____

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value riparian PEM wetland with low vegetative diversity, located within the banks of stream S75. Also receives inflow via groundwater seep between wetland flags W75-1 and W75-5. Outflow via S75, an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge and discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC77-W76<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 20 | | | | |
| *Phalaris arundinacea* | H | FACW | 40 | | | | |
| *Carex sp.* | H | ≥FAC | 40 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chadakoin silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 2.5YR 4/2 | 10YR 5/8 | 3%, small, faint | Saturated silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Flow observation

Stream name (if known):

S75, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

150 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 77

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☐ **discrete and confined**
- ☒ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity, associated with a drainage swale that drains north into stream S75. Receives surface water runoff from the east. Low groundwater recharge and discharge, or amphibian habitat function and values.**

**FEATURE ID : WBC77-S75**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 05-15-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _Divide between former field and forest_____

Tributary is: Natural ☐ Manipulated ☒

Watershed: _West Branch Conewango Creek 77_____

Stream Flow Direction _Southeast_____

Width (ft) (water's edge to water's edge) _2 feet_____

Width (ft) (bank to bank) _3 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg. matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC77-S75**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | n/a ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _North_____ | | | | If yes, list: Unknown, |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W75 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Unknown snail species |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Stream starts as drain D75 flowing southwest from and up-gradient agricultural field. Apparent dumping of fieldstones where drain transitions into a stream.**

Sector A

Collection Line

Wetland Datasheets
W77, W89, W90

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC72-W77<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 30 | | | | |
| *Salix discolor* | S | FACW | 50 | | | | |
| *Cornus stolonifera* | S | FACW+ | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/2 | 7.5YR 5/8 | 2%, small, distinct | Very moist silt loam |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation and Desktop review

Stream name (if known):
Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
1600 feet

What watershed is the delineated wetland within?
West Branch Conewango Creek 72

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value, linear PSS associated a drainage swale between an agricultural field and a residence. Receives surface water runoff from up-gradient areas and drains east to the roadside ditch, ultimately drains to an unnamed tributary to West Branch Conewango Creek. Low wildlife habitat function and values, with some toxicant filtration function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC38-W89<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20% | | | | |
| *Equisetum arvense* | H | FAC | 10% | | | | |
| *Typha latifolia* | H | OBL | 5% | | | | |
| *Cornus stolonifera* | S | FACW | 15% | | | | |
| *Salix discolor* | S | FACW+ | 15% | | | | |
| *Vibernum recognitum* | S | FACW- | 25% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 2/1 | n/a | n/a | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
Desktop review

Stream name (if known):
Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
550 feet

What watershed is the delineated wetland within?
West Branch Conewango Creek 38

Comments:

Flow relationship to associated stream:
☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:
☐ **discrete** ☒ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PEM/PSS wetland with moderate vegetative diversity; located on a northeast sloping hillside. Receives up-gradient surface water run-off and water via drain D89. Drains to roadside ditch and then to unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge/discharge and wildlife habitat functions and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC46-W90<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 90% | | | | |
| *Onoclea sensibilis* | H | FACW | 5% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒<br>Multiple drains |
| Depth of inundation: at surface<br>(from ditch runoff) inches | Oxidized Root (live roots)<br>Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: at surface<br>inches<br>Depth to saturated soil: at surface<br>inches | FAC Neutral: ☒ | Water-stained Leaves:<br>☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

## SOILS

Map Unit Name (Series and Phase) : **Erie silt loam**

Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 2/2 | 2.5YR 5/8 | 1%, medium, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions Few Fe
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Topographic map review

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

900 feet

What watershed is the delineated wetland within?

West Branch Conewango Creek 46

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: Inundated

**Rationale/Remarks:**

**Moderate size and value PEM wetland with moderate vegetative value, located on slight northwest sloping hill. Receives water via drain D90 from road culvert outflow which widens into multiple small drainage channels down gradient from the culvert. Drains northwest beyond survey corridor to unnamed tributary to West Branch Conewango Creek. Moderate wildlife habitat and groundwater recharge/discharge functions and values.**

# Sector A

## Cluster 1

### Wetland Photos

W78, W79, W80, W81, W82, W83, W84, W85, W86, W87, W88

### Drain Photos

D1018, D80b and D87

### Stream Photos

S81, S83 and S86

### Turbine Location Photos

T1, T2 and T3



Date: May 15, 2008
Location P446: Wetland W78 from W78-1
Direction of View: West



Date: May 15, 2008
Location P447: Wetland W78 and road ditch from W78-1
Direction of View: North



Date: May 15, 2008
Location P448: Wetland W79 from approximately 30 feet southwest of W79-1
Direction of View: Northeast



Date: May 15, 2008
Location P449: T2
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 15, 2008
Location P450: T2
Direction of View: West



Date: May 15, 2008
Location P451: T2
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 15, 2008
Location P452: T2
Direction of View: East



Date: May 19, 2008
Location P481: Wetland W85 from east of W85-1
Direction of View: West



Date: May 19, 2008
Location P493: Wetland W88 (open) draining west to Stream S81 from east of W88-2
Direction of View: East



Date: May 19, 2008
Location P494: Wetland W88 (open) draining west to Stream S81 from east of W88-2
Direction of View: West



Date: May 19, 2008
Location P485: Stream S86 (upstream) from north of W86-16
Direction of View: East



Date: May 19, 2008
Location P486: Stream S86 (downstream) from north of W86-16
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 19, 2008
Location P484: Wetland W86 (down gradient) from southwest of W86-8
Direction of View: West



Date: May 19, 2008
Location P483: Wetland W86 (up-gradient) from southwest of W86-8
Direction of View: East



Date: May 19, 2008
Location P487: Drain D87 from northwest of Wetland W87-3
Direction of View: South



Date: May 19, 2008
Location P488: Wetland W87 and Drain D87 inflow
Direction of View:

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 19, 2008
Location P482: Drain D1019 near D1019-2
Direction of View: West



Date: May 19, 2008
Location P489: T3
Direction of View: North



Date: May 19, 2008
Location P490: T3
Direction of View: West



Date: May 19, 2008
Location P491: T3
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 19, 2008
Location P492: T3
Direction of View: East



Date: May 16, 2008
Location P453: Wetland W80 (up-gradient) from W80-1
Direction of View: Southeast



Date: May 16, 2008
Location P454: Wetland W80 (down gradient) from W80-3
Direction of View: West



Date: May 16, 2008
Location P455: Wetland W81 and Stream S81 (downstream) at SD81
Direction of View: West



Date: May 16, 2008
Location P456: Wetland W81 and Stream S81 (upstream) from SD81
Direction of View: East



Date: May 16, 2008
Location P457: South end of Wetland W82 and Drain D80b from W82-1
Direction of View: East



Date: May 16, 2008
Location P458: Wetland W82 going to Stream S81 from east of W82-2
Direction of View: West



Date: May 16, 2008
Location P460: Wetland W82 from southeast of W82-13
Direction of View: Northeast



Date: May 16, 2008
Location P461: Wetland W82 where Drain D82 goes into Stream S81
Direction of View: South



Date: May 16, 2008
Location P462: West edge of Wetland W82 from south of W82-8
Direction of View: Northeast



Date: May 16, 2008
Location P463: Stream S83 (downstream) from SD83
Direction of View: South



Date: May 16, 2008
Location P464: Stream S83 (upstream) from SD83

Direction of View: South



Date: May 16, 2008
Location P478: Stream S83 from S83-1 (upstream)
Direction of View: Northeast



Date: May 16, 2008
Location P479: Stream S83 (downstream) from S83-1
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 16, 2008
Location P480: Stream S83 and Wetland W83 from W83-14
Direction of View: Southwest



Date: May 16, 2008
Location P476: Wetland W83 continuing beyond W83-1open
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 16, 2008
Location P477: Wetland W83 from W83-1open
Direction of View: West



Date: May 16, 2008
Location P469: Drain D1018 on north edge of field
Direction of View: WEst

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 16, 2008
Location P470: Drain D1018 on east edge of field
Direction of View: South



Date: May 16, 2008
Location P472: Wetland W84 from east of W84-9
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 16, 2008
Location P473: Wetland W84 from east of W84-9
Direction of View: North



Date: May 16, 2008
Location P474: Inundated logging road from northeast of Wetland W84-10
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 16, 2008
Location P475: Wetland W84 from northeast of W84-10
Direction of View: North



Date: May 16, 2008
Location P465: T1
Direction of View: North



Date: May 16, 2008
Location P466: T1
Direction of View: West



Date: May 16, 2008
Location P467: T1

Direction of View: South



Date: May 16, 2008
Location P468: T1
Direction of View: East

# Sector A

**Cluster 2**

**Wetland Photos**

W91

**Drain Photos**

D90

**Stream Photos**

NA

**Turbine Location Photos**

**T4**

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 19, 2008
Location P1500: Wetland W91 from WD91
Direction of View: Northeast



Date: May 19, 2008
Location P1501: Wetland W91 where wetland reverts to drain/overland flow
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 19, 2008
Location P1502: Wetland W91 from W91-2
Direction of View: Southwest



Date: May 19, 2008
Location P1503: Wetland W91 inflow from W91-2
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 19, 2008
Location P1505: T4
Direction of View: North



Date: May 19, 2008
Location P1506: T4
Direction of View: West



Date: May 19, 2008
Location P1507: T4
Direction of View: South



Date: May 19, 2008
Location P1508: T4
Direction of View: East

# Sector A

## Cluster 3

### Wetland Photos

W74, W75, W76

### Drain Photos

D75 and D76

### Stream Photos

S75

### Turbine Location Photos

T5, T6

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 15, 2008
Location P420: PEM portion of Wetland W74, machinery ruts, from north of W74-108
Direction of View: East



Date: May 15, 2008
Location P421: Overland flow from Wetland W74-6
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 15, 2008
Location P445: East edge of Wetland W74 at road and ditch from southeast of W74-103
Direction of View: South



Date: May 15, 2008
Location P424: Rutted farm road draining west to PEM portion of Wetland W74 from W74-4
Direction of View: Northwest



Date: May 15, 2008
Location P425: T5
Direction of View: North



Date: May 15, 2008
Location P426: T5
Direction of View: West



Date: May 15, 2008
Location P427: T5
Direction of View: South



Date: May 15, 2008
Location P428: T5

Direction of View: East



Date: May 15, 2008
Location P422: Wetland W75 and inundated portion at WD75
Direction of View: East



Date: May 15, 2008
Location P423: Wetland W75 extending across rutted farm road, from WD74
Direction of View: Southwest



Date: May 15, 2008
Location P429: Start of Drain D75 as it turns into Stream S75
Direction of View: South



Date: May 15, 2008
Location P430: Start of Stream S75 from S75-1
Direction of View: North



Date: May 15, 2008
Location P431: Stream S75 from south of S1018-1
Direction of View: South



Date: May 15, 2008
Location P432: Wetland W75 and Stream S75 from north of W75-1
Direction of View: South



Date: May 15, 2008
Location P437: Drain D76, agricultural swale
Direction of View: South



Date: May 15, 2008
Location P438: Drain D76 and Wetland W76 (agricultural swale)
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 15, 2008
Location P439: Wetland W76 form W76-6
Direction of View: South



Date: May 15, 2008
Location P440: Drain D76 outflow from Wetland W76-6 to Stream S75
Direction of View: Northwest



Date: May 15, 2008
Location P441: Stream S75 (upstream) from SD75
Direction of View: Northwest



Date: May 15, 2008
Location P442: Stream S75 (downstream) from SD75
Direction of View: Southeast



Date: May 15, 2008
Location P433: T6
Direction of View: North



Date: May 15, 2008
Location P434: T6
Direction of View: West



Date: May 15, 2008
Location P435: T6
Direction of View: South



Date: May 15, 2008
Location P436: T6
Direction of View: East

:

# Sector A

**Collection Line**

**Wetland Photos**

W77, W89 and W90

(See Cluster 3 for W74)

**Drain Photos**

D89 and D90

**Stream Photos**

NA

**Turbine Location Photos**

NA



Date: May 15, 2008
Location P443: North edge (up-gradient) of Wetland W77 form WD77
Direction of View: West



Date: May 15, 2008

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008

Location P444: North edge of Wetland W77 draining to ditch from WD77
Direction of View: East



Date: May 19, 2008
Location P495: Drain D89 inflow to W89 from east of D89-1
Direction of View: East



Date: May 19, 2008

Location P496: Wetland W89 from W89-11
Direction of View: Northeast



Date: May 19, 2008
Location P497: Wetland W89-19 at roadside ditch draining north
Direction of View: Northwest



Date: May 19, 2008
Location P498: Wetland W90 from Drain D90-4

Direction of View: Southeast



Date: May 19, 2008
Location P499: Wetland W90 from Drain D90-4
Direction of View: Northwest

# B Sector B

Sector B

Cluster 4

Wetland Datasheets

W92

Stream Datasheets

S92

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC72-W92<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 17 | *Glyceria striata* | H | OBL | 8 |
| *Salix discolor* | S | FACW | 17 | *Juncus effusus* | H | FACW+ | 8 |
| *Typha latifolia* | H | OBL | 6 | *Cornus amomum* | S | FACW | 8 |
| *Solidago gigantea* | H | FACW | 13 | *Impatiens capensis* | H | FACW | 8 |
| *Cornus stolonifera* | S | FACW+ | 6 | | | | |
| *Carex sp.* | H | ≥FAC | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/2 | 10YR 4/4 | 3%, small, distinct | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Observed

Stream name (if known):
_S92, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
Riparian

What watershed is the delineated wetland within?
West Branch Conewango Creek 72

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, and value PSS wetland with some PEM riparian components, with moderate vegetative diversity; located on a north sloping hillside. Drains north into the channelized stream S92, and unnamed tributary to West Branch Conewango Creek.**

**FEATURE ID : WBC72-S92**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5-20-08

State: NY

Observers: D. Crawley, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _West Branch Conewango Creek 46_____

Stream Flow Direction _North_____

Width (ft) (water's edge to water's edge) _2 feet_____

Width (ft) (bank to bank) _3 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC72-S92**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Impatiens capensis, Onoclea sensibilis, Solidago sp., Typha latifolia,* and *Salix discolor.* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 40 ft left bank<br>10 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| *Direction when facing downstream: _North_____ | | | | |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W92 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Water strider |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? __No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Perennial stream associated with riparian wetland W92 along banks, down gradient from agricultural field.**

Sector B

Cluster 5

Wetland Datasheets

W93, W94, W95, W96, W97, W98, W99, W100

Stream Datasheets

S98

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC72-W93<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 15 | *Glyceria striata* | H | OBL | 15 |
| *Cornus amomum* | S | FACW | 23 | | | | |
| *Onoclea sensibilis* | H | FACW | 11 | | | | |
| *Carex* sp. | H | ≥FAC | 3 | | | | |
| *Cornus stolonifera* | S | FACW+ | 15 | | | | |
| *Viburnum recognitum* | S | FACW- | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Lots of standing water related to historic logging road ruts. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 2.5YR 4/2 | 2.5YR 5/6 | 3%, small, faint | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
Discussion with field crew and desktop review

Stream name (if known):
S92, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
540 meters

**Watershed Relationship**

What watershed is the delineated wetland within?
West Branch Conewango Creek 83

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:
Actually drains to West Branch Conewango Creek 72 stream reach.

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach:
- ☐ **TNW** ☒ **P-RPW**
- ☐ **S-RPW** ☐ **Non-RPW**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low to moderate value, PSS wetland with PEM component along logging road, with low to moderate vegetative diversity. Located on north down sloping topography. Drains to the north to drain D1020 along the southern edge of the woods. Inundated logging roads drain to agricultural ditch D1020 which then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast (now within the adjacent watershed of West Branch Conewango Creek 72 which is drained by delineated stream S92).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Ball Hill<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC72-W94<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Salix discolor* | S | FACW | 22 | | | | |
| *Viburnum recognitum* | S | FACW- | 25 | | | | |
| *Equisetum arvense* | H | FAC | 25 | | | | |
| *Onoclea sensibilis* | H | FACW | 25 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Remarks: 100% of the dominant species within wetland W94 are considered hydrophytic, therefore the criteria are met.**

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks: Above remarks should be rationale.

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒<br>**Water drains to north over upland area to agricultural ditch.** |
| Depth of inundation: 0-3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0-6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☒ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Area is depressional and seems to hold water for much of the year, therefore the criteria are met.

**SOILS**

Map Unit Name (Series and Phase) : **Langford Silt Loam**

Drainage Class **Well Drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Fragiochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/2 | 10YR 3/4 | few, small, faint | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Low chroma with mottles therefore soil is hydric.

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Desktop review

Stream name (if known):

S92, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

530 meters

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 83

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Actually drains to West Branch Conewango Creek 72 stream reach

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

***(WBC 72)**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value, inundated PSS depressional wetland, with low vegetative diversity. Appears to flow north via overland flow across upland areas when full to agricultural ditch D1020. D1020 then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast (now within the adjacent watershed of West Branch Conewango Creek 72 which is drained by delineated stream S92). Moderate to low wildlife habitat value and moderate water quality and groundwater discharge and recharge function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC72-W95<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Salix discolor* | S | FACW | 24 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Equisetum arvense* | H | FAC | 27 | | | | |
| *Viburnum recognitum* | S | FACW- | 20 | | | | |
| *Populus tremuloides* | T | FACU | 6 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

**Remarks:**

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks: Greater than 50% of the dominant species within wetland W95 are considered hydrophytic, therefore the criteria are met.

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒<br>**Linear wetland that drains north to agricultural ditch.** |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☒ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Linear wetland that drains north to agricultural ditch.

**SOILS**

Map Unit Name (Series and Phase) : **Langford Silt Loam**

Drainage Class **Well Drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Fragiochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/2 | 10YR 4/4 | few, fine, distinct | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Low chroma with mottles therefore soil is hydric.

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

***(WBC 72)**

What is this based on?

Observation

Stream name (if known):

S92, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

500 miles

What watershed is the delineated wetland within?

West Branch Conewango Creek 83

Comments:

Actually drains to West Branch Conewango Creek 72 stream reach

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value, linear PSS wetland, with low vegetative diversity. Receives water from a wet logging road from the south and drains into agricultural ditch D1020 to the north. Agricultural ditch D1020 then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast (now within the adjacent watershed of West Branch Conewango Creek 72 which is drained by delineated stream S92). Moderate to low wildlife habitat value. Moderate water quality and groundwater discharge and recharge function and values due to agricultural ditch.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC72-W96<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 44 | | | | |
| *Solidago rugosa* | H | FAC | 29 | | | | |
| *Carex sp.* | H | ≥FAC | 7 | | | | |
| *Salix discolor* | S | FACW | 7 | | | | |
| *Viburnum recognitum* | S | FACW- | 7 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 3 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Remarks:**

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class: **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 2.5Y 4/1 | 2.5Y 5/6 | 3%, small, distinct | Moist silt loam | |
| 4-16 | B | 10YR 5/6 | 2.5Y 5/2 | 205, large, distinct | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
Discussion with field crew and desktop review

Stream name (if known):
S92, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
570 meters

**Watershed Relationship**

What watershed is the delineated wetland within?
West Branch Conewango Creek 83

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:
Actually drains to West Branch Conewango Creek 72 stream reach

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size open PEM with low to moderate vegetative diversity and wildlife habitat value. Water from up-gradient logging road in southwest corner of the wetland drains north to drain D1020. Agricultural ditch D1020 then flows to the west to the roadside ditch along the eastern side of Round Top Road. Flow will continue northwest in the roadside ditch. It will then drain to the northeast (now within the adjacent watershed of West Branch Conewango Creek 72 which is drained by delineated stream S92).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC80-W97<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 35 | | | | |
| *Equisetum arvense* | H | FAC | 20 | | | | |
| *Glyceria striata* | H | OBL | 20 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Remarks:**

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks: 100% hydrophytic vegetation, therefore the criteria are met.

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☒ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Depressional wetland that ponds water throughout the year.

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | - | - | Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Low chroma soil.

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Desktop review

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

320 meters

What watershed is the delineated wetland within?

West Branch Conewango Creek 80

Comments:

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value depressional PEM wetland with little vegetative diversity; located on the edge of a maintained yard. Inflow from surrounding up-gradient areas. Outflow to north to drain D1020. At this location drain D1020 will not lead anywhere. Water from the in the drain will not cross the agricultural field as surface water except during the most extreme rain events. Therefore this wetland is does not connect to tradition navigable waters of the US.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS/PFO<br>Transect ID: WBC88-W98<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 28 | *Ulmus americana* | T | FACW- | 2 |
| *Impatiens capensis* | H | FACW | 11 | *Carex sp.* | H | ≥FAC | 2 |
| *Onoclea sensibilis* | H | FACW | 11 | | | | |
| *Salix discolor* | S | FACW | 28 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 2 | | | | |
| *Acer rubrum* | T | FAC | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Remarks:**

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8-10 inches<br>Depth to saturated soil: 8-10 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville silt loam**

Drainage Class **Poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 10YR 3/1 | 2.5Y 5/8 | 3%, small, faint | Moist silt loam |
| 10-14 | B | 2.5Y 4/2 | 2.5Y 3/1<br>10YR 5/6 | 2%, large, distinct<br>2%, small, faint | Dry silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation

Stream name (if known):

S98, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

50 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 88

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate value PSS wetland within a PFO wetland with moderate vegetative diversity. Receives water from up-gradient reverting agricultural field to the north. Drains to the south into stream S98, an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC83-W99<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 50 | | | | |
| *Viburnum recognitum* | S | FACW- | 10 | | | | |
| *Salix discolor* | S | FACW | 10 | | | | |
| *Panicum virgatum* | H | FAC | 10 | | | | |
| *Glyceria striata* | H | OBL | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Remarks:**

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 1 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Fragiaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 2.5Y 3/1 | - | - | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation and desktop review

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

200 feet

What watershed is the delineated wetland within?

West Branch Conewango Creek 83

Comments:

NWI Wetland

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, high value NWI mapped wetland with moderate vegetative diversity. High wildlife habitat and groundwater recharge and discharge function and values. Inflow from up-gradient agricultural field to south and flows northeast to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC88-W100<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 31% | *Vibernum recognitum* | S | FACW- | 6% |
| *Onoclea sensibilis* | H | FACW | 18% | | | | |
| *Veratrum viride* | H | FACW+ | 12% | | | | |
| *Carex sp.* | H | >FAC | 12% | | | | |
| *Typha latifolia* | H | OBL | 12% | | | | |
| *Equisetum arvense* | H | FAC | 6% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 3 inches in logging ruts | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: n/a inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville silt loam**

Drainage Class **Poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 7.5YR 2/1 | n/a | n/a | Silt loam |
| 8-12 | B | 10YR 5/1 | 10YR 5/6 | 10%, many small, distinct | Silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

S98, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

50 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 88

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW** ☒ **P-RPW**
- ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Medium size PEM wetland with moderate vegetative diversity, wildlife habitat, and groundwater recharge/discharge functions and values. Located on a slightly west sloping hillside. Receives water from west side of wetland corridor, culvert drains through and out into stream S98 on east side of corridor. Ultimately reaching an unnamed tributary to West Branch Conewango Creek.**

**FEATURE ID : WBC88-S98**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5-20-08

State: NY

Observers: D. Crawley, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _West Branch Conewango Creek 88_____

Stream Flow Direction _South_____

Width (ft) (water's edge to water's edge) _2 feet_____

Width (ft) (bank to bank) _12 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : WBC88-S98**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: *Impatiens capensis* |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | n/a ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| *Direction when facing downstream: _South_____ | | | | |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W98 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Water strider |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _Yes_____ | | | | Comments: |
| Description of Erosion: _Exposed roots_____ | | | | |

Comments:

**Perennial stream associated with wetland W98 flowing south along the survey corridor.**

Sector B

Cluster 6

Wetland Datasheets

UD101, W101, W101a, W101b, W102, W112, W113

Stream Datasheets

S101

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: May 29, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: Upland<br>Transect ID: WBC103-UD101<br>Status: NA |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Viburnum recognitum | S | FACW | 21% | Solidago rugosa | H | FAC | 7% |
| Acer rubrum | T | FACW | 7% | Potenilla canadensis | H | FACU | 21% |
| Acer saccharum | T | FACU | 11% | | | | |
| Robinia pseudoacacia | T | FACU- | 7% | | | | |
| Malus sp. | T | FACU | 10% | | | | |
| Prunas serotina | T | FACU | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 38%

Remarks:

**Hydrophytic vegetation present?** ☐ Yes ☒ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: Surface inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Historic logging ruts, holds some surface water runoff in natural depression typified by minor pit and mound topography | |

**Wetland hydrology present?** ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 3-12 | A | 10yr 5/4 | | | Slighly moist silt loam with few oxidized root zones | |
| 0-3 | O | | | | Slightly moist peat | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☐ **Yes** ☒ **No**

Wetland hydrology present? ☐ **Yes** ☒ **No**

Is the sampling point within a wetland? ☐ **Yes** ☒ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on? _____

Stream name (if known): _____

Approximate distance to stream: _____

What watershed is the delineated wetland within? _____

Comments: _____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Upland area east of mapped Wetland W101 and is typified by minor pit and mound topography. Surface water runoff reverts to groundwast and/or drains northeast, beyond survey corridor. Pockets of wet soils but area is dominated by viburnum and fruit trees, apple, cherry and sugar maples.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC101-W101<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Viburnum recognitum* | S | FACW- | 33 | *Acer rubrum* | T | FACW+ | 2 |
| *Glyceria striata* | H | OBL | 8 | *Malus* sp. | T | UPL | 2 |
| *Carex crinita* | H | OBL | 11 | | | | |
| *Solidago rugosa* | H | FAC | 16 | | | | |
| *Fragaria virginiana* | H | FACU | 16 | | | | |
| *Juncus effusus* | H | FACW+ | 8 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: at surface inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 7.5YR 3/2 | n/a | n/a | Silt loam |
| 6-12 | B | 2.5Y 5/4 | 10YR 5/8 | 3%, small, faint | Moist silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observations

Stream name (if known):

S101, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

Abutting

What watershed is the delineated wetland within?

West Branch Conewango Creek 88/101

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate value PSS depressional wetland, with little vegetative diversity. Wetland associated with stream S101 and multiple drainage patterns. Receives water via S101 and outlet via S101 and several drains, to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: May 29, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC101-W101a<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 10% | | | | |
| *Solidago rugosa* | H | FAC | 15% | | | | |
| *Juncus effusus* | H | FACW+ | 15% | | | | |
| *Viburnum recognitum* | S/H | FACW | 10% | | | | |
| *Carex* sp. | H | >=FAC | 30% | | | | |
| *Viola cuculata* | H | FACW+ | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: Surface inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: Surface inches<br>Depth to saturated soil: 0-7 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | O | - | - | - | PEAT |
| 3-7 | A | 10yr 3/1 | - | - | Saturated silty clay |
| 7-12+ | B | 2.5y 3/1 | 7.5yr 5/8 | 3% médium, distinct | Moist, silty clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation _____

Stream name (if known):

__S101, Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

_____0 feet_____

What watershed is the delineated wetland within?

_____WBC101_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☒ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Small, moderate value PEM wetland with moderate vegetative diversity, entering survey corridor from west.**

**Draind D101 flows northeast along southern boundary of wetland, becoming stream S101 northeast of wetland boundary. Wetland receives water via drain D101 from southwest and overland flow from north, south and west. Discharges via surface runoff and D101 to S101 to the northeast.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: May 29, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC101-W101b<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex scirpoidea* | H | FACU | 50% | | | | |
| *Solidago rugosa* | H | FAC | 12% | | | | |
| *Anthoxamthum odoratum* | H | FACU | 25% | | | | |
| *Viburnum recognitum* | H | FACW | 12% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: 0-4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10 yr 2/1 | - | - | Saturated Silt loam |
| 4-8 | B | 10yr 2/2 | 5yr 5/8 | 10% small, distinct | Moist, Silty clay loam |
| 8-12+ | C | 10yr 5/4 | 2.5yr 4/8 | 40% large, distinct | Moist, silty clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation _____

Stream name (if known):

__S101_____

Approximate distance to stream:

____40 meters_____

What watershed is the delineated wetland within?

_____WBC101_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _Isolated_____

**Rationale/Remarks:**

**Moderate size, low value PEM/PSS wetland with little vegetative diversity; associated with natural depression at bottom on hill. Receives surface water runoff via drain D101b and drains north via D101b to groundwater with no connection to traditionally navigable waters.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Side of road | Community ID: PFO 1/4<br>Transect ID: WBC97-W102<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Acer rubrum* | T | FACW+ | 30% | | | | |
| *Tsuga canadensis* | T | FACU | 30% | | | | |
| *Ulmus Americana* | T | FACW- | 18% | | | | |
| *Betula alleganiensis* | T | FAC | 3% | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 18% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class **Poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | O | 10YR 2/1 | n/a | n/a | Silt loam with small particulate matter (PDOM) |
| 4-8 | A | 10YR 4/1 | 7.5YR 4/6 | 20% many large, distinct | Silt loam |
| 8-14 | B | 2.5Y 6/2 | 10YR 6/8 | 10%, many small, distinct | Silty clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Desktop review_____

Stream name (if known):

__Unnamed tributary to West Branch Conewango Creek___

Approximate distance to stream:

_100m_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Conewango Creek 97_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**
☐ **confined** ☒ **overland sheet flow**
☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value, PFO characterized by pit and mound topography, with moderate-low vegetative diversity. Drains northwest outside of corridor area, assumed to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: June 2, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: WBC97-W112<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 25% | *Acer rubrum* | T | FACW | 16% |
| *Impatiens capensis* | H | FACW | 16% | *Rosa multiflora* | H | FACU | 4% |
| *Osmunda cinnamomea* | H | FACW | 12% | | | | |
| *Veratrum viride* | H | FACW- | 8% | | | | |
| *Solidago rugosa* | H | FAC | 8% | | | | |
| *Malus* sp. | T | FACU | 8% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS: 100%**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches<br>Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Ashville Silt Loam**

Drainage Class **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10yr 2/2 | 2.5yr 4/8 | 3% small, distinct | Saturated Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (Few Mg)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Up-gradient Observation _____

Stream name (if known):

__S101, Unnamed tributary to West Branch Conewango Creek___

Approximate distance to stream:

____Abutting_____

What watershed is the delineated wetland within?

_____WBC101_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Moderate size, high value, PEM wetland with high vegetative diversity, located in upland forest. Mapped portion of wetland begins as a riparian wetland within stream S101a and extends north northeast beyond survey corridor to a larger wetland complex. Drain D112 and D112a branch off from S101a through apple trees and provide hydrology for abundant vegetation. Both drains reach larger wetland complex during high rain events.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: June 2, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: WBC97-W113<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Onoclea sensibilis | H | FACW | 15% | Fraxinus pennsylvanica | T | FACW | 10% |
| Impatiens capensis | H | FACW | 10% | Acer rubrum | T | FACW+ | 10% |
| Equisetum leucolepis | H | FACW+ | 10% | Fagus grandifolia | T | FAC+ | 5% |
| Solidago rugosa | H | FAC | 15% | Tsuga canadensis | T | FACW | 5% |
| Caltha palustris | H | OBL | 10% | | | | |
| Potentilla canadensis | H | FACW | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches<br>Depth to free water in pit: 8 inches<br>Depth to saturated soil: 6 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-7 | A | 10yr 2/1 | 10yr ¾ | 5% small, distinct | Very moist silt loam | |
| 7-14 | B | 10yr 3/1 | 2.5yr 5/8 | 5% small, distinct | Very moist silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation _____

Stream name (if known):

__S602, Unnamed tributary to West Branch Creek_____

Approximate distance to stream:

____0.2miles_____

What watershed is the delineated wetland within?

_____WBC97_____

Comments:

_____

_____

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☒ **overland sheet flow**

☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Large, moderate value, PFO ¼ wetland with emergent understory, with high vegetative diversity. Receives water via surface runoff and through groundwater seeps (Drains D113, D113a, D113b) from upland hillside to the west. Drains via overland flow to the east towards stream S602 outside of corridor, as well as reverting to groundwater.**

**FEATURE ID : WBC101-S101**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5-21-08

State: NY

Observers: D. Crawley, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _WBC101_____

Stream Flow Direction _____Northeast_____

Width (ft) (water's edge to water's edge) ___2'_____

Width (ft) (bank to bank) _4-6'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : WBC101-S101**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Solidago, Juncus* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 4 ft left bank |
| | | | | 8 ft right bank |
| *Direction when facing downstream: _Northeast_ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W101 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? __No_ | | | | If yes, list: |
| Evidence of Erosion? __No_ | | | | Comments: |
| Description of Erosion: _ | | | | |

Comments: Northeast flowing stream within wetland W101. Begins as drain with high, dense vegetation (Solidago, Juncus). Begins to channel into stream and continues outside survey corridor.

Sector B

Cluster 7

Wetland Datasheets

W603, W700

Stream Datasheets

S1535

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, H. Childs | Date: 05/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC103-W700<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 40% | | | | |
| *Equisetum arvense* | H | FAC | 20% | | | | |
| *Solidago rugosa* | H | FAC | 15% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/1 | n/a | n/a | Saturated silt loam with 30% PDOM | Refused on rocks at 10 inches |
| 4-10 | B | 10YR 3/1 | 10YR 6/8 | 3% small, distinct | Moist silty clay loam | |
| | | | 10YR 6/2 | 1% small, faint | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Observation

Stream name (if known): S602
S602, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:
224 meters

What watershed is the delineated wetland within?
West Branch Conewango Creek 103

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PEM wetland with little vegetative diversity, resulting from a groundwater seep at the edge of a forested area. Drains northeast via drain D700 and discrete overland flow across open field, ultimately reaching stream S602, an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge/discharge functions and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC103-W603<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 8 | | | | |
| *Impatiens capensis* | H | FACW | 40 | | | | |
| *Fraxinus excelsior* | T | <FAC | 2 | | | | |
| *Aster novae-angliae* | H | FACW+ | 50 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☒ Other: _In rut_____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/1 | n/a | n/a | Silty clay, concretions | |
| 5-12 | B | 10YR 4/3 | n/a | n/a | Sandy clay, concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Desktop analysis_____

Stream name (if known):

__S1535 Unnamed tributary to West Branch Conewango Creek___

Approximate distance to stream:

__125 meters__

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Conewango Creek 103

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface** ☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined** ☐ **confined** ☐ **overland sheet flow** ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity. Wetland is depressional and possibly manmade from vehicle. Wetland likely flows southeast via discrete overland flow to S1535, an unnamed tributary to West Branch Conewongo Creek.**

**FEATURE ID : WBC103-S1535**

## STREAM DATA SHEET

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5-21-08

State: NY

Observers: H. Childs, B. Smith

### Stream Characteristics

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☐
Ephemeral ☒

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ____WBC103_____

Stream Flow Direction _____North_____

Width (ft) (water's edge to water's edge) ___1-3'_____

Width (ft) (bank to bank) _5'_____

### Bottom Characteristics

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

### Size Class

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

### Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC103-S1535**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Solidago sp.* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0-1 ft left bank |
| | | | | 0-1 ft right bank |
| *Direction when facing downstream: ___North__ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? __No_____ | | | | If yes, list: |
| Evidence of Erosion? __No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments: Ephemeral stream, datapoint (point closest to road centerline) is a headwaters of stream, at groundwater seep.

Sector B

Cluster 8

Wetland Datasheets

W116

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: June 4, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WBC100-W116<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Onoclea sensibilis | H | FACW | 20% | | | | |
| Impatiens capensis | H | FACW | 15% | | | | |
| Solidago rugosa | H | FAC | 15% | | | | |
| Salix sp. | T | FACW | 30% | | | | |
| Cornus amomum | S | FACW | 10% | | | | |
| Rubus hispidus | H | FACW | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: NA inches<br>Depth to saturated soil: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10yr 2/1 | 5YR 4/6 | 1% small, faint | Very moist silt loam |
| 8-14+ | B | 10yr 6/3 | 5yr 5/8 | 10, large, distinct | Moist silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (Few Fe)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Desktop review_____

Stream name (if known):

__Unnamed tributary to West Branch Creek_____

Approximate distance to stream:

_____270 meters_____

What watershed is the delineated wetland within?

_____WBC100_____

Comments:

_____

_____

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Moderate size and value PFO wetland with moderate vegetative diversity, located near top of hill. Receives water via surface water runoff and drain D116 from upgradient agricultural fields near wetland W116-3, W116-11 and W116-14. Slopes northwest draining into drain D116, which drains north to unnamed tributary to West Branch Conewango Creek, beyond survey corridor. Moderate groundwater recharge/discharge and sediment/toxicant retention function and value.**

Sector B

Cluster 9

Wetland Datasheets

W115, W595, W596

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: June 3, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC52-W115<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 80% | | | | |
| *Phalaris arundinacea* | H | FACW | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 3" inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: surface inches<br>Depth to saturated soil: 0-4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Langford silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Fragiochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | O | - | - | - | Dense vegetation roots, PDOM ~70% |
| 4-12 | A | 10yr 3/2 | Gley 1 4/5g | 3% large distinct | Saturated silt loam |
| | | | Gley 2 4/5b | 1%, large, distinct | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation _____

Stream name (if known):

__Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

____250 meters_____

What watershed is the delineated wetland within?

_____WBC52_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☒ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Small, low value PEM with little vegetative diversity, associated with agricultural drainage swale. Receives water via drain tile from up-gradient agricultural field southeast of wetland W115-1 and from surrounding area runoff. Drains south and west via drain D115 (beyond survey corridor) to an unnamed tributary to West Branch Conewango Creek. Moderate groundwater recharge/discharge and sediment/toxicant retention function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC52-W595<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Scirpus cyperinus* | H | FACW+ | 20 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 60 | | | | |
| *Solidago rugosa* | H | FAC | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-3 | A | 10YR 2/2 | 10YR 4/3 | Large, distinct | Silty clay, concretions | Oxidized rhizospheres |
| 3-12 | B | 10YR 3/2 | 10YR 4/3 | Large, distinct | Silty clay, concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Mapped review

Stream name (if known):

S98, an unnamed tributary to West Branch Creek

Approximate distance to stream:

150m

What watershed is the delineated wetland within?

West Branch Conewango Creek 52

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:
- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Small to moderate size, low value depressional PEM wetland, with little vegetative diversity. Receives inflow via surface flow from north. Outflow via confined/discrete flow to stream S98, an unnamed tributary to West Branch Conewango Creek, outside of corridor.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC56-W596<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Scirpus cyperinus* | H | FACW+ | 10 | | | | |
| *Eleocharis* sp. | H | FACW | 10 | | | | |
| *Solidago* sp. | H | FAC | 80 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0-12 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/2 | --- | --- | Silty clay |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observations and watershed map review

Stream name (if known):

S598, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

400m

What watershed is the delineated wetland within?

West Branch Conewango Creek 56

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

Small to moderate size, low value, depressional PEM wetland, with little vegetative diversity, located within drainage that runs perpendicular across access road. Runoff from upland inactive field/pasture running east to west. Ultimately drains to unnamed tributary to West Branch Conewango Creek.

Sector B

Collection Line

Wetland Datasheets

W114, W597, W598, W599, W600, W601, W602, W604

Stream Datasheets

S598, S602

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: May 29, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC108-W114<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW | 30% | | | | |
| *Carex* sp. | H | FACW | 20% | | | | |
| *Viburnum recognitum* | S | FACW | 10% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS: 100%**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches<br>Depth to free water in pit: 8 inches<br>Depth to saturated soil: 6 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC90-W597<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus* sp. | H | FACW | 50 | | | | |
| *Festuca* sp. | H | FAC | 30 | | | | |
| *Phalaris arundinacea* | H | FACW | 20 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-10 inches<br>Depth to free water in pit: 0-12 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10 | A | 10YR 2/1 | --- | --- | Silty clay | |
| 10-12+ | B | 10YR 3/1 | --- | --- | Clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S598, Unnamed tributary to west branch conewango creek

Approximate distance to stream:

150m

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 90

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☒ **no surface flow**

Flow is:

- ☐ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Wetland moderate size and value depressional PEM wetland with little vegetative diversity. Located in an inactive corner of an agricultural field. Receives inflow from north overland flow. Moderate amphibian habitat. No outlets observed.

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 7.5yr 3/2 | 7.5yr 5/6 | | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Topographic Map _____

Stream name (if known):

__Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

_____450 meters_____

What watershed is the delineated wetland within?

_____WBC108_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☒ **other NONE**

Explain: _ _____

**Rationale/Remarks:**

**Small, low value, linear PEM/PSS wetland with little vegetative diversity. Associated with a natural swale in a shrub field. Receives water via surface water runoff and from drain D114 inflow at north and south ends. No outlets observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Sector/Cluster: B<br>Community ID: PEM<br>Transect ID: WBC90-W598<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 4 | | | | |
| *Festuca* sp. | H | FACU | 5 | | | | |
| *Phalaris arundinacea* | H | FACW | 90 | | | | |
| *Tsuga canadensis* | T | FACU | 1 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation:<br>inches | Oxidized Root (live roots)<br>Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit:<br>inches<br>Depth to saturated soil:<br>inches | FAC Neutral: ☒ | Water-stained Leaves:<br>☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fluvaquents-Udifluvents complex, frequently flooded**

Drainage Class **Poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Fluvaquents**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 2/1 | 10YR 3/6 | Many, medium, distinct | Fine silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observations

Stream name (if known):

S598, an unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

Abutting

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 90

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Small to moderate sized, low value depressional PEM wetland located within stream S598 floodplain. Inflow and outflow via S598, an unnamed tributary to West Branch Conewango Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Sector/Cluster: B<br>Community ID: PEM in forest<br>Transect ID: WBC90-W599<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Betula alleghaniensis* | T | FAC | 10 | | | | |
| *Betula ×caerulea* | T | FAC | 10 | | | | |
| *Tsuga canadensis* | T | FACU | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-6 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 12 inches<br>Depth to saturated soil: 0-12 inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | A | 10YR 2/1 | --- | --- | Mucky mineral |
| 2-8 | B | 10YR 4/1 | --- | --- | Silty clay |
| 8-12 | C | 10YR 4/1 | --- | --- | Silty clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Watershed map review

Stream name (if known):

S598, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

350 meters

What watershed is the delineated wetland within?

West Branch Conewango Creek 90

Comments:

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☒ **other**

Explain: None, isolated

**Rationale/Remarks:**

Small to moderate, low value, depressional PEM wetland with little vegetative diversity, located in forested area. Determination is a wetland based on hydrology and soils, although there is no vegetation to support. No outlets observed.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/20/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Sector/Cluster: B<br>Community ID: PEM in forest<br>Transect ID: WBC90-W600<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Erythronium americanum* | H | FACU | 20 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Impatiens capensis* | H | FACW | 20 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-3 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 11 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/1 | --- | --- | Mucky mineral | |
| 5-12 | B | 10YR 5/4 | --- | --- | Sandy clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Watershed map review

Stream name (if known):

S598, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

350m

What watershed is the delineated wetland within?

West Branch Conewango Creek 90

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Large, low value, PEM wetland with little vegetative diversity, located in forested area. Wetland is located in depressional areas between hummocks. Collect water from surrounding hemlock-hardwood forest, supporting saturated conditions. Outflow likely to north to S598, an unnamed tributary to West Branch Conewango Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forest<br>Transect ID: WBC90-W601<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Matteuccia struthiopteris* | H | FACW | 20 | | | | |
| *Impatiens capensis* | H | FACW | 20 | | | | |
| *Tsuga canadensis* | T | FACU | 20 | | | | |
| *Fagus grandifolia* | T | FACU | 20 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 60%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: <0.5 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/1 | n/a | n/a | Mucky clay |
| 4-12 | B | 10YR 5/4 | n/a | n/a | Silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Watershed map review

Stream name (if known):

_S602,_Unnamed tributary to West Branch Conewango Creek___

Approximate distance to stream:

_200m, (S602, an unnamed tributary to WBC)

What watershed is the delineated wetland within?

_West Branch Conewango Creek 90

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: ___None, Isolated

**Rationale/Remarks:**

**Moderate to large size, low value, PEM wetland with little vegetative diversity, located in a drainage area in forested area. No outlets observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC103-W602<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Impatiens capensis* | H | FACW | 60 | | | | |
| *Senecio aureus* | H | FACW | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-0.5 inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Riparian to S602 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 2/1 | n/a | n/a | Saturated mucky peat | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Visual observation of channel

Stream name (if known):

S602, Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

Abutting

**Watershed Relationship**

What watershed is the delineated wetland within?

West Branch Conewango Creek 103

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☐ **ephemeral surface**
- ☒ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value riparian PEM, with little vegetative diversity. Receives inflow and outflow via stream S602, an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 05/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☐ Yes ☒ No<br>Is the site significantly disturbed (atypical situation)? ☒ Yes ☐ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Side of road | Community ID: PEM/PSS<br>Transect ID: WBC108-W604<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW | 20 | | | | |
| *Solidago* sp. | H | FAC | 20 | | | | |
| *Viburnum recognitum* | S | FACW- | 20 | | | | |
| *Salix discolor* | S | FACW | 10 | | | | |
| *Acer rubrum* | T | FACW+ | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 12 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10YR 3/2 | n/a | n/a | Mucky mineral | |
| 4-12 | B | 10YR 3/2 | n/a | n/a | Silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Topographic Map

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek

Approximate distance to stream:

250m

What watershed is the delineated wetland within?

WBC108

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Very large, moderate value PEM/PSS wetland with moderate vegetative diversity. Connects to culvert inflows and outflows into an unnamed tributary to West Branch Conewango Creek.**

**FEATURE ID: WBC90-S598**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5/19/08

State: NY

Observers: H. Childs, B. Smith

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: West Branch Conewango Creek 90

Stream Flow Direction Southeast

Width (ft) (water's edge to water's edge) 10

Width (ft) (bank to bank) 10

**Bottom Characteristics**

Substrate Type
- ☒ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☐ 0 – 6"
- ☒ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☒ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID: WBC90-S598**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: Southeast | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W598 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? Yes | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? Yes | | | | |
| Description of Erosion: Slight along meanders | | | | |

Comments:
Perennial stream, trash pile to the north has significant runoff into stream when precipitation is present.

**FEATURE ID : WBC103-S602**

## STREAM DATA SHEET

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Conewango Creek

Date: 5-21-08

State: NY

Observers: H. Childs, B. SMith

### Stream Characteristics

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___WBC103____

Stream Flow Direction _____East_____

Width (ft) (water's edge to water's edge) ___3-10'____

Width (ft) (bank to bank) _5-20'_____

### Bottom Characteristics

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

### Size Class

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

### Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC103-S602**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Impatiens capensis* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0 ft left bank 4-8 ft right bank |
| *Direction when facing downstream: ___East___ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? __Yes, minor_____ | | | | If yes, list: |
| Evidence of Erosion? __Minor_____ | | | | Comments: Forested |
| Description of Erosion: __Some exposed roots___ | | | | |

Comments:

**Perennial stream, associated with riparian wetland W602 within its banks.**

# Sector B

## Cluster 4

### Wetland Photos

W92

### Drain Photos

NA

### Stream Photos

S92

### Turbine Location Photos

T7

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1509: Wetland W92 from WD92 (Upstream PEM portion)
Direction of View: Southeast



Date: May 20, 2008
Location P1510: Wetland W92 from WD92 (Downstream where blowout begins to channelize)
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1511: Wetland W92 and Stream S92 (upstream) from SD92
Direction of View: South



Date: May 20, 2008
Location P1512: Wetland W92 and Stream S92 (downstream) from SD92
Direction of View: North



Date: May 20, 2008
Location P1513: T7
Direction of View: North



Date: May 20, 2008
Location P1514: T7
Direction of View: West



Date: May 20, 2008
Location P1515: T7
Direction of View: South



Date: May 20, 2008
Location P1516: T7
Direction of View: East

# Sector B

## Cluster 5

### Wetland Photos

W93, W94, W95, W96, W97, W98, W99 and W100

### Drain Photos

NA

### Stream Photos

S98

### Turbine Location Photos

T8, T9 and T15

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1517: Wetland W93 from WD93
Direction of View: Southeast



Date: May 20, 2008
Location P1518: Wetland W93 from WD93
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1519: Wetland W94 from WD94
Direction of View: West



Date: May 20, 2008
Location P1520: Wetland W95 from WD95
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1521: Wetland W95 from WD95
Direction of View: South



Date: May 20, 2008
Location P1522: Wetland W96 from WD96
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1523: Wetland W96 from southeast of W96-6
Direction of View: West



Date: May 20, 2008
Location P1542: Wetland W99 from culverted area northwest of WD99
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1543: Wetland W99 from culvert northwest of WD99
Direction of View: Northeast



Date: May 20, 2008
Location P1537: T8
Direction of View: North



Date: May 20, 2008
Location P1538: T8
Direction of View: West



Date: May 20, 2008
Location P1539: T8
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1540: T8
Direction of View: East



Date: May 20, 2008
Location P1524: Wetland W97 from W97-1
Direction of View: East



Date: May 20, 2008
Location P1529: Stream S98 (upstream) from SD98
Direction of View: North



Date: May 20, 2008
Location P1530: Wetland W98 from WD98
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P1531: Wetland W98 from reverting agricultural field, east of wetland
Direction of View: West



Date: May 21, 2008
Location P1544: Wetland W100 from WD100 (up-gradient)
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 21, 2008
Location P1545: Wetland W100 from WD100, down gradient where wetland drains to Stream S98
Direction of View: West



Date: May 20, 2008
Location P1533: T9

Direction of View: North



Date: May 20, 2008
Location P1534: T9
Direction of View: West



Date: May 20, 2008
Location P1535: T9

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008

Direction of View: South



Date: May 20, 2008
Location P1536: T9
Direction of View: East



Date: June 2, 2008
Location P1615:  Potential bat hibernacula
Direction of View: NA

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P968: T15
Direction of View: North




Date: May 21, 2008
Location P969: T15
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P970: T15
Direction of View: South




Date: May 21, 2008
Location P971: T15
Direction of View: East

# Sector B

## Cluster 6

### Wetland Photos

W101, W101a, W101b, W102, W112 and W113

### Drain Photos

D113

### Stream Photos

S101

### Upland Data Photos

UD101

### Turbine Location Photos

T11, T13 and T14




Date: May 21, 2008
Location P992: T14
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P993: T14
Direction of View: West




Date: May 21, 2008
Location P994: T14
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P995: T14
Direction of View: East



Date: June 2, 2008
Location P1614: Wetland W114 from northeast of W114-6
Direction of View: North



Date: May 21, 2008
Location P1550: Wetland W101 from WD101
Direction of View: West



Date: May 21, 2008
Location P1551: Wetland W101 from WD101
Direction of View: East




Date: May 21, 2008
Location P996: T13
Direction of View: North




Date: May 21, 2008
Location P997: T13
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P998: T13
Direction of View: South




Date: May 21, 2008
Location P999: T13
Direction of View: East



Date: May 21, 2008
Location P1556: Stream S101 from SD101
Direction of View: Northeast



Date: May 21, 2008
Location P1556a: Stream S101 from SD101
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 29, 2008
Location P1595: Wetland W101b from north of W101b-8
Direction of View: Southwest



Date: May 29, 2008
Location P1596: Wetland W101b from north of W101b-8
Direction of View: North



Date: May 29, 2008
Location P1597: Drain D101 inflow to Wetland W101a and PSS beyond survey corridor
Direction of View: Southeast



Date: May 29, 2008
Location P1598: Inflow from Wetland W101a at W101a-104
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 29, 2008
Location P1599: Wetland W101a draining northeast via Drain D101 to larger wetland complex beyond survey corridor, from 20’ west of W101a-12
Direction of View: Northeast



Date: June 2, 2008
Location P1600: Upland Datapoint UD101 from 30’ southwest of UD101
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 2, 2008
Location P1601:  Stream S101-1a inflow and Wetland W112
Direction of View: South



Date: June 2, 2008
Location P1602: Wetland W112, PEM portion in apple trees
Direction of View: East



Date: June 2, 2008
Location P1603: Stream S101-1a and Wetland W112 continuing northeast beyond survey corridor
Direction of View: North Northeast



Date: June 2, 2008
Location P1604: Drain D112 from southwest of W112-4
Direction of View: East



Date: June 2, 2008
Location P1605: Drain D112a from approximately 40’ north of W112-4
Direction of View: Northeast



Date: June 2, 2008
Location P1610: South end of Wetland W113, draining east via wet logging road
Direction of View: East



Date: June 2, 2008
Location P1611: Wetland W113 from northeast of W113-25
Direction of View: Northeast



Date: June 2, 2008
Location P1612: Wetland W113 from WD113
Direction of View: East



Date: June 2, 2008
Location P1613: Wetland W113 from WD113
Direction of View: West



Date: May 21, 2008
Location P1557: Wetland W102 from south of WD102
Direction of View: Northeast



Date: May 21, 2008
Location P1558: Wetland W102 from south of WD102
Direction of View: Southeast



Date: June 2, 2008
Location P1606: T11
Direction of View: North



Date: June 2, 2008
Location P1607: T11
Direction of View: West



Date: June 2, 2008
Location P1608: T11
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 2, 2008
Location P1609: T11
Direction of View: East

.

# Sector B

**Cluster 7**

**Wetland Photos**

W602, W603 and W700

**Drain Photos**

D1534 and W1536

**Stream Photos**

S602 and S1535

**Turbine Location Photos**

T16 and T17




Date: May 21, 2008
Location P964: Stream S602 from Access Road 7 centerline
Direction of View: East




Date: May 21, 2008
Location P965: Stream S602 from Access Road 7 centerline
Direction of View: West




Date: May 21, 2008
Location P966: Existing road culverted across Stream S602, from Access Road 7 centerline
Direction of View: South




Date: May 21, 2008
Location P967: Wetland W602 with Stream S602 in left of view
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 21, 2008
Location P972: Drain D1534
Direction of View: North



Date: May 21, 2008
Location P973: Drain D1534
Direction of View: South




Date: May 21, 2008
Location P974: Upland Datapoint UD1504
Direction of View: Northeast



Date: May 21, 2008
Location P981: Wetland W603 from between W603-2 and -3
Direction of View: North




Date: May 21, 2008
Location P977: T16
Direction of View: North




Date: May 21, 2008
Location P978: T16
Direction of View: West




Date: May 21, 2008
Location P979: T16
Direction of View: South




Date: May 21, 2008
Location P980: T16
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P982: Groundwater seep where S1535 originates
Direction of View: South




Date: May 21, 2008
Location P983: Stream S1535 from SD1535
Direction of View: North




Date: May 21, 2008
Location P984: Drain D1536 from D1536-1
Direction of View: South




Date: May 21, 2008
Location P985: Drain D1536 from D1536-1
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 22, 2008
Location P2000: Wetland W700
Direction of View: East




Date: May 22, 2008
Location P2001: Wetland W700
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 22, 2008
Location P2002: Wetland W700
Direction of View: West




Date: May 21, 2008
Location P986: T17
Direction of View: North




Date: May 21, 2008
Location P987: T17
Direction of View: West




Date: May 21, 2008
Location P988: T17
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 21, 2008
Location P989: T17
Direction of View: East

# Sector B

**Cluster 8**

**Wetland Photos**

W116

**Drain Photos**

D116

**Stream Photos**

NA

**Turbine Photos**

T68



Date: June 4, 2008
Location P1620: T68
Direction of View: North



Date: June 4, 2008
Location P1622: T68
Direction of View: West



Date: June 4, 2008
Location P1624: T68
Direction of View: South



Date: June 4, 2008
Location P1620: T68
Direction of View: East



Date: June 4, 2008
Location P1628: Southeast edge of Wetland W116 adjacent to agricultural field
Direction of View: Northeast



Date: June 4, 2008
Location P1629: Wetland W116 and runoff inflow near W116-11
Direction of View: North



Date: June 4, 2008
Location P1630: Wetland W116 and Drain D116 inflow
Direction of View: South



Date: June 4, 2008
Location P1631: Wetland W116 and groundwater seep inflow
Direction of View: Southeast



Date: June 4, 2008
Location P1632: Wetland W116 and Drain D116 extending north beyond survey corridor
Direction of View: Northeast



Date: June 4, 2008
Location P1633: Wetland W116-14 from 30' northeast of W116-14
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 4, 2008
Location P1634: North edge of Wetland W116
Direction of View: West

:

# Sector B

## Cluster 9

### Wetland Photos

W115, W595 and W596

### Stream Photos

NA

### Drain Photos

D115, D1530 and D1531

### Turbine Location Photos

T18, T19, T20 and T21

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P939: T18
Direction of View: North




Date: May 20, 2008
Location P940: T18
Direction of View: West




Date: May 20, 2008
Location P941: T18
Direction of View: South




Date: May 20, 2008
Location P942: T18
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P938: Drain D1531 where it crosses Access Road 9
Direction of View: East




Date: May 20, 2008
Location P936: Wetland W596 from WD596
Direction of View: North




Date: May 20, 2008
Location P937: Wetland W596 from WD596
Direction of View: South




Date: May 20, 2008
Location P932: T19
Direction of View: North




Date: May 20, 2008
Location P933: T19
Direction of View: West




Date: May 20, 2008
Location P934: T19
Direction of View: South




Date: May 20, 2008
Location P935: T19
Direction of View: East




Date: May 20, 2008
Location P928: Drain D1530 from D1530-3
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P929: Drain D1530 from D1530-3
Direction of View: West




Date: May 20, 2008
Location P930: Wetland W595 from WD595
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P931: Wetland W595 form WD595
Direction of View: North



Date: June 3, 2008
Location P1616:  Drain D115 inflow from W115
Direction of View: Northwest



Date: June 3, 2008
Location P1617: Drain outflow from W115-2
Direction of View: South




Date: May 20, 2008
Location P943: T20
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P944: T20
Direction of View: West




Date: May 20, 2008
Location P945: T20
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P946: T20
Direction of View: East




Date: May 20, 2008
Location P947: T21
Direction of View: North




Date: May 20, 2008
Location P948: T21
Direction of View: West




Date: May 20, 2008
Location P949: T21
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P950: T21
Direction of View: East

# Sector B

**Collection Line**

**Wetland Photos**

W114, W597, W598, W599, W600, W601 and W604

**Stream Photos**

NA

**Drain Photos**

D1530 and D115

**Turbine Location Photos**

NA




Date: May 20, 2008
Location P962: Wetland W601 from W601-21
Direction of View: West




Date: May 20, 2008
Location P963: Wetland W601 from W601-25
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 20, 2008
Location P960: Wetland W600 from W600-25
Direction of View: North




Date: May 20, 2008
Location P959: Wetland W599 from north of WD599
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P956: Wetland W598 from WD598
Direction of View: West



Date: May 20, 2008
Location P957: Wetland W598 at connection to Stream S598 from WD598
Direction of View: East




Date: May 20, 2008
Location P953: Stream S598 from SD598, at collection line crossing
Direction of View: Southwest




Date: May 20, 2008
Location P954: Stream S598 from SD598
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P955: Stream S598 from SD598
Direction of View: Northwest




Date: May 20, 2008
Location P952: Wetland W597 from WD597
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 20, 2008
Location P951: Wetland W597 from WD597
Direction of View: Southwest




Date: May 21, 2008
Location P990: Wetland W604 from WD604
Direction of View: West




Date: May 21, 2008
Location P991: Wetland W604 from WD604
Direction of View: Northwest



Date: June 2, 2008
Location P1614: Wetland W114 from northeast of W114-6
Direction of View: North

# C Sector C

Sector C

Cluster 10

Wetland Datasheets

UD1501, W525, W526

Stream Datasheets

S526

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, & A. Marciano | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: UPL<br>Transect ID: WBC23-UD1501<br>Status: Non-Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 5 | | | | |
| *Geranium sp.* | H | FACU | 5 | | | | |
| *Solidago sp.* | H | FAC | 5 | | | | |
| *Poa sp.* | H | FACU | 10 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: <50%

Remarks:

**Hydrophytic vegetation present?** ☐ Yes ☒ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 1 inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 1 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☐ Yes ☒ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14+ | A | 7.5YR 2.5/1 | 7.5YR 4/6 | 1% small, faint | Silty loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☐ **Yes** ☒ **No**

Rationale for decision/Remarks: Marginal at best.

**Wetland Determination**

Hydrophytic vegetation present? ☐ **Yes** ☒ **No**
Hydric soils present? ☐ **Yes** ☒ **No**
Wetland hydrology present? ☐ **Yes** ☒ **No**
Is the sampling point within a wetland? ☐ **Yes** ☒ **No**

**Watershed Relationship NA**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

**NA**

What is this based on?
_NA_

Stream name (if known):
_NA_

Approximate distance to stream:
_NA_

What watershed is the delineated wetland within?
_NA_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Area is a drain with some vegetation. Wide swale down hillside. Slope is ~10%. Soils poor. Lot of grass, some unknown weedy species. Some wetland vegetation was observed, but upland grasses also observed. Very little mottling observed at low depths (14-15) in soil. Due to presence of surface runoff from recent rains, drain D5503 was mapped within the vicinity of the upland data point.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 5/2/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): H. Childs, B. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: WBC130-W525 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 5% | | | | |
| *Veratrum viride* | H | FACW | 2% | | | | |
| *Solidago sp.* | H | ≥FAC | 15% | | | | |
| *Solidago rugosa* | H | FAC | 5% | | | | |
| *Solidago graminifolia* | H | FAC | 2% | | | | |
| *Solidago gigantea* | H | FACW | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☒ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fluvaquents-Udifluvents complex, frequently flooded**

Drainage Class **Poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Fluvaquents**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 7.5yr 2.5/1 | 7.5yr 4/4 | Few, faint | 0-10" Silty clay/10+ Clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field and Desktop Review _____

Stream name (if known):

_Unnamed tributary to West Branch Creek_____

Approximate distance to stream:

_Abutting_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Creek 130_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value PEM wetland, with high to moderate vegetative diversity. Located at bottom of hill east of Turbine 25. Wetland abuts stream S526 to the north. Drains to S526, ultimately to unnamed tributary to West Branch Creek and retains toxins before reaching S526.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 5/2/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): H. Childs, B. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM/PSS |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: WBC24-W526 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15% | | | | |
| *Veratrum viride* | H | FACW | 20% | | | | |
| *Solidago* sp. | H | ≥FAC | 15% | | | | |
| *Salix discolor* | S | FACW | 10% | | | | |
| *Matteuccia struthiopteris* | H | FACW | 15% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): Riparian to Wetland W526 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-12+ | A | 10yr 2/1 | 5yr 4/6 | 2% small, distinct | Saturated silt clay with lots of woody debris |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation_

Stream name (if known):

_Unnamed tributary to West Branch Creek_

Approximate distance to stream:

_Riparian_

What watershed is the delineated wetland within?

_West Branch Creek 24_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value PEM/PSS wetland, with moderate vegetative diversity. Located within Stream S526. Moderate floodplain, habitat, toxicant retention value. Receives inflow via western slope runoff, outflow via Stream S526 to south, ultimately to unnamed tributary to West Branch Creek.**

**FEATURE ID : WBC130-S526_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Creek

Date: 05/01/08

State: NY

Observers: H. Childs, R. Dutton, & A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: __West Branch Creek 130_____

Stream Flow Direction ____South _____

Width (ft) (water's edge to water's edge) __4 feet_____

Width (ft) (bank to bank) __7 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☒ Other

_Silty with other sediments____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : WBC130-S526_____**

**Bank Height and Slope**

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _Northeast_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☐ | 0 -20% (0-11°) | ☐ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☒ | 100% + (46°+) | ☒ |

Evidence of Pollution? _____No_____
Presence of Riffle/Run/Pools? ____Riffle_____
Evidence of Erosion? _____Yes_____
Description of Erosion: _Exposed tree roots_____
Comments:

**Associated Habitat**

Riparian Vegetation ☐ Yes ☒ No
If yes, list:
Approximate Riparian Width (facing d.s.) ft left bank
ft right bank
Aquatic Vegetation ☒ Yes ☐ No
If yes, list: 1 unidentified

Associated Wetland ☒ Yes ☐ No
If yes, list: Wetland W526

Aquatic Organisms ☐ Yes ☒ No
If yes, list:

Riparian/Terrestrial Organisms ☐ Yes ☒ No
If yes, list:

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

Comments:
Perennial stream, associated with riparian wetland W526 and abuts W525 to the north. Stream flows south at edge of turbine buffer.
Species include: ***Salix sp., Solidago sp*. (at least 2), *Aquilegia vulgaris, Erythronium americanum***

Sector C

Cluster 11

Wetland Datasheets

W522, W562

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, & A. Marciano | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC35-W522<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 60 | *Viburnum recognitum* | S | FACW- | 2 |
| *Solidago gigantea* | H | FACW | 5 | | | | |
| *Solidago rugosa* | H | FAC | 5 | | | | |
| *Juncus effusus* | H | FACW+ | 2 | | | | |
| *Salix* sp. | S | >FAC | 1 | | | | |
| *Onoclea sensibilis* | H | FACW | 1 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 inches<br>Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain):<br>Wet agricultural field that collects water from north and east. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 2/1 | 10YR 7/8, 10YR 5/8 | 5% small, distinct 5% large, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation of stream across street (outside survey corridor)

Stream name (if known):

Unnamed tributary to West Branch Creek

Approximate distance to stream:

300 feet

What watershed is the delineated wetland within?

West Branch Creek 35

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland W522 is large PEM in an inactive agricultural field, with dominant plant *Phalaris arundinacea*. Inflow from north via drain D522, and surface water runoff from the north and east. Inflow also from drain D522a from south. Connects with roadside ditch at culvert drainage under Pope Hill Road. The drainage ditch (outside survey corridor) turns to a stream about 300 feet west of Pope Hill Road. This flows to an unnamed tributary to West Branch Creek. Moderate value and diversity. May filter and/or retain some agricultural runoff that drains towards the stream referenced above.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC35-W562<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15 | *Equisetum palustre* | H | FACW | 5 |
| *Phalaris arundinacea* | H | FACW+ | 15 | *Potentilla simplex* | H | FACU- | 10 |
| *Solidago gigantea* | H | FACW | 10 | *Fragaria virginiana* | H | FACU | 10 |
| *Viburnum recognitum* | H | FACW- | 5 | *Solidago canadensis* | H | FACU | 5 |
| *Salix sp.* | S | ≥ FAC | 15 | *Taraxacum officinale* | H | FACU- | 5 |
| *Cornus stolonifera* | H | FACW+ | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 64%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: at surface inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Miniature hummocks carved out by small-scale drain patterns | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/1 | --- | --- | Saturated silt loam |
| 8-12+ | B | 2.5Y 5/3 | 10YR 6/8 | 25%, large, distinct | Saturated silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Low chroma in A horizon

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation. Well defined channel with rocky substrate, but no flow at time of delineation

Stream name (if known):
Tributary to West Branch Creek

Approximate distance to stream:
500 feet

What watershed is the delineated wetland within?
West Branch Creek 35

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:
- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate value PEM with 2 moderate sized willow shrubs, with high vegetative diversity, located with in an unused agricultural field. Mixed vegetation (wet and upland) but small hummocky ground surface with intertwining tiny drains indicate long term saturated conditions. Topography slopes west to Pope Hill Road, where surface flow collects at culvert and drains west to tributary to West Branch Creek.**

Sector C

Cluster 12

Wetland Datasheets

W511, W512, W513, W514, W515

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM with Vernal Pool<br>Transect ID: WBC128-W511<br>Status: Isolated, see remarks below. |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex sp.* | H | >FAC | 10 | | | | |
| *Juncus effusus* | H | FACW+ | 5 | | | | |
| *Agrostis sp.* | H | >FAC | 10 | | | | |
| *Equisetum palustre* | H | FACW | 2 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: 70% Open Water

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area holds water | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☐ Yes ☒ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 2.5YR 4/1 | 5YR 4/6 | 10%, small, distinct | Saturated clay loam with organic matter and roots |
| 5-10+ | B | 2.5YR 4/2 | 2.5YR 6/8 | 5%, large, distinct | Super saturated clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Desktop research, topographic review_____
Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek_____
Approximate distance to stream:
_1000 feet_____
What watershed is the delineated wetland within?
_ West Branch Conewango Creek 128_____
Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: ___None, Isolated_____

**Rationale/Remarks:**

**Small to moderate size open water PEM in agricultural field with moderate vegetative diversity. Vernal pool qualities, but no fauna species evident except one Spring Peeper. Depressional area with no inflow observed, outflow to the southwest via surface flow which returns to groundwater outside the corridor within about 300 ft. Isolated, Pope Hill Road prevents further surface flow to the southwest.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM associated with pond<br>Transect ID: WBC128-W512<br>Status: Isolated, see comments |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Phalaris arundinacea* | H | FACW | 30 | | | | |
| *Agrostis sp.* | H | >FAC | 30 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: 20% Open Water and unidentified species

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0.5-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Landowner appears to have dug out most of wetland to create pond. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 10 YR 5/1 | 10YR 6/8 | 2%, small, distinct | Saturated clay loam with oxidized root zones |
| 7-12+ | B | 2.5YR 5/1 | 10YR 6/8 | 20%, small, distinct | Super saturated clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

_Approximately 1150 feet _____

What watershed is the delineated wetland within?

_ West Branch Conewango Creek 128_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _ Isolated in well-defined depression _____

**Rationale/Remarks:**

**Small PEM abutting a pond that appears to have been dug where the wetland formerly extended. Low diversity but good open water habitat. Frogs observed. Inflow via surface runoff. Outflow to pond. No connection to any other waters observed. Fish and one underwater salamander observed in pond.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: WBC10-W513<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex sp*. | H | >FAC | 5 | Viburnum recognitum | S | FACW- | 2 |
| *Echinocystis lobata* | H | FAC | 2 | | | | |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Matteuccia struthiopteris* | H | FACW | 10 | | | | |
| *Pteridium aquilinum* | H | FACU | 2 | | | | |
| *Acer rubrum* | T | FAC | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks: ~50% unvegetated / standing water at time of delineation

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 1-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area. Tree growth on hummocks. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | - | - | - | Saturated peat |
| 2-4 | A | 5Y 3/1 | | | Saturated silt loam with some peat |
| 4+ | B | 2.5Y 6/1 | 10YR 6/8 | 5% small, distinct | Moist silt loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

__field observation_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

_ 1000 feet_____

What watershed is the delineated wetland within?

_ West Branch Conewango 10_____

Comments:

_____

_____

Flow relationship to associated stream:

☒ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, high value PEM/PFO in forested area with *Acer rubrum* on hummocks, with high vegetative diversity. Mostly PEM. Receives surface runoff from sloping field to the west. No outflow to streams observed, but surface flow during heavy rains flows west from Wetland W513 to Wetland W514, which drains via Drain D514 to Wetland W 515, which likely has surface connection to an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☒ Yes ☐ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Small Berm used for residential target shooting is located within wetland | Community ID: PEM with 3 small elms<br>Transect ID: WBC10-W514<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 2 | | | | |
| *Carex sp.* | H | >FAC | 2 | | | | |
| *Juncus effusus* | H | FACW+ | 5 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |
| *Solidago gigantea* | H | FACW | 2 | | | | |
| *Scirpus cyperinus* | H | FACW+ | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: Many unidentifiable grasses. Some unvegetated areas. Three small *Ulmus americana*.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☒ on Leaves and grass | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 10 inches<br>Depth to saturated soil: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | O | - | - | - | Peat & organic |
| 3-7 | A | 2.5Y 5/1 | 7.5YR 5/8 | 1% small | Silty loam with concreations |
| 7+ | B | 5Y 6/2 | 7.5YR 4/6 | 50% large | Silty clay loam with small concreations |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: In B Horizon small mottles of Gley 2 2.5/SPB around roots

**Wetland Determination**

| | | |
|---|---|---|
| Hydrophytic vegetation present? | ☒ **Yes** | ☐ **No** |
| Hydric soils present? | ☒ **Yes** | ☐ **No** |
| Wetland hydrology present? | ☒ **Yes** | ☐ **No** |
| Is the sampling point within a wetland? | ☒ **Yes** | ☐ **No** |

What is this based on?

__Field observation_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

_ 1000 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_ West Branch Conewango Creek 10_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_ _____

_____

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _Describes outflow to Wetland W515 only_____

**Rationale/Remarks:**

**Moderate to large size, moderate value PEM, with moderate vegetative diversity, located downhill from a field at forest's edge. Berm present in middle of wetland used for target shooting which affects quality of wetland. Some small *Ulmus americana* present within wetland. Part of wetland is in slight depression. Inflow is from the east sloping field surface runoff and from wetland W513 during heavy rains. Outflow drains north via drain D514 towards a portion of wetland W515 outside the corridor. Likely drains through wetland W515 to an unnamed tributary to West Branch Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS/PFO<br>Transect ID: WBC10-W515<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Caltha palustris* | H | OBL | 30 | *Salix discolor* | S | FACW | 10 |
| *Onoclea sensibilis* | H | FACW | 15 | *Ulmus americana* | T | FACW- | 5 |
| *Juncus effusus* | H | FACW+ | 5 | *Viburnum recognitum* | S | FACW- | 2 |
| *Carex* sp. | H | >FAC | 5 | | | | |
| *Veratrum viride* | H | FACW+ | 2 | | | | |
| *Solidago gigantea* | H | FACW | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present in small areas_____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | O | - | - | - | Organic |
| 3-9 | A | 2.5Y 3/1 | | | Silty loam with very few concretions |
| 9+ | B | 2.5Y 5/2 | 10YR 4/6 | 15% small | Silty clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

_ 400 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_ West Branch Conewango Creek 10_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface** ☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined** ☐ **confined** ☐ **overland sheet flow** ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Very large, high value mixed wetland, with high vegetative diversity, with existing farm road running through. Inundation areas Some inundated areas but mostly saturated, where tadpoles and amphibian eggs were observed. Some large trees scattered throughout area. The wetland extends very far to the north and east outside the corridor. No inflow or outflow was observed but topography suggests some type of surface flow to the north to an unmapped stream outside the corridor, ultimately connecting to an unnamed tributary of West Branch Creek.**

Sector C

Cluster 13

Wetland Datasheets

W500, W501, W502, W503, W504, W505, W506

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM with few willow shrubs.<br>Transect ID: WBC23-W500<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 30% | | | | |
| *Juncus effusus* | H | FACW+ | 20% | | | | |
| *Solidago spp.* | H | FAC | 40% | | | | |
| *Salix discolor* | S | FACW | 10% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

Solidago likely gigantean or rugosa, too hard to tell at this time.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☒ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depression area, within tire ruts. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10+ | A | 10yr 5/1 | 10yr 5/6 | Small, discrete | Silty clay with large concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Topographic Map review _____

_____

Stream name (if known):

_Unnamed tributary to West Branch Creek_____

Approximate distance to stream:

_Approximately 660 m_____

What watershed is the delineated wetland within?

__ West Branch Conewango 23 [mapped within SVC 137, but road blocks flow to WBC23]. _____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: __None Isolated_____

**Rationale/Remarks:**

**Wetland WBC137-W500 is small, low value PEM with 2 *Salix discolor*, with moderate vegetative diversity. Receives water from east via cut drainage channel Drain D500 from farm building. No outlets observed. Wetland is likely isolated, but possible ephemeral outflow to Northwest (during heavy rain events).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23- W501<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Juncus effusus | H | FACW+ | 20% | | | | |
| Agrostis stolonifera | H | FACW+ | 60% | | | | |
| Phalaris arundinacea | H | FACW | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: n/a inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Depressional area with water-stained vegetation

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10yr 4/2 | 7.5yr 4/6 | 10-20%, large | Silty Clay with large discrete concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

____USGS Topographic Map _____

_____

Stream name (if known):

_Unnamed tributary to West Branch Conwango_____

Approximate distance to stream:

_2100 feet_____

What watershed is the delineated wetland within?

_ West Branch Conewango 23_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☒ **other**

Explain: ____ Isolated_____

**Rationale/Remarks:**

**WBC23-W501 is a small, low value PEM with low vegetative value, located in middle of an active agricultural field. Wetland is a depressional area that received water via run-off primarily from the southeast. No outlets observed, however ephemeral outflow wetland may reach an undelineated stream to the northwest during heavy rain events.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC3-W502<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 100% | | | | |
| | | | | | | | |
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| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 10yr 3/1 | 10yr 3/6 | 2-5%, small, distinct | Silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Topographic Review_

Stream name (if known):

_Unnamed tributary to West Branch Conewango_

Approximate distance to stream:

_ 2100 feet_

What watershed is the delineated wetland within?

_ West Branch Conewango 3_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: _____None Isolated_____

**Rationale/Remarks:**

**Wetland W502 is a small, low value PEM with low vegetative diversity. Wetland has minor groundwater recharge value. Receives runoff from southeast. No outlets observed, however due to gentle topography that slopes to the northwest it is possible that ephemeral runoff drains to an undelineated stream during heavy rain events.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC3-W503<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Phalaris arundinacea | H | FACW | 80% | | | | |
| Juncus effusus | H | FACW | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 10yr 3/1 | 10yr 4/4 | 2-5%, small, discrete | Silty clay |
| 10-12+ | B | 10yr 5/1 | 10yr 5/6 | 10%, small, discrete | Silty clay, with small concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_field observation/ topographic review

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Stream name (if known):

_Unnamed tributary to West Branch Conewango_____

Approximate distance to stream:

__ 1600 feet_____

What watershed is the delineated wetland within?

_ West Branch Conewango 3_____

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland W503 is a small, low value PEM with low vegetative diversity and slight groundwater recharge value. Wetland receives water via adjacent hillside runoff mostly from the southeast. No outlets observed, however ephemeral outflow could reach undelineated stream to the northwest during heavy rain events.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and Heidi Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC3-W504<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Salix sp.* | S | FACW | 20% | | | | |
| *Typha latifolia* | H | OBL | 60% | | | | |
| *Solidago sp.* | H | ≥ FAC | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10+ | A | 10yr 3/1 | 7.5yr 5/8 | 5%, few, large, discrete | Silty clay, with large concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation/ topographic map review_____

_____

____

Stream name (if known):

_Unnamed tributary to West Branch Conewango_____

Approximate distance to stream:

_Approximately 1600 feet_____

What watershed is the delineated wetland within?

_ West Branch Conewango 3_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: ____None Isolated_____

**Rationale/Remarks:**

**Wetland W504 is a moderate size and value PEM with moderate vegetative diversity. The wetland is mostly located outside the survey corridor in an active agricultural field. Wetland receives water via surface runoff from southeast. No outlets observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): Justin Zoladz and Heidi Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23-W505<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 25% | | | | |
| *Phalaris arundineacea* | H | FACW | 50% | | | | |
| *Agrostis stolonifera* | H | FACW | 25% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 10yr 3/1 | 7.5yr 6/8<br>2.5yr 4/6 | 15%, Moderate, diffuse<br>15%, Moderate, Distinct | Silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

____Fields Observation/ Topographic Map Review_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango_____

Approximate distance to stream:

_1600 feet_____

What watershed is the delineated wetland within?

_ West Branch Conewango Creek 23_____

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: _____NONE Isolated_____

**Rationale/Remarks:**

**WBC223-W505 is a small, low value PEM with low vegetative diversity, located within an active agricultural field. Wetland receives water from southeast via runoff from adjacent hillside. No outlets observed, however ephemeral runoff may reach undelineated stream to northwest. Centerline of access road crosses southeast corner of wetland.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC3-W506<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 50 | | | | |
| *Taraxacum officinale* | H | FACU- | 10 | | | | |
| *Geranium maculatum* | H | FACU | 10 | | | | |
| *Carex sp.* | H | ≥FAC | 20 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks: Wetland in agricultural field

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒<br>Juncus follows drain |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 7.5yr 5/1 | 5yr 4/6 | 20%, small, diffuse | Silty clay |
| 10-12+ | B | 2.5y 5/3 | 10yr 3/6 | 50%, small, diffuse | Silty Clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

| | | |
|---|---|---|
| Hydrophytic vegetation present? | ☒ **Yes** | ☐ **No** |
| Hydric soils present? | ☒ **Yes** | ☐ **No** |
| Wetland hydrology present? | ☒ **Yes** | ☐ **No** |
| Is the sampling point within a wetland? | ☒ **Yes** | ☐ **No** |

What is this based on?

___Topographic map review_____

_____

__

Stream name (if known):

_Unnamed tributary to West Branch Conewango_____

Approximate distance to stream:

_1600 feet_____

What watershed is the delineated wetland within?

_ West Branch Conewango 23_____

Comments:

_____

_____

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream: Both possible

- ☒ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland WBC23-W506 is moderate size and low value PEM with moderate vegetative diversity, located within an active agricultural field. Receives water via runoff from south and southwest. Surface runoff from wetland follows topography to north to an unnamed tributary of West Branch Creek.**

Sector C

Cluster 14

Wetland Datasheets

No Wetlands

Stream Datasheets

No Streams

Sector C

Cluster 15

Wetland Datasheets

W527, W528

Stream Datasheets

S1501

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 5/2/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): H. Childs, B. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: WBC21-W527 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Isolated |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 15% | *Trifolium repens* | H | FACU- | 5% |
| *Juncus effusus* | H | FACW+ | 10% | *Geranium sp.* | H | FACU | 5% |
| *Carex sp.* | H | ≥FAC | 5% | | | | |
| *Solidago graminfolia* | H | FAC | 5% | | | | |
| *Solidago gigantea* | H | FACW | 5% | | | | |
| *Cruciata sp.* | H | FACU | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 62.5%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: na inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 6 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): Depressional area in field that holds waters | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-11 | A | 2.5y 4/2 | 10yr 6/6 | Small, distinct | Saturated Silt loam | |
| 11+ | B | 2.5y 5/3 | 10yr 5/6 | 5%, medium, distinct | Moist Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field Observation (Flows to drain D1501 which flows to stream S1501)_____
Stream name (if known):
_Unnamed tributary to West Branch Conwango_____
Approximate distance to stream:
_300 feet_____
What watershed is the delineated wetland within?
_West Branch Conewango 21
_____
Comments:
**__Flow to drain is discrete, then confined as a stream**

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, low value PEM, with moderate vegetative diversity, located in middle of agricultural field which is surrounded in all directions by a ditch. Wetland is on a slight slope where water collects from surface runoff. No outlets observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 5/2/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): H. Childs, B. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: WBC25-W528 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Isolated |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 25% | | | | |
| *Juncus effusus* | H | FACW+ | 20% | | | | |
| *Carex sp.* | H | ≥FAC | 5% | | | | |
| *Salix discolor* | S | FACW | 5% | | | | |
| *Typha latifolia* | H | OBL | 15% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: 1-3 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): Depressional area that holds waters | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Langford silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Fragiochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 2.5y 5/1 | 7.5yr 5/8 | 30% small, distinct | Moist to saturated silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation _____

Stream name (if known):

_Unnamed tributary to West Branch Conewango_____

Approximate distance to stream:

_1000 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Conewango 25_____

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow is:

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

- ☒ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value depressional PEM, with moderate vegetative diversity. Grass field to north and agricultural field to south. No inflow or outflow observed. Appears isolated due to level topography and depressional wetland. Tadpoles observed in inundated areas.**

**FEATURE ID : WBC21-S1501 _____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Creek

Date: 5/2/08

State: NY

Observers: H. Childs, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _Flows generally west with small meanders_

Tributary is: Natural ☒ Manipulated ☐

Watershed: __West Branch Creek 21_____

Stream Flow Direction _____West_____

Width (ft) (water's edge to water's edge) _____2-5_____

Width (ft) (bank to bank) _____5-15_____

**Bottom Characteristics**

Substrate Type
- ☒ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☒ Other

__Cobble_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☒ other: Line of exposed roots along stream banks
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC21-S1501 _____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: *Impatiens capensis, clintonia borealis*, algae, moss |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 1 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 1 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _West_____ | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Insect larve, snails, one salamander |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _Yes, some trash discarded in channel (metal)_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? ___No_____ | | | | If yes, list: |
| Evidence of Erosion? _____Yes_____ | | | | |
| Description of Erosion: _Exposed roots, minor undercutting_ | | | | |

Comments:

**Forested stream at data point (*Tsuga Canadensis, Acer rubrum, Prunus serotina*).**

Sector C

Cluster 16

Wetland Datasheets

No Wetlands

Stream Datasheets

No Streams

Sector C

Cluster 17

Wetland Datasheets

UD1514, W531

Stream Datasheets

S1509, S1514

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton, J. Craigmile | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: UPL<br>Transect ID: WBC74-UD1514<br>Status: NA |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Acer saccharum* | S/T/H | FACU- | 15 | | | | |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Erythronium americanum* | H | FACU | 10 | | | | |
| *Polygonum sp.* | H | ≤FAC | 5 | | | | |
| *Osmunda cinnamomea* | H | FACW | 2 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: N/A inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: N/A inches<br>Depth to saturated soil: 8 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☐ **Yes** ☒ **No**

Rationale for decision/remarks: Next to D1514

**SOILS**

Map Unit Name (Series and Phase) : Fremont Silt loam

Drainage Class Somewhat poorly drained

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 2.5Y 4/3 | --- | --- | Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☐ **Yes** ☒ **No**

Rationale for decision/Remarks: Lots of gravel and sand present

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☐ **Yes** ☒ **No**

Wetland hydrology present? ☐ **Yes** ☒ **No**

Is the sampling point within a wetland? ☐ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Stream name (if known):

Approximate distance to stream:

What watershed is the delineated wetland within?

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: no flow

**Rationale/Remarks:**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton, J. Craigmile | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC47-W531<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 5 | | | | |
| *Solidago rugosa* | H | FAC | 5 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 10 | | | | |
| *Solidago graminifolia* | H | FAC | 2 | | | | |
| *Aster sp.* | H | FACU | 20 | | | | |
| *Trifolium repens* | H | FACU- | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present __very slight | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Dalton Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Fragiaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 2.5Y 4/1 | 7.5YR 4/6 | Small to medium, distinct, 20% | Silt loam, small concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (very small)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Topographic map review_____

_____

_____

Stream name (if known):

___Unnamed tributary to West Branch Conewango ___

Approximate distance to stream:

_____800 feet_____

What watershed is the delineated wetland within?

__West Branch Conewango 47

_____

Comments:

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☒ **other**

Explain: __None, Isolated_____

**Rationale/Remarks:**

**Small, low value, PEM wetland with little vegetative diversity, located in a slight depression in field. Surrounding area is agricultural fields. Fields to N, W, & S about 50 ft away all recently plowed Inflow from surrounding fields and groundwater, no outflow observed.**

**FEATURE ID :_WBC47-S1509_____**

**STREAM DATA SHEET**

| | |
|---|---|
| County: Chautauqua | Stream Name: Unnamed tributary to West Branch Creek |
| Date: 5/3/08 | State: NY |
| Observers: J. Craigmile, B. Dutton | |

**Stream Characteristics**

Perceptible Flow ☐ Yes ☒ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: __slight meanders_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _West Branch Creek 47_____

Stream Flow Direction _____South_____

Width (ft) (water's edge to water's edge) ____N/A_____

Width (ft) (bank to bank) _____8_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☒ Other

_cobble_____

Probed Stream Depth (if water present)
- ☐ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☒ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID :_WBC47-S1509_____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: *Erythronium americanum*, *Acer rubrum*. |
| ☐ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 20 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 20 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _South__ | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☒ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? ___no/dry | | | | If yes, list: |
| Evidence of Erosion? _____Yes_____ | | | | Comments: |
| Description of Erosion: ___exposed roots and scarred banks on both sides_____ | | | | |

Comments:

**Drain D1509 leads to stream S1509, D1509 definitely man made drain (makes 90° angle) to drain agricultural fields to S1509. Downstream there is flow, mayflies.**

**FEATURE ID :_WBC74-S1514_____**

**STREAM DATA SHEET**

| | |
|---|---|
| County: Chautauqua | Stream Name: Unnamed tributary to West Branch Conewango Creek |
| Date: 5/3/08 | State: NY |
| Observers: J. Craigmile, B. Dutton | |

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: __starts at seeps at field edge_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___WBC74_____

Stream Flow Direction _____South_____

Width (ft) (water's edge to water's edge) ____2-8 ft_____

Width (ft) (bank to bank) _____5-12 ft_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

_cobble_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID :_WBC74-S1514_____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Equisetum arvense, Onoclea sensibilis, Symplocarpus foetidus* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 2 ft left bank<br>2 ft right bank |
| *Direction when facing downstream: _South__ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _some debris/litter_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? ___riffles_____ | | | | If yes, list: |
| Evidence of Erosion? _____some_____ | | | | Comments: |
| Description of Erosion: ___visible roots_____ | | | | |

Comments:

Stream originates at groundwater seeps off of a agricultural field. Drains D1514 and D1514a come into stream towards edge of survey corridor.

Sector C

Cluster 18

Wetland Datasheets

No Wetlands

Stream Datasheets

No Streams

Sector C

Collection Line

Wetland Datasheets

UD1500, W507, W508, W509, W510, W516, W517, W518, W519, W523, W524, W529, W530, W532

Stream Datasheets

S530

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, & A. Marciano | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: UD1500<br>Transect ID: WBC35-UD1500<br>Status: Non-Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Malus* sp. | T | FACU | 45 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Solidago gigantea* | H | FACW | 10 | | | | |
| *Fragaria virginiana* | H | FACU | 10 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☐ Yes ☒ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0.5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Due to recent rains

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | 10YR 3/6 | 2% small, faint | Saturated silty clay | Mottles Only from 11-12 inches |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☐ **Yes** ☒ **No**
Hydric soils present? ☐ **Yes** ☒ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☐ **Yes** ☒ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_____Field Observations_____
Stream name (if known):
__NA_____
Approximate distance to stream:
_NA_____
What watershed is the delineated wetland within?
_WBC35_____
Comments:
_____
_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: __Upland area_____

**Rationale/Remarks:**

**Upland area UD1500: Some wet indicators, but overall, apple trees and very marginal soils indicate a well established upland area.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM .<br>Transect ID: WBC23-W507<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 50% | | | | |
| *Solidago gigantea* | H | FACW | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Could not identify additional vegetation due to limited growth

**Hydrophytic vegetation present?** ☒ Yes ☐ No
Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1/2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 6 inches, after 4min | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**
Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10yr 3/2 | 10yr 5/8 | 2% small, distinct | Saturated Silt loam | |
| 6-10+ | B | 10yr 5/2 | 10yr 5/8 | 20%, médium, distinct | Moist clay loam, some concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
_Field observation _____
_____

Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:
_ 100 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?
_ West Branch Conewango Creek 23_____

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:
_____
_____

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:
☒ **discrete** ☐ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Wetland WBC23-W507 is a very large , moderate value PEM with low vegetative diversity, located adjacent to hay field (north), corn field (east) and mixed hardwood forest (south). Wetland had some toxicant-retention value. Wetland occurs on gentle western slope that receives water via drain D507 and slope runoff from north and east. No channelized outflow observed, although topography and patterns of wetland vegetation extending west indicate that wetland drains west during rain events to stream in close proximity to, but not abutting W507.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23-W508<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 20% | | | | |
| *Solidago sp.* | H | ≥FAC | 58% | | | | |
| *Phalaris arundinacea* | H | FACW | 20% | | | | |
| *Salix fragilis* | S | FAC+ | 2% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches<br>Depth to free water in pit: 3 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10 | A | 10yr 3/1 | - | - | Silt clay | |
| 10- 12+ | B | 7.5yr 3/1 | 7.5yr 5/6 | 10%, small, diffuse | Silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
__Field observation _____
_____
Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek___
Approximate distance to stream:
_ 200 feet_____
What watershed is the delineated wetland within?
_ West Branch Conewango Creek 23_____
Comments:
_____
_____

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland WBC23-W508 is a moderate sized and low value PEM (with 2 willow shrubs) with low vegetative diversity, which is abutting an active agricultural field. Receives water from east via drain D508. Wetland drains via drain D508, which in heavy rain events has overland flows to D509.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz and H. Childs | Date: 4/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23-W509<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 25% | | | | |
| *Solidago gigantea* | H | FACW | 75% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒<br>In spots, mainly at groundwater seep | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit:4 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☐ Yes ☒ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 10yr 3/1 | 10yr 5/8 | 5%, small, diffuse | Silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Visual observation_____

Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:
_ 50 feet_____

What watershed is the delineated wetland within?
_ West Branch Conewango Creek 23_____

Comments:
_____
_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland WBC23-W509 is a small sized and high value PEM with low vegetative diversity. Receives inflow from groundwater seep, which forms the head waters of stream, which begins just outside survey corridor. Wetland drains via drain D509 into unnamed tributary of West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 4/22/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): Justin Zoladz and Heidi Childs | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM/PSS/PFO |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: WBC23-W510 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 20% | *Ulmus americana* | T | FACW | 5% |
| *Typha latifolia* | H | OBL | 10% | *Cornus amomum* | S | FACW | 10% |
| *Phalaris arundinacea* | H | FACW | 5% | | | | |
| *Carex crinita* | H | OBL | 5% | | | | |
| *Equisetum arvense* | S | FACW- | 10% | | | | |
| *Viburnum recognitum* | S | FACW- | 25% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Could not identify additional vegetation due to limited growth

**Hydrophytic vegetation present?** ☒ Yes ☐ No
Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**
Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-9 | A | 10yr 2/1 | - | - | Silty clay loam |
| 9-12+ | B | 10yr 2/1 | 10 yr 5/8 | 10%, small, diffuse | Silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_field observation, topographic map review_____
_____
_____

Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:
_ 500 feet_____

What watershed is the delineated wetland within?
_ West Branch Conewango Creek 23_____

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland WBC23-W510 is a large mixed wetland. The northeast PEM portion is located in an active agricultural field of low vegetative diversity and value. The middle portion of wetland is PEM/PSS and has moderate diversity and value. The west to northwest portion is a PFO with low vegetative diversity and value, with only elm trees (most are dead or dying). Wetland receives water via runoff from northeast via drains D510 and D510a. Wetland drains during heavy rain events via discrete overland flow. Topography of wetland slopes gently to the southwest toward stream associated with drain D509, although no direct connection observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs & R. Dutton | Date: 4/28/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23-W516<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago gigantea* | H | FACW | 10% | | | | |
| *Phalaris arundinacea* | H | FACW+ | 2% | | | | |
| *Fragaria virginiana* | H | FACU | 5% | | | | |
| *Veratrum viride* | H | FACW+ | 1% | | | | |
| *Onoclea sensibilis* | H | FACW | 2% | | | | |
| *Carex* sp. | H | >FAC | 2% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-9 | A | 2.5Y 3/1 | --- | --- | Silty clay loam |
| 9+ | B | 2.5Y 5/2 | 7.5YR 5/8 | Small 2% | Clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
__desktop analysis _____
_____
_____

Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:
_650 feet_____

What watershed is the delineated wetland within?
_ West Branch Conewango Creek 23_____

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: _____None, Isolated_____

**Rationale/Remarks:**

Moderately sized, low value PEM wetland, with low vegetative diversity located on slope of hill. Receives water via Drain 516 which comes in at north end. Area continues south down slight slope. No outlets observed. Wood frog found, however has a low wildlife value.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton & A. Marciano | Date: 4/28/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WBC23-W517<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Salix discolor | S | FACW | 15% | Solidago sp. | H | >FAC | 5% |
| Solidago gigantea | H | FACW | 5% | | | | |
| Juncus effusus | H | FACW+ | 5% | | | | |
| Onoclea sensibilis | H | FACW | 5% | | | | |
| Carex sp. | H | >FAC | 2% | | | | |
| Viburnum recognitum | S | FACW- | 2% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Most of wetland is inundated, though it had been steadily raining for approximately 8 hours when the site was visited

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 4/2 | --- | --- | Silt loam | |
| 8+ | B | 2.5Y 6/1 | 10YR 5/6 | | Clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
__desktop analysis _____
Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek_____
Approximate distance to stream:
_650 feet_____
What watershed is the delineated wetland within?
_West Branch Conewango Creek 23_____
Comments:
_____
_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____Flow to groundwater_____

**Rationale/Remarks:**

**Small to medium sized, low value PEM/PSS wetland with low vegetative diversity. Wetland receives water from groundwater and possible runoff flow from north. Wetland outflow to southeast to groundwater, no outlets observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton and J. Zoladz | Date: 4/29/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23-W518<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 20% | *Carex sp.* | H | >FAC | 2% |
| *Solidago gigantea* | H | FACW | 5% | | | | |
| *Juncus effusus* | H | FACW+ | 2% | | | | |
| *Onoclea sensibilis* | H | FACW | 5% | | | | |
| *Salix discolor* | H | FACW | 2% | | | | |
| *Viburnum recognitum* | S | FACW- | 2% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10yr 3/1 | - | - | Silty clay loam | |
| 0-12 | A2 | 10yr 3/1 | 10yr 5/8 | Small, 2%, distinct | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Lost of rocks in soil, also large root layer, ~5"

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
__desktop analysis_____
_____

Stream name (if known):
_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:
_____540 feet_____

What watershed is the delineated wetland within?
_West Branch Conewango Creek 23_____

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____Flow to groundwater_____

**Rationale/Remarks:**

**Moderate sized, low value PEM wetland with low vegetative diversity, located between apple trees (north) and an agricultural field (south) with gas line ROW to east and north edge. Receives water from runoff from hill no west northwest and southeast. Outflow probably to southeast during high rain events toward forest. However no outlets observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 4/30/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): R. Dutton, J. Zoladz | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM/PSS |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: WBC23-W519 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | OBL | 10% | *Viburnum recognitum* | S | FACW- | 10% |
| *Phalaris arundinacea* | H | FACW | 40% | *Solidago sp.* | H | >=FAC | 15% |
| *Juncus effusus* | H | FACW+ | 2% | *Ulmus americana* | T | FACW- | 5% |
| *Carex sp.* | H | ≥FAC | 2% | *Fraxinus pennsylvanica* | T | FACW | 2% |
| *Rubus hispidus* | H | FACW | 2% | *Hamamelis virginiana* | S | FACU | 5% |
| *Salix sp. (2)* | S | ≥FAC | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 91%

Remarks: Few small trees present, but mostly PEM/PSS

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Tire ruts full of standing water, deep ruts indicate very soft, saturated soil. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-1 | 0 | - | - | - | Moss/organic material |
| 1-10 | A | 5yr 2.5/1 | - | - | Saturated silty clay loam |
| 10+ | B | 10yr 4/1 | 10yr 4/6 | 10% small, diffuse | Saturated clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field Observation_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

_200 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Conewango 23_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface** ☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined** ☐ **confined** ☐ **overland sheet flow** ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large sized PEM/PSS with moderate wildlife value and vegetative diversity. Located within an existing cleaved ROW for a gas line which is reverting to a PSS. Wetland extends beyond survey corridor to the north and south. Receives discrete surface water runoff and possible groundwater seepage. Drains to the south forested area via various swales and logging road ruts, ultimately reaching an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, & A. Marciano | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC35-W523<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 30 | *Juncus effusus* | H | FACW+ | 10 |
| *Onoclea sensibilis* | H | FACW | 2 | | | | |
| *Salix sp.* | S | >FAC | 15 | | | | |
| *Rubus hispidus* | S | FACW | 5 | | | | |
| *Veratrum viride* | H | FACW+ | 2 | | | | |
| *Viburnum recognitum* | H | FACW- | 25 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 6 inches<br>Depth to saturated soil: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain):<br>Tire ruts. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/1 | 10YR 5/8 | 1% small, distinct | Saturated silty clay | |
| 8-12+ | B | 10YR 4/1 | 10YR 5/8 | 5% small, distinct | Very moist silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
Visual observation of stream across street (outside corridor)
Stream name (if known):
Unnamed tributary to West Branch Conewango Creek
Approximate distance to stream:
300 feet
What watershed is the delineated wetland within?
West Branch Conewango Creek 35
Comments:

Flow relationship to associated stream:
☒ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:
☒ **discrete** ☐ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**
Explain:

**Rationale/Remarks:**

**Large PEM/PSS with high diversity but low value. Forested portion occurs outside corridor to the east. Slight depressional area at the base of east and south sloping hills, and numerous tire ruts are very spongy. No inflow/outflow observed but prevalence of wet vegetation extending east and southeast indicates wetland W523 drains east-southeast during heavy rains to an unnamed tributary to West Branch Creek. Wetland W523 is in very close proximity to wetland W519 at W519-23 and W519-22. In this area the boundary separating them consists of upland trees interspersed with wetland herbaceous plants. Both wetlands could be considered one in the same.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, & A. Marciano | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC23-W524<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 80 | | | | |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/1 | 10YR 4/6 | 1% small, faint | Saturated silt loam |
| 8-12 | B | 10YR 4/1 | 10YR 5/8 | 10%, large, distinct | Saturated clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

__Desktop analysis of modeled watersheds_____

Stream name (if known):

_ Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

_140 feet_____

What watershed is the delineated wetland within?

_West Branch Conewango Creek 23_____

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Very small, low value PEM draining east via surface runoff into wet Hemlock/Hardwood forest. Receives surface water runoff from the west. Connection to any stream could not be verified, but wet hummock forest continuing east suggests continual runoff to stream located east of wetland.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Dutton | Date: 5/2/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC45-W529<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10% | *Solidago gigantea* | H | FACW | 5% |
| *Salix* sp. | S | >FAC | 20% | *Cornus sericea* | S | FACW+ | 2% |
| *Typha latifolia* | H | OBL | 15% | *Equisetum arvense* | H | FAC | 5% |
| *Solidago graminfolia* | H | FAC | 5% | *Juncus effusus* | H | FACW+ | 5% |
| *Solidago canadensis* | H | FACU | 5% | *Fragaria* sp. | H | FACU | 10% |
| *Cruciata* sp. | H | FACU | 5% | *Scirpus cyperinus* | H | FACW | 2% |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present __very slight_____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ FEW | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Some small ponded areas throughout the wetland, 1-2" deep and some have oil sheen present. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-1 | O | - | - | - | Organic root layer |
| 1-9 | A | 2.5y 3/1 | 7.5 yr 4/6 | 5%, few, faint | Silty clay loam, very small concretions |
| 9+ | B | 2.5y 5/3 | 10yr 4/6 | 10% few, faint | Silty clay, small concretions |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

___Desktop analysis_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

__580 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_West Branch Conewango Creek 45_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Flow is:

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, moderate to high value PEM/PSS wetland with high vegetative diversity. Receives surface water runoff from east and west and water from groundwater. Wetland drains west via drain D529 (vegetative swale that joins D1505 which flows west). Ultimately reaching an unnamed tributary to West Branch Conewango Creek. High wildlife value, large songbird population, and numerous ant hills located throughout wetland.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Dutton | Date: 5/2/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WBC45-W530<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10% | | | | |
| *Salix sp.* | S | >FAC | 20% | | | | |
| *Solidago rugosa* | H | FAC | 20% | | | | |
| *Caltha palustris* | H | OBL | 15% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present __at D530 (natural)_ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ FEW | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Wetland W530 is riparian to stream S530. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10yr 2/1 | 7.5yr 4/6 | 5%, large and small, distinct | Saturated silty clay with concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Visual observation, channel size and depth of flow _____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek____

Approximate distance to stream:

_Riparian, <1 foot_____

What watershed is the delineated wetland within?

_WBC45_____

Comments:

_____

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, moderate habitat, pollutant retention value, PEM/PSS riparian wetland to Stream S530, with low vegetative diversity. Wetland receives water via S530 which originates as outflow from Pond PO530. Pond PO530 receives inflow from Drain D530, which is the same channel as Stream S530, but does not have stream characteristics northeast of pond. S530 ultimately reaches an unnamed tributary to West Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton, J. Craigmile | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WBC45-W532<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 95 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 5/2 | 7.5YR 5/8 | Small, distinct, few | Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

__Desktop Analysis_____

_____

Stream name (if known):

_Unnamed tributary to West Branch Conewango Creek_____

Approximate distance to stream:

_360 feet_____

What watershed is the delineated wetland within?

_WBC45_ _____

Comments:

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: __no flow_____

**Rationale/Remarks:**

**Small, low value PEM with little vegetative diversity, located within an unplowed agricultural field. Inflow from drainage of surrounding fields, no outlets were observed.**

**FEATURE ID : WBC45-S530 _____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Creek

Date: 5/2/08

State: NY

Observers: H. Childs, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Except at culvert
Manipulated ☐

Watershed: __West Branch Creek 45_____

Stream Flow Direction _____South _____

Width (ft) (water's edge to water's edge) ____1-3_____

Width (ft) (bank to bank) _____1-4_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

– _____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☒ other: Some undercutting
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WBC45-S530 _____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Solidago* sp. , *Salix* sp. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0-1 ft left bank<br>0-1 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _South____ | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W530 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Newt, tadpoles |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? ___Very small, minor riffles | | | | If yes, list: |
| Evidence of Erosion? _____Yes_____ | | | | |
| Description of Erosion: _Exposed roots, some undercutting_ | | | | |

Comments:

**Stream S530 begins as drain D530 northeast of Pond PO530, it then flows out of PO530 as a stream and cuts through wetland W530 continuing south to unnamed tributary to West Branch Conewango Creek**

**Cluster 10**

**Wetland Photos**

W525 and W526

**Drain Photos**

NA

**Stream Photos**

S526

**Turbine Location Photos**

T25



Date: May 1, 2008
Location P599: T25
Direction of View: North



Date: May 1, 2008
Location P600: T25
Direction of View: West



Date: May 1, 2008
Location P601: T25
Direction of View: South



Date: May 1, 2008
Location P602: T25
Direction of View: East



Date: May 1, 2008
Location P603: Wetland W525 from W525-2
Direction of View: South



Date: May 1, 2008
Location P604: Wetland W525 from W525-2
Direction of View: North



Date: May 1, 2008
Location P605: Stream S526 from SD526
Direction of View: South



Date: May 1, 2008
Location P606: Stream S526 from SD526
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P607: Wetland W526 with Stream S526 in background from W526-2 and -3
Direction of View: Southeast



Date: May 2, 2008
Location P608: Wetland W526 with Stream S526 in background, from W526-2 and -3
Direction of View: East




Date: May 10, 2008
Location P791: Wetland W562 from W562-3
Direction of View: Southwest




Date: May 10, 2008
Location P792: Wetland W562 from W562-3
Direction of View: Northeast

# Sector C

## Cluster 11

### Wetland Photos

W522 and W562

### Drain Photos

D1500

### Turbine Location Photos

T23 and T24



Date: May 1, 2008
Location P580: Wetland W522 from WD522
Direction of View: East



Date: May 1, 2008
Location P581: Wetland W522 from WD522
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P582: Southwest corner of Wetland W522 where it connects to calverted drain
Direction of View: Southwest




Date: May 10, 2008
Location P791: Wetland W562 from W562-3
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 10, 2008
Location P792: Wetland W562 from W562-3
Direction of View: Northeast



Date: May 1, 2008
Location P591: T24
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P: T24
Direction of View: West



Date: May 1, 2008
Location P: T24
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P: T24
Direction of View: East



Date: May 1, 2008
Location P587: T23
Direction of View: North



Date: May 1, 2008
Location P588: T23
Direction of View: West



Date: May 1, 2008
Location P589: T23
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P590: T23
Direction of View: East




Date: April 28, 2008
Location P565: Wetland W516 from W516-15
Direction of View: North




Date: April 28, 2008
Location P566: Wetland W516 and Drain D516 from W516-15
Direction of View: Southwest




Date: April 28, 2008
Location P567: Wetland W517, southern extent from W517-3
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 28, 2008
Location P568: Wetland W517 from W517-3
Direction of View: Northeast



Date: April 29, 2008
Location P570: Wetland W517 from W517-7
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P571:  Wetland W518 between W518-1 and -13
Direction of View: Southwest



Date: April 29, 2008
Location P572: Wetland W518 between W518-1 and -13
Direction of View: Southeast



Date: May 1, 2008
Location P583: PEM/PSS portion of Wetland W523 from WD523
Direction of View: South

# Sector C

**Cluster 12**

**Wetland Photos**

W511, W512, W513, W514, W515

**Drain Photos**

D1500

**Pond Photos**

PO512

**Turbine Location Photos**

T22



Date: April 25, 2008
Location P542: Drain D1500 from, D1500-2
Direction of View: West



Date: April 25, 2008
Location P543: Drain D1500 from D1500-2
Direction of View: East



Date: April 25, 2008
Location P544: Wetland W511 from W511-2
Direction of View: West



Date: April 25, 2008
Location P545: Wetland W511 from W511-2
Direction of View: East




Date: April 25, 2008
Location P546: Wetland W512 from W512-1
Direction of View: East




Date: April 25, 2008
Location P547: Pond PO512 from W512-1
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 25, 2008
Location P548 Pond PO512 and Wetland W512 from W512-2
Direction of View: North




Date: April 25, 2008
Location P551: Wetland W513 from W513-1
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 25, 2008
Location P550: Wetland W513 from W513-1
Direction of View: East



Date: April 25, 2008
Location P552: Wetland W514 from W514-12
Direction of View: East



Date: April 25, 2008
Location P553: Wetland W514 from W514-12
Direction of View: North



Date: April 25, 2008
Location P554: Wetland W514 at edge of firing range berm on west side of W514, from W514-2
Direction of View:



Date: April 25, 2008
Location P556: Amphibian eggs inundated depression at Wetland W515, from W515-2
Direction of View: NA




Date: April 25, 2008
Location P557: Wetland W515, PEM/PSS/PFO portion from W515-2
Direction of View: Southwest



Date: April 25, 2008
Location P559: Wetland W515, PEM/PSS/PFO portion from W515-2
Direction of View: North



Date: April 25, 2008
Location P558: Wetland W515, PEM portion from W515-2
Direction of View: West



Date: April 25, 2008
Location P560: Wetland W515 from W515-2
Direction of View: East




Date: April 25, 2008
Location P561: T22
Direction of View: North




Date: April 25, 2008
Location P562: T22
Direction of View: West




Date: April 25, 2008
Location P563: T22
Direction of View: South




Date: April 25, 2008
Location P564: T22
Direction of View: East

# Sector C

**Cluster 13**

**Wetland Photos**

**W500, W501, W502, W503, W504, W505, W506**

**Drain Photos**

**NA**

**Turbine Location Photos**

**T26**

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P501:  Wetland W500 from W500-3
Direction of View: East



Date: April 21, 2008
Location P502: Wetland W500 from W500-3, (Machinery left)
Direction of View: West



Date: April 21, 2008
Location P503: Wetland W500 from between W500-16 and -17
Direction of View: North



Date: April 21, 2008
Location P504: Wetland W500 from between W500-16 and -17
Direction of View: Southeast




Date: April 21, 2008
Location P505: Isolated depression from W500-3 (not flagged as wetland)
Direction of View: South




Date: April 21, 2008
Location P506: Isolated depression from W500-3 (not flagged as wetland)
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P508: Wetland W501 from W501-1
Direction of View: Northwest




Date: April 21, 2008
Location P509: Wetland W502 from W502-1
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P511:  Wetland W503 from between W503-1 and -2
Direction of View: West



Date: April 21, 2008
Location P512:  Wetland W503 from between W503-1 and -2
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 21, 2008
Location P513: Wetland W504, typha swale portion at W504-4
Direction of View: North



Date: April 21, 2008
Location P515: Wetland W504 from W504-4, Emergent agricultural field portion
Direction of View: South




Date: April 21, 2008
Location P516: Wetland W505 at W505-5, where access road centerline crosses
Direction of View: Northeast



Date: April 21, 2008
Location P517: Wetland W505 at W505-5
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P522: Wetland W506 from between W506-2 and -3
Direction of View: North



Date: April 21, 2008
Location P523: Wetland W506 from between W506-2 and -3
Direction of View: Northeast




Date: April 21, 2008
Location P518: T26
Direction of View: North



Date: April 21, 2008
Location P519: T26
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P520: T26
Direction of View: South



Date: April 21, 2008
Location P521: T26
Direction of View: East

# Sector C

**Cluster 14**

**Wetland Photos**

**NA**

**Drain Photos**

**NA**

**Turbine Location Photos**

**T27**

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 22, 2008
Location P526: T27
Direction of View: North




Date: April 22, 2008
Location P524: T27
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 22, 2008
Location P528: T27
Direction of View: South




Date: April 22, 2008
Location P529: T27
Direction of View: East

# Sector C

**Cluster 15**

**Wetland Photos**

W527 and W528

**Drain Photos**

NA

**Stream Photos**

S5001

**Turbine Location Photos**

T29




Date: May 2, 2008
Location P616: Wetland W527 from WD527
Direction of View: Southeast




Date: May 2, 2008
Location P617: Wetland W527 from WD527
Direction of View: Northwest




Date: May 2, 2008
Location P618: Wetland W528 from WD528
Direction of View: North




Date: May 2, 2008
Location P619: Wetland W528 from WD528
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P614: Stream S5001 from SD5001
Direction of View: East




Date: May 2, 2008
Location P615: Stream S5001
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P609: T29
Direction of View: North




Date: May 2, 2008
Location P611: T29
Direction of View: West




Date: May 2, 2008
Location P612: T29
Direction of View: South




Date: May 2, 2008
Location P613: T29
Direction of View: East

# Sector C

## Cluster 16

### Wetland Photos

NA

### Drain Photos

NA

### Turbine Location Photos

T30, T31, T32




Date: May 3, 2008
Location P635: T30
Direction of View: North




Date: May 3, 2008
Location P636: T30
Direction of View: West




Date: May 3, 2008
Location P637: T30
Direction of View: South




Date: May 3, 2008
Location P638: T30
Direction of View: East




Date: May 3, 2008
Location P639: T31
Direction of View: North




Date: May 3, 2008
Location P640: T31
Direction of View: West




Date: May 3, 2008
Location P641: T31
Direction of View: South




Date: May 3, 2008
Location P642: T31
Direction of View: East




Date: May 2, 2008
Location P631: T32
Direction of View: North




Date: May 2, 2008
Location P632: T32
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P633: T32
Direction of View: South




Date: May 2, 2008
Location P634: T32
Direction of View: East

# Sector C

**Cluster 17**

**Wetland Photos**

W531

**Drain Photos**

D1509

**Stream Photos**

S1509 and S1514

**Turbine Location Photos**
T33, T34 and T35

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 3, 2008
Location P643: Wetland W531
Direction of View: East




Date: May 3, 2008
Location P645: Wetland W531
Direction of View: North




Date: May 3, 2008
Location P646: Drain D1509 at D1509-4
Direction of View Northeast




Date: May 3, 2008
Location P653: Stream S1509 at SD1509
Direction of View Northeast




Date: May 3, 2008
Location P654: Stream S1509 at SD1509
Direction of View Southwest




Date: May 3, 2008
Location P649: T33
Direction of View: North




Date: May 3, 2008
Location P650: T33
Direction of View: West




Date: May 3, 2008
Location P651: T33
Direction of View: South




Date: May 3, 2008
Location P652: T33
Direction of View: East




Date: May 3, 2008
Location P655:  Clump of garbage near T34
Direction of View: NA




Date: May 3, 2008
Location P656: Clump of garbage near T34
Direction of View: NA




Date: May 3, 2008
Location P657: T34
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 3, 2008
Location P658: T34
Direction of View: West




Date: May 3, 2008
Location P659: T34
Direction of View: South




Date: May 3, 2008
Location P660: T34
Direction of View: East




Date: May 3, 2008
Location P664: Stream S1514
Direction of View: Downstream




Date: May 3, 2008
Location P663: Stream S1514
Direction of View: Upstream




Date: May 3, 2008
Location P666: T35
Direction of View: North




Date: May 3, 2008
Location P667: T35
Direction of View: West




Date: May 3, 2008
Location P668: T35
Direction of View: South




Date: May 3, 2008
Location P669: T35
Direction of View: East

# Sector C

## Cluster 18

### Wetland Photos

NA

### Drain Photos

NA

### Stream Photos

NA

### Turbine Location Photos

T36

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 3, 2008
Location P670: T36
Direction of View: North




Date: May 3, 2008
Location P671: T36
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 3, 2008
Location P672: T36
Direction of View: South




Date: May 3, 2008
Location P673: T36
Direction of View: East

# Sector C

## Collection Line

### Wetland Photos

W507, W508, W509, W510, W519, W516, W517, W518, W523, W524, W529, W530, W532 and W533

### Drain Photos

D507, D508, D510, D516, D529 and D530

### Stream Photos

S530 and S533
(See Cluster 17 for S1509)

### Pond Photos

PO530

### Turbine Location Photos

NA

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 22, 2008
Location P535: Wetland W510 from W510-18, at PEM portion at collection line
Direction of View: Northwest



Date: April 22, 2008
Location P536: Wetland W510, PFO portion, from wetland data point
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 22, 2008
Location P537:  Wetland W510, PEM portion, from wetland datapoint
Direction of View: Northwest



Date: April 22, 2008
Location P538: Wetland W510, PEM portion, at wetland datapoint
Direction of View: East



Date: April 22, 2008
Location P539: Wetland W510, PSS portion, at wetland datapoint
Direction of View: Southeast



Date: April 22, 2008
Location P541: Wetland W510, PEM in agricultural field portion, where access road crosses
Direction of View: East



Date: April 22, 2008
Location P524: Wetland W507, at access road centerline
Direction of View: West



Date: April 22, 2008
Location P524a: Wetland W507, at access road centerline
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 22, 2008
Location P525: Wetland W507 and Drain D507 from W507-2
Direction of View: Southeast




Date: April 22, 2008
Location P530:  Wetland W508 and Drain D508 from W508-11
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 22, 2008
Location P532: Wetland W508, from W508-11
Direction of View: East



Date: April 22, 2008
Location P533: Wetland W509 from between W509-1 and -2
Direction of View: West



Date: April 22, 2008
Location P534: Drain D509 exiting Wetland W509 at W509-6
Direction of View: West



Date: April 22, 2008
Location P540: Drain D509 from D509-6
Direction of View: Northwest



Date: April 30, 2008
Location P573: Wetland W519, shovel centerline of collection line, from W519-18
Direction of View: North



Date: April 30, 2008
Location P574: Wetland W519, from W519-18
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 30, 2008
Location P575: Wetland W519, shovel centerline of collection line, from W519-18
Direction of View: East



Date: May 1, 2008
Location P586: Wetland W524 from north of W524-1
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P595: Upland Data UD5501
Direction of View: West



Date: May 1, 2008
Location P596: Upland Data UD5501
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P597: Soils at Upland Data UD5501
Direction of View: NA



Date: May 1, 2008
Location P598: Drain D1504 where collection line crosses (at shovel)
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P620: Wetland W529 from WD529
Direction of View: Northwest




Date: May 2, 2008
Location P621: Wetland W529 from WD529
Direction of View: Southwest




Date: May 2, 2008
Location P622: Drain D529 from between W529-15 and -16
Direction of View: Northwest




Date: May 2, 2008
Location P623: Drain D530
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P625: Drain D530
Direction of View: South




Date: May 2, 2008
Location P626: Pond PO530 at approximately 20feet west of flag Wetland W530-1
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P627: Stream S530 at S530-1
Direction of View: South




Date: May 2, 2008
Location P628: Wetland W530 from W530-3
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 3, 2008
Location P648: Wetland W532 from W532-4 and -6
Direction of View: East




Date: April 28, 2008
Location P565: Wetland W516 from W516-15
Direction of View: North




Date: April 28, 2008
Location P566: Wetland W516 and Drain D516 from W516-15
Direction of View: Southwest




Date: April 28, 2008
Location P567: Wetland W517, southern extent from W517-3
Direction of View: South




Date: April 28, 2008
Location P568: Wetland W517 from W517-3
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P570: Wetland W517 from W517-7
Direction of View: Northeast



Date: April 29, 2008
Location P571: Wetland W518 between W518-1 and -13
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P572: Wetland W518 between W518-1 and -13
Direction of View: Southeast



Date: May 1, 2008
Location P583: PEM/PSS portion of Wetland W523 from WD523
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P584: PEM/PSS portion of Wetland W523 from WD523
Direction of View: North



Date: May 1, 2008
Location P585: Forested portion of W523 from W523-7 and -8
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: May 2, 2008
Location P629: Wetland W530 from W530-3
Direction of View: East

# D Sector D

Sector D

Cluster 19

Wetland Datasheets

W533

Stream Datasheets

S533, S534

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton, J. Craigmile | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WBC107-W533<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Geum macrophyllum* | H | FACW | 5 | *Gallium sp.* | H | >FAC | 5 |
| *Iris sp.* | H | OBL | 2 | *Rubus hispidus* | H | FACW | 2 |
| *Carex sp.* | H | >FAC | 5 | *Solidago sp.* | H | >FAC | 2 |
| *Acer negundo* | T | FAC+ | 2 | *Impatiens capensis* | H | FACW | 2 |
| *Salix fragilis* | T | FAC+ | 15 | | | | |
| *Solidago gigantea* | H | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☒ on leaves and soil | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 0.5 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Dalton Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Fragiaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14+ | A | 2.5Y 3/1 | 5YR 3/6 | Small, Faint, 10% | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

Unnamed tributary to West Branch Conewango Creek (Stream S533)

Approximate distance to stream:

Riparian

What watershed is the delineated wetland within?

WBC107

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PFO riparian wetland with moderate vegetative diversity, located next to S533, with pit and mound topography. Slight hill to east where inflow comes from, as well as inflow from groundwater. Outflow, west to stream, an unnamed tributary to West Branch Conewango Creek.**

**FEATURE ID :_WBC107-S533_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to West Branch Creek

Date: 5/5/08

State: NY

Observers: J. Craigmile, R. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ small Rel. Straight ☐

Description: __slight meander on side of field_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _WBC 107_____

Stream Flow Direction _____South_____

Width (ft) (water's edge to water's edge) 2-5 ft_____

Width (ft) (bank to bank) _____2.5-6 ft_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID :_WBC107-S533_____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: (W533) *Salix fragilis*, *Acer negundo*, *Solidago sp.* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0 ft left bank 20 ft right bank |
| *Direction when facing downstream: _South__ | | | | Aquatic Vegetation ☒ Yes ☐ No |
| | | | | If yes, list: unknown |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W533 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? ___some small pools_____ | | | | If yes, list: |
| Evidence of Erosion? _____no_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Small stream meanders along side of old agricultural field. Runs under road through culvert. There is a lot of algal growth in stream.**

**FEATURE ID : NBC69-S534**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to North Branch Conewango Creek

Date: 5/5/08

State: NY

Observers: J. Craigmile, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: few scattered meanders

Tributary is: Natural ☒ & Manipulated ☒

Watershed: NBC 69

Stream Flow Direction South

Width (ft) (water's edge to water's edge) two 1 ft channels (braided)

Width (ft) (bank to bank) 12 ft

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel (very little)
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☒ shelving
- ☒ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☒ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

From W534 to surrounding upland

**FEATURE ID : NBC69-S534**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: W534, and in upland portion maple, *Rubus, Salix* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 20 ft left bank; 40 ft right bank |
| *Direction when facing downstream: South | | | | Aquatic Vegetation ☒ Yes ☐ No |
| | | | | If yes, list: In pool near flag 24: freshwater aquatic grass |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W534 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: spring peepers, other unidentified frogs |
| Evidence of Pollution? yes, private dumps | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? runs, pools | | | | If yes, list: |
| Evidence of Erosion? no | | | | Comments: |
| Description of Erosion: | | | | |

Comments:

Perennial stream, associated with riparian wetland W534. Stream S534 appears to drain the NWI wetland to the north, outside of survey corridor.

Sector D

Cluster 20

Wetland Datasheets

W42, W43, W44, W45, W46, W47, W48, W117, W534, W534A, W535, W536, W538, W539, W539A

Stream Datasheets

S44, S46

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC55-W42<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 30 | | | | |
| *Solidago gigantea* | H | FACW | 15 | | | | |
| *Salix discolor* | S | FACW | 30 | | | | |
| *Ranunculus repens* | H | FAC | 15 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-16 | A | 5YR 3/1 | 2.5YR 3/6 | 5%, large, distinct | Saturated silt loam with 40% partly decomposed organic matter | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_S46, Unnamed tributary to North Branch Conewango Creek

Approximate distance to stream:

_700 feet _____

**Watershed Relationship**

What watershed is the delineated wetland within?

_North Branch Conewango Creek 55_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PEM/PSS with moderate vegetative diversity in a broad swale between two agricultural fields. Receives water via drain D1011 (up-gradient wetland W43), surface water runoff, and from agricultural drain D42. Wetland extends north beyond the survey corridor and presumably drains to an unnamed tributary to North Branch Conewango Creek (NBC55). Moderate groundwater recharge and discharge, and toxicant filtration function and values (from the agricultural fields). Farm road crossed wetland between wetland flags W43-1 and W43-5. Some fill was used so there was slight disturbance in this wetland.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC55-W43<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 40 | *Ranunculus repens* | H | FAC | 3 |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Solidago sp.* | H | ≥FAC | 10 | | | | |
| *Viburnum recognitum* | S | FACW- | 3 | | | | |
| *Salix sp.* | S | ≥FAC | 3 | | | | |
| *Fragaria sp.* | H | FACU | 20 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 9 inches<br>Depth to saturated soil: 7 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-15 | A | 10YR 3/2 | 10YR 6/4<br>2.5YR 4/8 | 3%, small, faint<br>10%, small, distinct | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
_Observation and desktop review_____

Stream name (if known):
_S46, (Unnamed tributary to North Branch Conewango Creek)

Approximate distance to stream:
_1040 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?
_North Branch Creek 55_____

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:
- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value PEM/PSS, with moderate vegetative value, located in the middle of an east sloping agricultural field. Receives surface water runoff and possible drain tile inflow (very wet area given position on hill for only surface water inflow). Drains east via drain D43 into drain D1011 which flows to wetland W42. Presumably drains to an unnamed tributary to North Branch Conewango Creek (NBC55). Moderate groundwater recharge and discharge function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC57-W44<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 15 | | | | |
| *Juncus effusus* | H | FACW+ | 10 | | | | |
| *Phalaris arundinacea* | H | FACW | 10 | | | | |
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Cornus stolonifera* | S | FACW+ | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒<br>Riparian stream channel |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 2/2 | 7.5YR 4/6 | 3%, small, faint | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Observation_____

_____

Stream name (if known):

_S44, Unnamed tributary to North Branch Conewango Creek____

Approximate distance to stream:

_Riparian_____

What watershed is the delineated wetland within?

_NBC 57_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _Goes to groundwater._____

**Rationale/Remarks:**

**Narrow riparian wetland beginning as broad drainage swale (drain points D44-1 to D44-4) draining north between upland agricultural field and upland forest. Becomes channelized and mapped as stream S44 at wetland flag W44-104. Low vegetative diversity. Moderate groundwater recharge and discharge and toxicant filtration function and values. High amphibian habitat function and value. Two species of salamanders (*Desmognathus sp.* and *Gyrinophilus porphyriticus*) observed in stream bed .**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Zoladz | Date: 5/6/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC55-W45<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex* sp. | H | FAC | 15% | | | | |
| *Onoclea sensibilis* | H | FACW | 20% | | | | |
| *Osmunda cinnemomea* | H | FACW | 5% | | | | |
| *Glyceria striata* | H | OBL | 20% | | | | |
| *Solidago gigantea* | H | FACW | 20% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 10 inches<br>Depth to free water in pit: 6 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-3 | A | 10YR 3/1 | 5YR 4/6 | Small, distinct, 1% | Very moist silt loam | |
| 3-14 | B | 10YR 2/2 | 7.5YR 4/2 | Large, distinct, 20% | Moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Observation__

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Stream name (if known):

_S46, (Unnamed tributary to North Branch Conewango Creek)_

Approximate distance to stream:

_200 feet_

What watershed is the delineated wetland within?

__North Branch Creek 55_

Comments:

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value PEM wetland, with little vegetative diversity, located in an upland forest associated with historic logging roads (partially inundated) on slightly north facing sloping hill. Receives surface runoff from up-gradient areas. Drains north into logging road and then east via D45 into D1012 and north to stream S46. Moderate groundwater recharge and discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Zoladz | Date: 5/6/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC55-W46<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15% | | | | |
| *Glyceria striata* | H | OBL | 20% | | | | |
| *Ranunculus repens* | H | FAC | 15% | | | | |
| *Cardamine* sp. | H | OBL | 40% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
*Cardamine sp.* is *Cardamine bulbosa* or *Cardamine rotundifolia*.

**Hydrophytic vegetation present?** ☒ Yes ☐ No
Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**
Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9 | A | 2.5Y 3/2 | n/a | n/a | Silty clay loam | |
| 9-14 | B | 10YR 4/1 | 710YR 5/8 | 30%, large, distinct | Sandy clay loam with concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions - Fe
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Observation__

Stream name (if known):

_S46/Unnamed tributary to North Branch Conewango Creek____

Approximate distance to stream:

__Riparian_____

**Watershed Relationship**

What watershed is the delineated wetland within?

__North Branch Conewango Creek 55_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value PEM, with little vegetative diversity, located in riparian zone within berms of stream S46 within wooded area. Active agricultural fields to the northeast and southwest. Moderate flood alteration and wildlife habitat function and value; minor toxicant removal value. Receives water from north from wetland W45 and drains south via stream S46.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Zoladz | Date: 5/6/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC58-W47<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 40% | | | | |
| *Salix discolor* | S | FACW | 40% | | | | |
| *Salix* sp. | S | ≥FAC | 20% | | | | |
| *Equisetum arvense* | H | FAC | 15% | | | | |
| *Solidago gigantea* | H | FACW | 10% | | | | |
| *Onoclea sensibilis* | H | FACW | 15% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: N/A inches<br>Depth to free water in pit: 6 inches<br>Depth to saturated soil: 6 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/2 | n/a | n/a | Saturated silt loam with 50% PDOM | |
| 5-14 | B | 10YR 2/1 | 5YR 5/8 | Small, distinct, 5% | Moist silty clay loam | |
| | | | 7.5YR 5/4 | Large, distinct, 5% | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions - Fe
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation and desktop review

Stream name (if known):

Unnamed tributary to North Branch Conewango Creek

Approximate distance to stream:

1300 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

North Branch Conewango Creek 58 & 59

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PEM/PSS wetland, with low vegetative diversity, associated with ponds PO47 and PO47a. Receives water in a cut in northwest corner of PO47 near wetland W47-6 and drains northeast to NBC58 via drain D47 beyond survey corridor Ultimately reaching an unnamed tributary to North Branch Conewango Creek. High groundwater recharge and discharge, wildlife, amphibian, and aquatic habitat function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Zoladz | Date: 5/6/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC59-W48<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 40% | | | | |
| *Solidago canadensis* | H | FACU | 40% | | | | |
| *Juncus effusus* | H | FACW+ | 10% | | | | |
| *Solidago sp.* | H | FACW | 30% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: N/A inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 10 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/1 | 10YR 5/8 | Large, distinct, 20% | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation and desktop review

Stream name (if known):

Unnamed tributary to North Branch Conewango Creek

Approximate distance to stream:

2000 feet

What watershed is the delineated wetland within?

North Branch Conewango Creek 59

Comments:

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value and function PEM wetland, with little vegetative diversity, associated with pond PO48. Inflow comes from southwest corner of PO48. Flows through drain D48 northeast along southern pond berm. Wetland is adjacent with surface connection to unnamed tributary to North Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: June 4, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO1/4<br>Transect ID: NBC60-W117<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 25% | *Ranunculus repens* | H | FAC | 5% |
| *Impatiens capensis* | H | FACW | 20% | *Fagus grandifolia* | T | FAC+ | 5% |
| *Caltha palustris* | H | OBL | 5% | *Tsuga canadensis* | T | FACU | 5% |
| *Osmunda cinnamomea* | H | FACW | 10% | *Acer rubrum* | T/S | FACW+ | 5% |
| *Veratrum viride* | H | FACW+ | 10% | | | | |
| *Equisetum hyemale* | H | FACW+ | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: NA inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 0-3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-3 | A | 2.5y 3/1 | - | - | Saturated silty clay | |
| 4-12+ | B | 2.5y 6/3 | 7/5y 5/8 | 10% small, distinct | Moist silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions (
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation _____

Stream name (if known):

__Unnamed tributary to North Branch Conewango Creek_____

Approximate distance to stream:

_____less than 100 feet_____

What watershed is the delineated wetland within?

North Branch Conewango Creek

60_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Moderate size, high value PFO ¼ wetland with high vegetative diversity, located in headwaters of stream outside of survey corridor. Emergent vegetation surrounded by an upland forest. Receives water via surface runoff from the east and via groundwater seeps at W117-9 and between W117-11 and W117-12. Discharges via channeled runoff into mapped stream to the north outside survey corridor. High groundwater recharge/discharge function and value. Wetland is mapped in watersheds NBC60 and NBC62, but ultimately drains through NBC60.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton, J. Craigmile | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: NBC69-W534<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Caltha palustris* | H | OBL | 30 | *Onoclea sensibilis* | H | FACW | 5 |
| *Juncus effusus* | H | FACW+ | 10 | *Asclepias incarnata* | H | OBL | 5 |
| *Iris spp.* | H | OBL | 5 | *Eupatoriadelphus maculatus* | H | OBL | 20 |
| *Salix spp.* | S/T | FACW+ | 10 | *Carex spp.* | H | ≥FAC | 5 |
| *Ranunculus septentrionalis* | H | OBL | 10 | | | | |
| *Impatiens capensis* | H | FACW | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated: N/A<br>☒ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: dump on R bank, S of culvert<br>☐ Oil Sheen present | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: surface 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-12 | A | 2.5Y 4/2 | --- | --- | Silty clay loam, many fine to médium roots |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation

Stream name (if known):

S534 (unnamed tributary to North Branch Conewango Creek)

Approximate distance to stream:

riparian

What watershed is the delineated wetland within?

North Branch Conewango Creek 69

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, high value PEM/PFO wetland, with high vegetative diversity, associated with stream S534. Wetland receives water from S534 and from groundwater seep near W534-27. Drains south via S534. Upstream wetland W534a is a PFO 1/4. Linear wetland is culverted across access road. Quality of wetland is impacted by active farm fields present on east and west sides of wetland. Moderate-high toxicant retention value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): R. Dutton, J. Craigmile | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: NBC69-W534A<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Dryopteris sp*. | H | FAC | 10 | *Maianthemum canadense* | H | FAC- | 40 |
| *Onoclea sensibilis* | H | FACW | 10 | *Fagus grandifolia* | S/T | FAC+ | 10 |
| *Betula alleghaniensis* | T | FAC | 15 | *Ulmus rubra* | S/T | FAC | 15 |
| *Acer rubrum* | T | FACW+ | 20 | *Tsuga canadensis* | T | FACU | 5 |
| *Acer rubrum* | H | FACW+ | 10 | *Osmunda cinnamomea* | H | FACW | 5 |
| *Equisetum arvense* | H | FAC | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 72%

Remarks:
Many small upland areas throughout with wood fern and Canada mayflower

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ Some areas | Water Marks: ☒ on leaves | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: up to 1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ few | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | O | | | | Organic. Lots of leaf litter and roots |
| 3-8 | A | 10YR 5/2 | 7.5YR 4/6 | Few, faint, 1% | Silt loam |
| 8+ | B | 2.5Y 5/2 | 10YR 5/8 | Many, prominent, 40% | Silty clay loam. Some small concretions. |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation _____

Stream name (if known):

__S534, unnamed tributary to North Branch Conewango Creek__

Approximate distance to stream:

_20 ft_____

What watershed is the delineated wetland within?

_North Branch Conewango 69_____

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, moderate to low value, PFO ¼ wetland with high vegetative diversity, with upland hummocks throughout populated by Canada mayflower, wood fern and trees. Inflow from agricultural fields to east, and from groundwater seeps. Outflow south to wetland W534 via S534 and ultimately to an unnamed tributary to North Branch Conewango Creek. Moderate toxicant retention value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, R. Smith | Date: 05/06/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: NBC69-W535<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | *Carya ovata* | T | FACU- | 2 |
| *Tsuga canadensis* | T | FACU | 30 | *Carex spp.* | T | ≥ FAC | 2 |
| *Polystichum acrostichoides* | H | FAC- | 10 | *Dennstaedtia punctilobula* | H | UPL | 5 |
| *Caltha palustris* | H | OBL | 10 | *Dryopteris intermedia* | H | FACU | 5 |
| *Boehmeria cylindrica* | H | OBL | 2 | | | | |
| *Osmunda cinnamomea* | H | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 60%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: --- inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 10 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Alden mucky silt loam**

Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-1 | O | --- | --- | --- | Partially decomposed organic matter |
| 1-10 | A | 2.5YR 4/1 | 2.5YR 5/6 | 5%, médium, distinct | Moist silt clay |
| 10-12+ | B | 10YR 7/1 | 10YR 5/6 | 50%, large distinct | Moist silt clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

Unnamed tributary to North Branch Conewango Creek (S534)

Approximate distance to stream:

Abutting

What watershed is the delineated wetland within?

North Branch Conewango Creek 69

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, high value PFO 1/4, with moderate vegetative diversity. Wetland located upstream (North) from wetland W534/W534A and is associated with wetland and stream W534/S534. Pit and mound topography. S534 ultimately reaches to North Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, R. Smith | Date: 05/06/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: NBC69-W536<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10 | *Veratrum viride* | H | FACW+ | 5 |
| *Carex spp.* | H | >=FAC | 5 | *Erythronium americanum* | H | FACU | 15 |
| *Acer rubrum* | T | FAC | 5 | *Cardamine diphylla* | H | FACU* | 5 |
| *Tsuga canadensis* | S/T | FACU | 10 | *Maianthemum canadense* | H | FAC- | 10 |
| *Podophyllum peltatum* | H | FACU | 10 | *Impatiens capensis* | H | FACW | 15 |
| *Betula alleghaniensis* | T | FAC | 15 | *Fagus grandifolia* | S | FACU | 2 |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 58%

Remarks:
Mix of pits and hummocks with upland veg on hummocks

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In some small areas<br>Saturated in upper 12 in: ☒<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Water Marks: ☐ on<br>Drift Lines: ☐ | Sediment Deposits: ☐<br>Drainage Patterns: ☐ |
| Depth of inundation: up to 3 inches<br>Depth to free water in pit: 4 inches<br>Depth to saturated soil: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☐ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Alden mucky silt loam**
Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 7.5YR 2.5/1 | --- | --- | Silt loam | Many roots in A layer |
| 8+ | B | 10YR 3/2 | 5YR 3/4 | Few, prominent, 15% | Silty clay | Some very small concretions in B layer |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation

Stream name (if known):
S534, Unnamed tributary to North Branch Conewango Creek

Approximate distance to stream:
220 feet

What watershed is the delineated wetland within?
North Branch Conewango Creek
69

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, high value PFO 1/4 with pit and mound topography and high vegetative diversity. Associated with stream S534. Many fallen down trees in area. Inflow from groundwater seeps, from S534 and from surface runoff from slight rise to east. Outflow continuing to W537 and south to S534, ultimately to North Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, R. Smith | Date: 05/06/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC62-W538<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 95 | | | | |
| *Carex* sp. | H | ≥FAC | 2 | | | | |
| *Salix* sp. | H | ≥FAC | 2 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In places<br>Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Water Marks: ☒ on Juncus<br>Drift Lines: ☐ | Sediment Deposits: ☐<br>Drainage Patterns: ☒ |
| Depth of inundation: inches<br>Depth to free water in pit: inches<br>Depth to saturated soil: inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☐<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 2.5YR 7/2 | 7.5YR 5/1 | Médium, common, 45% | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Desktop analysis

Stream name (if known):

Unnamed tributary to North Branch Conewango Creek

Approximate distance to stream:

1500 ft

What watershed is the delineated wetland within?

North Branch Conewango Creek

60

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: None, Isolated

**Rationale/Remarks:**

**Wetland is small, low value PEM, with little vegetative diversity, located within a depression in the middle of an unused agricultural field. Inflow from gentle slopes of surrounding area. No outlets observed. Most of wetland is delineated within watershed NBC62, although a portion is located in NBC60.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, R. Smith | Date: 05/06/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC60-W539/W539A<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 15 | | | | |
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Scirpus cyperinus* | H | FACW+ | 5 | | | | |
| *Virburnum recognitum* | S | FACW- | 20 | | | | |
| *Carex sp.* | H | ≥FAC | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
7 large Viburnums

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 10YR 3/1 | --- | --- | Saturated silt loam with high OM content |
| 5-12+ | B | 2.5Y 5/1 | 7.5YR 5/8 | 15%, small, distinct | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☒ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and desktop review_

Stream name (if known):

_Unnamed tributary to North Branch Conewango Creek_

Approximate distance to stream:

_1500 feet_

What watershed is the delineated wetland within?

_North Branch Conewango Creek 60_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM/PSS, with moderate vegetative diversity, located at edge of agricultural field and woods. Receives inflow via drain D539 from west, in agricultural field. No outflow observed due to berm-like rise in topography on east side, at the start of a hummocky area. W539a is ~10' from W539 to the west. It is a small depressional pocket in agricultural field. Although it is not connected via defined channel to W539, it is considered as part of the same wetland due to close proximity and likelihood of surface runoff passing from W539a to W539.**

**FEATURE ID : NBC57-S44**

## STREAM DATA SHEET

County: Chatauqua

Stream Name: Unnamed tributary to North Branch Conewango Creek

Date: 5/5/08

State: NY

Observers: Andy Francisco, Andy Kielaszek

### Stream Characteristics

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: Narrow channel within floodplain

Tributary is: Natural ☒ Manipulated ☐

Watershed: North Branch Conewango Creek 57

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 18 inches

Width (ft) (bank to bank) 4-6 feet

### Bottom Characteristics

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

### Size Class

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

### Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : NBC57-S44**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Onoclea sensibilis, Glyceria striata* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0 ft left bank<br>3 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _North_____ | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W44 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Dusky salamander (*Desmognathus*), Spring salamander (*Gyrinophilus*) |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? Minor | | | | Comments: |
| Description of Erosion: Minor bank scour | | | | |

Comments:

**Stream starts as broad vegetated swale up gradient from wetland W44. Drain becomes channelized at W44 and turns into a channelized stream with defined bed and bank at W44-104. Flows north beyond survey corridor at stream S44-12.**

**FEATURE ID : NBC55-S46**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to North Branch Conewango Creek

Date: 5-6-08

State: NY

Observers: A.F, J.Z., A.M.

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___NBC55_____

Stream Flow Direction __Northeast_____

Width (ft) (water's edge to water's edge) _4-5'____

Width (ft) (bank to bank) _10-12'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☒ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : NBC55-S46**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _Northeast_

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☐ |
| ☐ | 21 – 50% (12-27°) | ☒ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_
Presence of Riffle/Run/Pools? _Yes_
Evidence of Erosion? _Yes_
Description of Erosion: _Slight erosion_
Comments:
Perennial RPW stream, associated with riparian wetland W46, within the banks of S46.

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No
If yes, list: Glyceria striata, Onoclea sensibilis

Approximate Riparian Width (facing d.s.) 8-10 ft left bank
ft right bank

Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☒ Yes ☐ No
If yes, list: W46

Aquatic Organisms ☒ Yes ☐ No
If yes, list: Water spiders, unknown water insects

Riparian/Terrestrial Organisms ☐ Yes ☒ No
If yes, list:

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

Sector D

Cluster 21

Wetland Datasheets

W28, W29, W30, W31, W32, W120, W121

Stream Datasheets

S31

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 5/2/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: NBC46-W28<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30% | *Betula alleghaniensis* | T | FAC | 20% |
| *Osmunda cinnamomea* | H | FACW | 20% | | | | |
| *Veratrum viride* | H | FACW+ | 15% | | | | |
| *Ulmus americana* | T | FACW+ | 15% | | | | |
| *Tsuga canadensis* | T | FACU | 20% | | | | |
| *Acer rubrum* | T | FACW+ | 40% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-16 | O | - | - | - | Saturated H3 peat | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_S31, (Unnamed tributary to North Branch Conewango Creek)

Approximate distance to stream:

_400 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_Primarily NBC46, also NBC39 and SVC142_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, high value PFO ¼ wetland, with high vegetative diversity. Receives surface runoff from surrounding higher elevations. Drains southeast via PEM portion of Wetland W28 at W28-12 to a cow pasture beyond survey corridor, ultimately reaching an unnamed tributary to North Branch Creek. High groundwater recharge and discharge and wildlife habitat values. Located across watersheds NBC39, 46 and SVC142. Mapped portion drains primarily to the south to NBC 46.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 5/2/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: NBC46-W29<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20% | | | | |
| *Osmunda cinnamomea* | H | FACW | 20% | | | | |
| *Tsuga canadensis* | T | FACU | 30% | | | | |
| *Acer rubrum* | T | FACW+ | 15% | | | | |
| *Betula alleghaniensis* | T | FAC | 15% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: Surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-16 | O | - | - | - | Saturated H3 peat | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_S31, (Unnamed tributary to North Branch Conewango Creek)

Approximate distance to stream:

_700 feet_____

What watershed is the delineated wetland within?

_SVC142 and NBC46_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, high value PFO ¼ wetland, with high vegetative diversity. Located in a natural depression on a small ridge between SVC142 and NBC46. Receives surface water runoff from up-gradient areas. Drains south at W29-6 and -7, but drains predominantly southwest (W29-1open and -18open) to NBC46, ultimately reaching an unnamed tributary to North Branch Conewango Creek. High groundwater recharge and discharge and wildlife habitat values. Multiple Red Spotted Newt sitings.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 5/2/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC46-W30<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20% | *Salix sp.* | S | ≥FAC | 10% |
| *Carex sp.* | H | FACW | 10% | *Fraxinus pennsylvanica* | T | FACW | 5% |
| *Solidago gigantea* | H | FACW | 30% | | | | |
| *Solidago canadensis* | H | FACW | 10% | | | | |
| *Scirpus cyperinus* | H | FACW | 10% | | | | |
| *Viburnum recognitum* | S | FACW- | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 3 inches<br>Depth to saturated soil: 4 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10yr 2/2 | - | - | Saturated Silt loam, 40% PDOM |
| 4-15+ | B | 10yr 2/1 | 2.5y 11/8 | 10%, small, distinct | Moist sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_S31, (Unnamed tributary to North Branch Conewango Creek)

Approximate distance to stream:

_600 feet_____

What watershed is the delineated wetland within?

__NBC46_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PEM/PSS wetland with few green ash trees on periphery and scattered throughout, with moderate vegetative diversity. Receives surface water runoff from up-gradient wetland W29 and adjacent upland areas. Drains southeast via discrete overland flow beyond Wetland W30-115 to Wetland W28 in cow pasture, ultimately reaching an unnamed tributary to North Branch Conewango Creek. Moderate groundwater recharge and discharge and wildlife habitat value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Zoladz | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC46-W31<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Carex sp.* | H | >FAC | 15 | | | | |
| *Glyceria sp.* | H | >FAC | 30 | | | | |
| *Poa sp.* | H | >FAC | 30 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 6 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 2/1 | 2.5YR 3/6 | 3% large, distinct | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation ____

Stream name (if known):

_S31, (Unnamed tributary to North Branch Conewango Creek)

Approximate distance to stream:

_Riparian_____

What watershed is the delineated wetland within?

_NBC46_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size riparian PEM wetland within the banks of stream S31. Moderate vegetative diversity. Receives water from up-gradient wetland to northwest(where stream S31 originates outside corridor), agricultural drain tile discharge near W31-3, surface runoff from drain D31, and groundwater discharge near W31-12 to W31-14. Wetland and stream continue southeast beyond survey corridor. Moderate flood alteration and moderate amphibian habitat function and value. Many tadpoles noted in stream pool where Access Road 21 crosses at existing farm road.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Zoladz | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC46-W32<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 40 | | | | |
| *Carex sp*. | H | >FAC | 30 | | | | |
| *Phalaris arundinacea* | H | FACW | 20 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-8 inches<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10YR 2/1 | - | - | Saturated silty clay loam with ~40% PDOM |
| 6-15+ | B | 10YR 6/1 | 10YR 5/6 | 15% small, distinct | Slightly moist clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_____

_____

Stream name (if known):

_Stream S31, Unnamed tributary to North Branch Conewango Creek___

Approximate distance to stream:

_200 feet_____

What watershed is the delineated wetland within?

_NBC46_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small inundated PEM on top of slightly southeast sloping hillside in a natural depression. Adjacent to forested area, down-gradient from wetland W29. Also receives surface water runoff from west from adjacent agricultural field. Drains to the southeast via discrete overland flow to stream S31. High groundwater recharge and amphibian habitat function and values. Many *Pseudacris crucifer* were heard.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A Kielaszek | Date: 6/5/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC46-W120<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 25% | | | | |
| *Carex intumescens* | H | FACW | 10% | | | | |
| *Juncus effusus* | H | FACW | 30% | | | | |
| *Solidago rugosa* | H | FAC | 20% | | | | |
| *Salix discolor* | S | FACW | 5% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: surface inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: surface inches<br>Depth to saturated soil: 0-12 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | O | - | - | - | Organic peat | |
| 4-14 | A | 10yr 2/1 | - | - | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

__Field observation _____

_____

Stream name (if known):

_S31, Unnamed tributary to North Branch Conewango Creek

_____

**Watershed Relationship**

Approximate distance to stream:

_600 feet_____

What watershed is the delineated wetland within?

_NBC46_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, medium-value PEM with moderate vegetative diversity; located in a natural depression between forest and pasture. Receives surface water runoff from adjacent upland areas and drains south via drain D120 to Wetland W121, ultimately reaching stream S31, an unnamed tributary to North Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A Kielaszek | Date: 6/5/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: NBC46-W121<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha angustifolia* | H | OBL | 40% | | | | |
| *Carex sp.* | H | FACW | 20% | | | | |
| *Juncus effusus* | H | FACW | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 12 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: surface inches<br>Depth to saturated soil: 0-4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | - | - | - | Organic peat |
| 2-12 | A | 10yr 2/2 | 10yr 6/2 | 1%, small, faint | Slighly moist silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Observed in the field_____

Stream name (if known):

_S31, Unnamed tributary to North Branch Conewango Creek

_____

Approximate distance to stream:

_225 feet_____

What watershed is the delineated wetland within?

_NBC46_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, high-value PEM wetland, with low vegetative diversity, inundated to 12" in a natural depression in a historic pasture. Receives water via drain D120 and drains southeast to Wetland W31/Stream S31 via drain D121. High groundwater recharge/discharge and amphibian function and value.**

**FEATURE ID : NBC46-S31**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to North Branch Conewango Creek

Date: 05/03/08

State: NY

Observers: A. Francisco, J. Zoladz

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _Small Meanders_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: __NBC 46_____

Stream Flow Direction ____Southeast _____

Width (ft) (water's edge to water's edge) __1-2 feet_____

Width (ft) (bank to bank) _2-4 feet (15 feet at farm road)_

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

_Large flat stone_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : NBC46-S31**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | *Juncus effusus*, various unidentified grasses |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0-20 ft left bank |
| | | | | 5-20 ft right bank |
| | | | | Aquatic Vegetation ☒ Yes ☐ No |
| *Direction when facing downstream: _Southeast_____ | | | | If yes, list: unidentified Algae species, unidentified vascular plants |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W31 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: unidentified fish and tadpoles |
| ☒ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: *Gerris* sp., unidentified frogs |
| Evidence of Pollution? _Yes_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _Yes_____ | | | | If yes, list: |
| Evidence of Erosion? _Yes_____ | | | | Comments: |
| Description of Erosion: _Some cut banks, only minor _____ | | | | |

Comments:

**Small stream with riparian corridor making up wetland W31. Active agricultural fields to the northeast and southwest. Point source pollution coming from drain tile that is draining agricultural field to the southwest. High nutrient load and some litter present. Otherwise stream appears healthy with high floodplain and wildlife value and function. Proposed access road crossing at existing farm road.**

Sector D

Cluster 22

Wetland Datasheets

UD1, W16, W18, W34, W35, W36, W37, W38, W39, W40, W41

Stream Datasheets

S16

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 6/6/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: Upland<br>Transect ID: SVC137-UD1<br>Status: Upland |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW | 5% | | | | |
| *Ranunculus acris* | H | FAC+ | 5% | | | | |
| *Ranunculus fascicularis* | H | FACU | 5% | | | | |
| *Trifolium pratens* | H | FACU- | 75% | | | | |
| *Hierochloe odorata* | H | FACU | 10% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 40%

Remarks:

**Hydrophytic vegetation present?** ☐ Yes ☒ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☐ **Yes** ☒ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 10yr 4/1 | 7.5yr 6/8 | 3% small, distinct | Silty loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☐ **Yes** ☒ **No**

Hydric soils present? ☐ **Yes** ☐ **No**

Wetland hydrology present? ☐ **Yes** ☒ **No**

Is the sampling point within a wetland? ☐ **Yes** ☒ **No**

What is this based on?

__NA_____

Stream name (if known):

____NA_____

Approximate distance to stream:

____NA_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_____SVC137_____

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: ____No flow_____

**Rationale/Remarks:**

**Upland data point taken down gradient from small PEM in an active cow pasture, beyond survey corridor within a broad drainage swale, mapped as Drain D1010. Hydric soils present but hydric vegetation and hydrology are absent.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 4/29/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco & R. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM/PSS |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC138-W16 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 30% | *Solidago gigantea* | H | FACW | 20% |
| *Onoclea sensibilis* | H | FACW | 30% | *Solidago canadensis* | H | FACU | 15% |
| *Phalaris arundinacea* | H | FACW+ | 20% | | | | |
| *Salix discolor* | S | FACW+ | 20% | | | | |
| *Cornus stolonifera* | S | FACW | 20% | | | | |
| *Viburnum recognitum* | S | FACW- | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 2 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-16 | A | 10YR 3/1 | 10yr 4/6 | 1% small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_

Stream name (if known):

_S16, Unnamed tributary to Silver Creek_

Approximate distance to stream:

_Riparian. Stream becomes channelized (minor) near W16-8_

What watershed is the delineated wetland within?

_SVC138_

Comments:

_Also located in SVC137 but ultimately drains to SVC138_

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate to large size and high wildlife and groundwater discharge value PEM/PSS wetland with moderate vegetative diversity, located in a broad natural swale. Receives water via surface runoff and groundwater discharge from south end. Wetland extends south (up-gradient) and north beyond survey corridor via stream S16, which ultimately reaches an unnamed tributary to Silver Creek. Portion of wetland in vicinity of Access road crossing is impacted by historic machinery ruts (P92, P93).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & R. Dutton | Date: 4/29/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC137-W18<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 30% | | | | |
| *Phalaris arundinacea* | H | FACW | 40% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Multiple historic machinery ruts that hold water. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10yr 3/2 | 5yr 5/8 | 1% small, distinct | Moist silt loam | |
| 4-14 | B | 10yr 5/4 | 10yr 6/8 | 10% large, distinct | Slightly moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

500 feet

What watershed is the delineated wetland within?

SVC137

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM, with little vegetative diversity, located within a natural swale and cow pasture. Receives surface water runoff. Wetland drains west via overland flow to Drain D1004, ultimately reaching an unnamed tributary of Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Zoladz | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC140-W34<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Caltha palustris* | H | OBL | 10 | | | | |
| *Veratrum viride* | H | FACW+ | 15 | | | | |
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 15 | | | | |
| *Tsuga canadensis* | T | FACU | 20 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches<br>Depth to free water in pit: 8 inches<br>Depth to saturated soil: 8 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**
Taxonomy (subgroup) **Aquic Dystrochrepts**

Drainage Class **Moderately well drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/2 | - | - | Saturated silt loam | |
| 8-15 | B | 5Y 5/2 | 7.5YR 4/6 | 30% large, distinct | Slightly moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
_Field observation and desktop review_____
_____

Stream name (if known):
_S22, Unnamed tributary to Silver Creek_____

Approximate distance to stream:
_1000 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?
_SVC140_____

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:
_____
_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Mapped portion of wetland W34 is a Moderate size and value PFO ¼ on a southeast sloping hillside typified by pit and mound topography. Receives surface water runoff from surrounding up-gradient areas and drains to the southeast beyond the survey corridor via wetland W34. Moderate groundwater recharge and discharge function and value. No amphibians noted within mapped portion.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Zoladz | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC140-W35<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Osmunda cinnamomea* | H | FACW | 20 | | | | |
| *Betula alleghaniensis* | T | FAC | 10 | | | | |
| *Acer rubrum* | T | FAC | 10 | | | | |
| *Tsuga canadensis* | T | FACU | 50 | | | | |
| *Acer saccharum* | T | FACU- | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☒<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-10 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Buttressed tree trunks, and pit & mound topography | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | 0 | - | - | - | Saturated H2 Peat |
| 6-9 | A | 10YR 5/2 | - | - | Saturated silty clay |
| 9-12 | B | 7.5YR 4/1 | 7.5YR 5/8 | 2%, small, distinct | Moist clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation and desktop review

Stream name (if known):

S22, Unnamed tributary to Silver Creek

Approximate distance to stream:

1000 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC140

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value hilltop PFO ¼ typified by pit and mound topography. Moderate vegetative diversity. Receives surface water runoff from up-gradient areas. Drains predominantly west. Wetland continues west beyond the survey corridor. The northeast portion of the wetland drains to the northeast via discrete overland flow to wetland W34. High groundwater recharge and discharge function and value as well as amphibian habitat function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC140-W36<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Equisetum arvense* | H | FAC | 25 | | | | |
| *Veratrum viride* | H | FACW+ | 15 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Glyceria striata* | H | OBL | 10 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/2 | - | - | Saturated silt loam | |
| 4-14 | B | 10YR 2/1 | 2.5YR 3/6 | 20% large, distinct | Very moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and destop analysis_____

_____

Stream name (if known):

_Stream S22, Unnamed tributary to Silver Creek__

Approximate distance to stream:

_940 feet_____

What watershed is the delineated wetland within?

_SVC140_____

Comments:

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Wetland W36 is a small PFO located on a northeast slightly-sloping hillside typified by pit and mound topography. The wetland extends further northeast beyond the survey corridor. Inflow via surface runoff from up-gradient areas. Outflow northeast beyond the survey corridor presumably to unnamed tributary to Silver Creek (S22). Moderate groundwater recharge and discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC140-W37<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Solidago gigantea* | H | FACW | 25 | | | | |
| *Ranunculus repens* | H | FAC | 20 | | | | |
| *Veratrum viride* | H | FACW+ | 5 | | | | |
| *Caltha palustris* | H | OBL | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 7 inches<br>Depth to saturated soil: 7 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Alden mucky silt loam**
Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/2 | 10YR 4/8<br>10YR 5/4 | 2% small, distinct<br>5% large, distinct | Very moist silty loam | |
| 8-14 | B | 10YR 3/4 | - | - | Moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field Observation

Stream name (if known):
_Stream S22, Unnamed tributary to Silver Creek__

Approximate distance to stream:
_1060 feet

What watershed is the delineated wetland within?
_SVC140

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small PEM at forest edge. Receives surface runoff from surrounding up-gradient areas and from south from wetland W38 and drain D38. Wetland W37 drains northeast past cut in bank of pond PO1000. Pond PO1000 drains into north end of wetland W37 during heavy rain events (Pond PO1000 also drains north via cut in pond bank) into wetland W38. All features presumably drain to an unnamed tributary to Silver Creek (stream S22) based on topography. Moderate groundwater recharge and discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC140-W38<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex* sp. | H | >FAC | 25 | *Tsuga canadensis* | T | FACU | 10 |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Glyceria striata* | H | OBL | 15 | | | | |
| *Veratrum viride* | H | FACW+ | 10 | | | | |
| *Acer rubrum* | T | FAC | 10 | | | | |
| *Betula alleghaniensis* | T | FAC | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 6-8 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | - | - | - | H4 Saturated Peat |
| 2-14 | A | 2.5YR 3/1 | 2.5YR 3/4 | 20%, large, distinct | Moist silty clay loam |
| 14-16+ | B | 10YR 4/1 | 5Y 5/6 | 20%, large, distinct | Moist silty clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_____

_____

Stream name (if known):

_Stream S22, Unnamed tributary to Silver Creek__

Approximate distance to stream:

_1060 feet_____

What watershed is the delineated wetland within?

_SVC140_____

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small to moderate size and value hilltop PFO ¼ with moderate vegetative diversity typified by pit and mound topography. Receives surface water runoff from upland areas and drains primarily to the north via drain D38 into wetland W37, and ultimately to unnamed tributary to Silver Creek (S22). A small amount may drain to the south to an unmapped portion of wetland W35 beyond the survey corridor. Moderate groundwater discharge and recharge function and value. Appears to have a high amphibian habitat value although none were observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park | Date: 05/05/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco, A. Kielaszek | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC140-W39 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Phalaris arundinacea* | H | FACW | 20 | | | | |
| *Solidago gigantea* | H | FACW | 10 | | | | |
| *Ulmus americana* | T | FACW- | 1 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/1 | 5YR 5/8 | 5%, small, distinct | Saturated silt loam with 50% partly decomposed organic matter |
| 8-16+ | B | 10YR 2/2 | 2.5Y 4/8 | 3%, small, distinct | Slightly moist sandy clay loam with oxidized rhizospheres |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_____

_____

Stream name (if known):

_ Unnamed tributary to Silver Creek__

Approximate distance to stream:

_1060 feet_____

What watershed is the delineated wetland within?

_SVC140_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, moderate value PEM wetland with low vegetative diversity; associated with a natural depression in a field adjacent to a forested area. Receives surface water runoff from surrounding up-gradient areas and drains to the northeast via drain D39 and ultimately to unnamed tributary to Silver Creek . Wetland also continues northwest beyond the survey corridor at wetland flag W39-7**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC138-W40<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Phalaris arundinacea* | H | FACW | 10 | | | | |
| *Solidago gigantea* | H | FACW | 10 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 7 inches<br>Depth to saturated soil: 7 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | A | 10YR 2/1 | - | | Saturated silt loam with 40% partly decomposed organic matter |
| 3-14+ | B | 10YR 3/2 | 2.5YR 5/8 | 15%, small, distinct | Moist clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation and desktop review_

Stream name (if known):

_Stream S16, Unnamed tributary to Silver Creek__

Approximate distance to stream:

_1000 feet_

**Watershed Relationship**

What watershed is the delineated wetland within?

_SVC138_

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_S16 drains from SVC 138 to SVC137_

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PEM, with low vegetative diversity. Receives water via drain D40 that is an effluent drain from northwest corner of pond PO1000. Wetland extends beyond the survey corridor ultimately reaching stream S16 via discrete overland flow. Moderate groundwater recharge and discharge function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 05/05/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC138-W41<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 25 | | | | |
| *Carex sp.* | H | ≥FAC | 25 | | | | |
| *Phalaris arundinacea* | H | FACW | 20 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ ~70% | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 3-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Inundated natural depression, data point outside indundated area. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/2 | 5YR 5/8 | 5%, small, distinct | Saturated silt loam |
| 4-14+ | B | 10YR 4/2 | 7.5YR 6/8 | 5%, large, distinct | Moist clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation

Stream name (if known):

_Stream S16, Unnamed tributary to Silver Creek

Approximate distance to stream:

_1000 feet

What watershed is the delineated wetland within?

_SVC138

Comments:

_Stream S16 drains to SVC 137

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _Goes to groundwater.

**Rationale/Remarks:**

**Small isolated PEM associated with a natural depression in an active cow pasture. Receives surface water runoff via drain D41 from adjacent upland areas. It drains northeast via overland flow beyond the wetland boundary and reverts back to groundwater. No surface connection to Traditionally Navigable Waters. Moderate groundwater recharge/discharge function and value as well as amphibian habitat function and value (although no amphibians were observed).**

**FEATURE ID : SVC138-S16_____**

**STREAM DATA SHEET**

| | |
|---|---|
| County: Chautauqua | Stream Name: Unnamed tributary to Silver Creek |
| Date: 4/29/08 | State: NY |
| Observers: A. Francisco, B. Dutton | |

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____See below_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _SVC 38_____

Stream Flow Direction __North_____

Width (ft) (water's edge to water's edge) ___2'_____

Width (ft) (bank to bank) _____4'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC138-S16_____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | *Juncus effusus, Glyceria striata* |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 1 ft left bank<br>1 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _North_____ | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W16 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☒ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _____No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? __No_____ | | | | If yes, list: |
| Evidence of Erosion? _____minor_____ | | | | Comments: |
| Description of Erosion: ____minor down-cutting_____ | | | | |

Comments:
**Small S-RPW draining north from Wetland W16 (channelization starts near W16-18) to an unnamed tributary of Silver Creek**

Sector D

Cluster 23

Wetland Datasheets
W1, W2, W3, W4, W5, W6, W7, W8, W124

Stream Datasheets

S7, S1000, S1002

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC131-W1<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 40% | | | | |
| *Ranunculus repens* | H | FAC | 20% | | | | |
| *Onoclea sensibilis* | H | FACW | 10% | | | | |
| *Rubus hispidus* | H | FACW | 10% | | | | |
| *Solidago* sp. | H | FAC | 5% | | | | |
| *Cornus stolonifera* | S | FACW+ | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 8 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depression area, within tire ruts. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10yr 2/2 | 2.5yr 4/8 | 3%, small, distinct | Very moist silt loam | |
| 8-14+ | A | 10yr 5/8 | 2.5yr 4/8 | 3%, small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and Desktop review_____

Stream name (if known):

_Unnamed tributary to East Mud Lake/Silver Creek_____

Approximate distance to stream:

_1500 feet_____

What watershed is the delineated wetland within?

_SVC131_____

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value emergent linear feature associated with drainage swale between cow pasture and forested area. Receives discrete surface runoff from west and drains east/ north to an unnamed tributary of Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 4/21/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco, A. Marciano | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM/PFO |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC131-W2 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 10 | *Fraxinus pennsylvanica* | T | FACW | 2 |
| *Ranunculus repens* | H | FAC | 10 | *Erythronium rostratum* | H | UPL | 2 |
| *Veratrum viride* | H | OBL | 10 | | | | |
| *Juncus effusus* | H | FACW+ | 10 | | | | |
| *Acer rubrum* | T | FAC | 5 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): Depression area, within tire ruts. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-7 | A | 10yr 3/1 | 5yr 4/6 | 2%, small, distinct | Moist silt loam | |
| 7-15+ | B | 10yr 5/3 | 5yr 5/8 | 5%, small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_Unnamed tributary to Silver Creek/East Mud Lake_____

Approximate distance to stream:

_1200 feet_____

What watershed is the delineated wetland within?

_SVC131_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, moderate-value PFO that drains northeast from hilltop into reverting agricultural field PEM component. Typified by pit and mound topography. Additional overland sheet flow runoff provided by drains D2a through D2C, which drain north and east into PEM agricultural field. PEM portion drains northeast beyond survey corridor into Drain D3 and Wetland W3, ultimately reaching an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 4/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC131-W3<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 80% | | | | |
| *Juncus effusus* | H | FAC | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area, within tire ruts. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 2.5yr 3/1 | 10yr 4/6 | Médium size | Silt loam | |
| 6-14+ | B | 10yr 2/1 | 10yr 5/6 | Few, médium size, strong contrast | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_Unnamed tributary to Silver Creek/East Mud Lake_____

Approximate distance to stream:

_1000 feet _____

What watershed is the delineated wetland within?

_SVC131_____

Comments:

_____

_____

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Medium sized and moderate value PEM wetland with low vegetative diversity, located in a broad swale of reverting field. Receives water from surface runoff and groundwater discharge. Drains southeast via Drain D3 beyond survey corridor to unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Rupp | Date: 04/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM / PFO<br>Transect ID: SVC129-W4<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 5 | *Malus sp*. | T | UPL | 10 |
| *Onoclea sensibilis* | H | FACW | 45 | *Fraxinus pennsylvanica* | T | FACW | 5 |
| *Solidago sp*. | H | >FAC | 45 | | | | |
| *Rubus hispidus* | H | FACW | 5 | | | | |
| *Acer rubrum* | T | FAC | 5 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: ~6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Taxonomy (subgroup) **Aquic Dystrochrepts**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9 | A | 10YR 2/1 | 2.5YR 4/4 | 5%, small, faint | very moist silt loam | |
| 9-14+ | B | 10YR 6/4 | 10YR 5/6 | 10%, large, distinct | Slightly moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

**S1001 is S-RPW in survey corridor, but P-RPW downstream.**

What is this based on?

_Field observation and desktop analysis_____

Stream name (if known):

_S1001, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

_900 feet_____

What watershed is the delineated wetland within?

_ SVC129_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, low value PFO/PEM wetland located within a cow pasture and adjacent to forested area. Wetland has pit & mound topography throughout forested portion W4-10 (P26) to W4-23 and PEM portion W4-1 to W4-10 and W23 to W4-41 (historic cow pasture) (P21, P22, P24). Wetland receives surface runoff from drain D4 near W4-7 and D4A near W4-9, and from groundwater seeps. Drains north via Drain 1001 near W4-30 and drains NE from Drain D4C east of W4-33. Wetland drains via D4b ultimately to unnamed tributary of Silver Creek (S1001).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Rupp | Date: 04/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC129-W5<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 40 | | | | |
| *Erythronium americanum* | H | FACU | 25 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Ulmus americana* | T | FACW- | 15 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 20 | | | | |
| *Ostrya virginiana* | T | FACU- | <5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 67%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | O | - | - | - | H5 Peat, Saturated |
| 4-9 | A | 10YR 2/1 | - | - | Saturated silt loam |
| 9-15+ | B | 10YR 4/2 | 10YR 5/8 | 10%, large, distinct | Slightly moist silt loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation and desktop analysis_

Stream name (if known):

_S1001, (Unnamed tributary to Silver Creek)_

Approximate distance to stream:

_750 feet_

**Watershed Relationship**

What watershed is the delineated wetland within?

_SVC129_

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

**S1001 is S-RPW in survey corridor, but P-RPW downstream.**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate to large PFO, with moderate groundwater recharge and discharge value. Wetland has moderate vegetative diversity and wildlife habitat value. Wetland is typified with pit & mound topography. Inflow via surface runoff from southwest and outflow northeast via D5 to D1001 (effluent draw from W4-30). Ultimately reaching unnamed tributary to Silver Creek (S1001).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Rupp | Date: 04/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC133-W6<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | *Veratrum viride* | H | FACW+ | 15 |
| *Equisetum arvense* | H | FAC | <5 | *Betula alleghaniensis* | T | FAC | <5 |
| *Erythronium americanum* | H | FACU | 30 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |
| *Ulmus americana* | T | FACW- | 10 | | | | |
| *Acer rubrum* | T | FAC | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | - | - | - | H5 Peat, Saturated |
| 2-8 | A | 10YR 3/1 | - | - | Saturated silt loam |
| 8-15+ | B | 10YR 5/4 | 10YR 5/8 | 10%, large, distinct | Moist silt loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation_____

_____

Stream name (if known):

_Unnamed tributary to Silver Creek (S1000)_____

Approximate distance to stream:

_200 feet_____

What watershed is the delineated wetland within?

_SVC133_____

Comments:

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PFO, with moderate vegetative diversity, typified with pit & mound topography located on slight northeast-sloping hill. Moderate groundwater recharge and discharge value. Receives inflow via surface water runoff and drains east to Stream 1002 via drain D6 at W6-25, ultimately reaching an unnamed tributary of Silver Creek (S1000).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Rupp | Date: 04/24/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC136-W7<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 10 | *Caltha palustris* | H | OBL | 2 |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Erythronium americanum* | H | FACU | 40 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 5 | | | | |
| *Acer rubrum* | T | FAC | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/1 | - | - | Saturated silty clay loam |
| 4-14+ | B | 10YR 5/2 | 10YR 4/6 | 10%, large, distinct | Slightly moist Sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is ☒ **Abutting**
☐ **Adjacent with surface connection**
☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☒ **Non-RPW**

What is this based on?

_Field observation _____

Stream name (if known):

_Unnamed tributary to Silver Creek (S7)_____

Approximate distance to stream:

_Riparian_____

What watershed is the delineated wetland within?

_ SVC136_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PFO, with moderate vegetative diversity, typified by pit and mound topography. Receives surface water runoff and abuts Stream S7 (SVC136) beyond (to the north-northwest of) the survey corridor. Moderate wildlife habitat and groundwater recharge and discharge value. Stream S7 flows north to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Rupp | Date: 04/24/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC133-W8<br>Status: Isolated, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 30 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Erythronium americanum* | H | FACU | 40 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 40 | | | | |
| *Ulmus americana* | T | FACW- | 10 | | | | |
| *Acer rubrum* | T | FAC | 40 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 0-2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

## SOILS

Map Unit Name (Series and Phase) **: Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | A | 10YR 2/2 | - | - | Very moist sily loam, with 50% partially decomposed organic matter |
| 4-14+ | B | 2.5YR 5/3 | 5YR 4/6 | 10%, large, distinct | Very fine sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
_Field observation

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Stream name (if known):
_S1000, (Unnamed tributary to Silver Creek)

Approximate distance to stream:
_1000 feet

What watershed is the delineated wetland within?
_SVC133

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: _No surface flow

**Rationale/Remarks:**

**Moderate size, moderate-value PFO with moderate vegetative diversity typified by pit and mound topography near top of northeast sloping hillside. Moderate groundwater recharge and discharge value as well as moderate wildlife habitat value. The wetland receives surface runoff from surrounding upgradient areas with no apparent surface connection to Traditionally Navigable Waters. No drainage features identified. Surface water reverts to groundwater beyond wetland boundary.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A Kielaszek | Date: 6/5/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: SVC129-W124<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15% | *Osmunda cinnamomea* | H | FACW | 10% |
| *Acer rubrum* | T/S | FACW+ | 15% | *Betula alleghaniensis* | T | FAC | 5% |
| *Impatiens capensis* | H | FACW | 10% | | | | |
| *Glyceria striata* | H | OBL | 20% | | | | |
| *Veratrum viride* | H | FACW+ | 20% | | | | |
| *Fagus grandifolia* | T | FAC+ | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: na inches<br>Depth to saturated soil: surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10yr 2/1 | - | - | Saturated silt loam | |
| 7-12+ | B | 10yr 6/1 | 2.5yr 6/8 | 5% small distinct | Moist siltly clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation/Desktop analysis_____

Stream name (if known):

_Unnamed tributary to Silver Creek (S1001)

_____

Approximate distance to stream:

_1000 feet_____

What watershed is the delineated wetland within?

_SVC129_____

Comments:

_____

_____

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

**S1001 is intermittent within the survey corridor, but determined to be perennial downstream.**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Small, low value PEM/PFO wetland, with low vegetative diversity, formed along an inundated and saturated old logging road crossing upland forest. Receives water via overland sheet flow and possible groundwater seepage. Outlet via down-gradient groundwater reversion and overland flow. Drains to Wetland W5 to the north outside the survey corridor, and ultimately to an unnamed tributary to Silver Creek (S1001). Some groundwater recharge/discharge function and value.**

**FEATURE ID : SVC136-S7**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 04/24/08

State: NY

Observers: A. Francisco, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☐ Non-RPW ☒

Perennial ☐ Intermittent ☐
Ephemeral ☒

Geometry: Meanders ☐ Rel. Straight ☒

Description: Starts from groundwater seep

Tributary is: Natural ☒ Manipulated ☐

Watershed: _SVC136_____

Stream Flow Direction _North_____

Width (ft) (water's edge to water's edge) ____1_____

Width (ft) (bank to bank) ____12-16 inches_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:

- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC136-S7**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _North_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☒ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_____
Presence of Riffle/Run/Pools? _No_____
Evidence of Erosion? _Little_____
Description of Erosion: _____

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No
If yes, list: Veratrum viride, Ranunculus abortivus, Equisetum arvense, Fraxinus pennsylvanica
Approximate Riparian Width (facing d.s.) ft left bank
ft right bank
Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☒ Yes ☐ No
If yes, list: W7

Aquatic Organisms ☐ Yes ☒ No
If yes, list:

Riparian/Terrestrial Organisms ☒ Yes ☐ No
If yes, list: Frogs

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

Comments:
Stream S7, a small ephemeral stream, beyond survey corridor. Wetland W7 drains north northwest to stream S7.

**FEATURE ID : SVC133-S1000_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 4/21/08

State: NY

Observers: A.Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ____Silver Creek 133_____

Stream Flow Direction _____East_____

Width (ft) (water's edge to water's edge) ____4-5_____

Width (ft) (bank to bank) _____6-8_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC133-S1000_____**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _East_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☒ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_____
Presence of Riffle/Run/Pools? _Yes, small ones____
Evidence of Erosion? _Yes_____
Description of Erosion: _Minor Bank Cuts_____
Comments:

Perennial stream, an unnamed tributary to Silver Creek.

## Associated Habitat

Riparian Vegetation ☐ Yes ☒ No
If yes, list:

Approximate Riparian Width (facing d.s.) ft left bank
ft right bank

Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☐ Yes ☒ No
If yes, list:

Aquatic Organisms ☒ Yes ☐ No
If yes, list: Water Striders

Riparian/Terrestrial Organisms ☐ Yes ☒ No
If yes, list:

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

**FEATURE ID : SVC133-S1002**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 04/23/08

State: NY

Observers: A. Francisco, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: Drains East across shallow forested swale

Tributary is: Natural ☒ Manipulated ☐

Watershed: _SVC133_____

Stream Flow Direction _East_____

Width (ft) (water's edge to water's edge) ____1-2_____

Width (ft) (bank to bank) ____12-15_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:

- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC133-S1002**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _East_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☐ | 0 -20% (0-11°) | ☐ |
| ☒ | 21 – 50% (12-27°) | ☒ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _None_____
Presence of Riffle/Run/Pools? _No_____
Evidence of Erosion? _Little_____
Description of Erosion: _____
Comments:
Small, perennial stream, flows east at Access Road 21.

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No
If yes, list: *Trillium sp.*

Approximate Riparian Width (facing d.s.) n/a ft left bank
12 ft right bank

Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☐ Yes ☒ No
If yes, list:

Aquatic Organisms ☐ Yes ☒ No
If yes, list:

Riparian/Terrestrial Organisms ☐ Yes ☒ No
If yes, list:

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

Sector D

Collection Line

Wetland Datasheets

W9, W10, W11, W12, W13, W14, W15, W17, W19, W20, W21, W22, W22a, W23, W24, W25, W26, W27, W33, W49, W122, W123

Stream Datasheets

S9, S22, S123, S551, S1001, S1001A

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Rupp | Date: 04/24/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM Riparian<br>Transect ID: NBC39-W9<br>Status: Jurisdictional, see remarks below |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | <5 | | | | |
| *Malva neglecta* | H | UPL | 10 | | | | |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Acer rubrum* | S | FAC | 10 | | | | |
| *Caltha palustris* | H | OBL | 10 | | | | |
| *Glyceria striata* | H | OBL | 40 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐<br>Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Water Marks: ☐<br>Drift Lines: ☐ | Sediment Deposits: ☒<br>Drainage Patterns: ☒ |
| Depth of inundation: inches<br>Depth to free water in pit: 8 inches<br>Depth to saturated soil: 10 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/1 | - | - | Moist silt loam |
| 8-15+ | B | 10YR 3/2 | 5YR 4/6 | 15%, large, distinct | Very moist silt loam, with small sand lenses |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation _____

Stream name (if known):

_Stream S9 (Unnamed tributary to North Branch Conewango Creek)_____

Approximate distance to stream:

_Abutting_____

What watershed is the delineated wetland within?

_ NBC 39_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☒ **confined** ☐ **overland sheet flow**

☒ **other**

Explain: __Riparian_____

**Rationale/Remarks:**

**Moderate size and value riparian PEM, with moderate vegetative diversity. Wetland located within the banks of stream S9, which flows east. High groundwater recharge/ discharge value and flood-flow alteration value. Stream S9 ultimately reaches North Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC136-W10<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | *Tsuga canadensis* | T | FAC | 10 |
| *Erythronium americanum* | H | FACU | 30 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 20 | | | | |
| *Spiraea latifolia* | S | FAC+ | <5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | 0 | - | - | - | Very moist silt loam with 50% partially decomposed organic matter |
| 3-6 | A | 10YR 3/1 | 10YR 4/6 | 3%, large, distinct | Saturated silt loam |
| 6-14+ | B | 10YR 5/2 | 10YR 5/6 | 50%, large, distinct | Slightly moist, sandy clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field Observation_____

Stream name (if known):

_S7, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

_600 feet _____

**Watershed Relationship**

What watershed is the delineated wetland within?

_SVC136_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☐ **P-RPW**
- ☐ **S-RPW**
- ☒ **Non-RPW**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PFO 1/4, typified by pit and mound topography, located within a historic inundated logging road. Wetland is assumed to be adjacent with surface connection based on landscape position and proximity to mapped wet area.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC136-W11<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Caltha palustris* | H | OBL | 5 | *Malva neglecta* | H | UPL | 5 |
| *Veratrum viride* | H | FACW+ | 15 | *Ulmus americana* | T | FACW- | <5 |
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Betula alleghaniensis* | T | FAC | 5 | | | | |
| *Erythronium americanum* | H | FACU | 30 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation:<br>inches | Oxidized Root (live roots)<br>Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | 0 | - | - | - | H5 Peat |
| 4-7 | A | - | - | - | Saturated silt loam |
| 7-14+ | B | 7.5YR 5/1 | 7.5YR 5/6 | 30%, large, distinct | Moist clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation_

Stream name (if known):

_S7, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

600 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC136 and NBC39

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Wetland drains through SVC136

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☒ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _Presumed based on topography

**Rationale/Remarks:**

**Moderate to large PFO that spans the survey corridor. High groundwater recharge and discharge function and value and high wildlife habitat function and value. Northern portion of wetland is associated with SVC136 watershed and southern portion of wetland is associated with NBC39 watershed near a non-delineated portion of Stream S9. Wetland receives surface water runoff and groundwater seepage which appears to drain North-northeast to SVC136.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC136-W12<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Ulmus americana* | T | FACW- | 5 | | | | |
| *Acer rubrum* | T | FAC | 3 | | | | |
| *Glyceria striata* | H | OBL | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-1 | 0 | - | - | - | Layer of organic | |
| 1-4 | A | 7.5YR 3/1 | 7.5YR 5/4 | 1%, small, faint | Silt loam | |
| 4-12 | B | 10YR 6/1 | 10YR 5/6 | 50%, large, distinct | Sandy loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation and desktop review_____

Stream name (if known):

_S7, Unnamed tributary to Silver Creek_____

Approximate distance to stream:

_850 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_ SVC136_____

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☒ **Non-RPW**

Flow relationship to associated stream:

☐ **intermittent surface** ☐ **ephemeral surface**
☐ **perennial surface** ☒ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, isolated wetland with low value and low vegetative diversity, associated with natural depressions that collect surface runoff. No outflow observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 04/25/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC136-W13<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10 | *Tsuga canadensis* | T | FAC | 5 |
| *Veratrum viride* | H | FACW+ | 20 | *Ulmus americana* | T | FACW- | 10 |
| *Malva neglecta* | H | UPL | 20 | *Acer rubrum* | T | FAC | 30 |
| *Equisetum arvense* | H | FAC | 10 | *Fraxinus pennsylvanica* | T | FACW | 10 |
| *Caltha palustris* | H | OBL | 10 | | | | |
| *Erythronium americanum* | H | FACU | 30 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 89%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation:<br>inches | Oxidized Root (live roots)<br>Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 10 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-1 | 0 | - | - | - | Very moist sily loam, with 50% partially decomposed organic matter |
| 1-4 | A | 7.5YR 2.5/1 | 7.5YR 4/6 | 3%, small, faint | Moist clay loam |
| 3-14+ | B | 2.5YR 6/2 | 7.5YR 5/6 | 10%, moderate, distinct | Slightly moist sandy clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Desktop analysis_____

Stream name (if known):

_S22, Unnamed tributary to Silver Creek_____

Approximate distance to stream:

_850 feet_____

What watershed is the delineated wetland within?

_ SVC136, NBC39, SVC142, and SVC140_____

Comments:

_Although wetland crosses several watersheds, flow presumed to reach S22 outside of the survey corridor based on desktop analysis._____

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, high value PFO ¼, with high vegetative diversity, typified by pit and mound topography and impacted by historic logging roads in multiple areas including area to be crossed by Access Road 21 near wetland flag W13-16. Eastern portion of delineated wetland is associated with non-delineated portion of stream S9. The western portion contains a vernal pool (inundated portion of logging road (P68)) and more logging road impacts that drain north beyond the survey corridor ultimately to unnamed tributary to Silver Creek (S22).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 4/26/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco & R. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PFO |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC140-W14 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 5% | | | | |
| *Rubus hispidus* | S | FACW | 40% | | | | |
| *Erythronium americanum* | H | FACU | 20% | | | | |
| *Onoclea sensibilis* | H | FACW | <5% | | | | |
| *Acer rubrum* | T | FAC | 30% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 6" inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10YR 3/1 | --- | --- | Very moist silty loam | |
| 6-14 | B | 2.5Y 2.5/1 | 7.5YR 4/6 | 2% small distinct | Very moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation and desktop review

Stream name (if known):

S22, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

450 feet

What watershed is the delineated wetland within?

SVC140

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PFO, with moderate vegetative diversity, located near top of slight hill. Wetland topography is pit and mound and has been heavily impacted by logging (clearing and roads). Receives surface water runoff and drains north via drain D14 into wetland W15 and ultimately to unnamed tributary to Silver Creek (S22). Moderate groundwater recharge and wildlife (turkey) values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Kielaszek | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC142-W15<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 15 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Solidago gigantea* | H | FACW | 10 | | | | |
| *Acer rubrum* | T | FAC | 15 | | | | |
| *Ulmus americana* | T | FACW- | 10 | | | | |
| *Tsuga canadensis* | T | FACU | 30 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/2 | - | - | Saturated silt loam with 40% partially decomposed organic matter |
| 4-13 | B | 2.5Y 5/2 | 5YR 5/8 | 15%, moderate, distinct | Moist sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
Observation and desktop review

Stream name (if known):
S22, Unnamed tributary to Silver Creek

Approximate distance to stream:
400 feet

**Watershed Relationship**

What watershed is the delineated wetland within?
SVC142 and SVC140

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:
Both watersheds drain to S22

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PFO ¼ near top of slightly northeast sloping hillside. Moderate vegetative diversity and wildlife habitat function and value. High groundwater recharge/discharge function and value. Receives surface runoff via rutted logging roads (W15-1 to W15-3 and W15-100 to W15-103). Wetland extends northeast beyond survey corridor and may connect to Wetland W13. Ultimately drains to an unnamed tributary to Silver Creek (S22).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 4/29/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco & R. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PSS |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC138-W17 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20% | *Solidago gigantea* | H | FACW | 10% |
| *Salix* sp. 1 | S | FACW | 40% | *Phalaris arundinacea* | H | FACW+ | 15% |
| *Salix* sp. 2 | S | FACW | 40% | | | | |
| *Rubus hispidus* | H | FACW | 40% | | | | |
| *Ranunculus repens* | H | FACW | 30% | | | | |
| *Erythronium americanum* | H | FACU | 25% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 7 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 7.5 yr 2/1 | 7.5yr 5/6 | 1% small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation and desktop review_

Stream name (if known):

_Unnamed tributary to Silver Creek_

Approximate distance to stream:

_700 feet _

What watershed is the delineated wetland within?

_SVC138_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size PSS with high wildlife and groundwater recharge/discharge value, with moderate vegetative diversity, located on slight north and northeast sloping hillside. Wetland severely impacted by historic machinery ruts which tranverse hillside (east to west) and hold precipitation. Receives water via up-gradient surface runoff from the south. Wetland drains north via Drains D17 and D17a beyond wetland boundary where drains revert to discrete overland flow, presumably to watershed SVC138. Numerous micro-drainages observed between vegetation on hillside northeast of wetland.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & R. Dutton | Date: 4/29/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC140-W19<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 30% | | | | |
| *Carex sp.* | H | FACW | 40% | | | | |
| *Glyceria striata* | H | OBL | 30% | | | | |
| *Salix sp.* | H | FACW | 5% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 7 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10yr 2/2 | 10yr 5/8 | 5%, large, distinct | Very Moist silt loam | |
| 5-14 | B | 10yr 2/3 | 7.5yr 5/8 | 3% small, distinct | Slightly moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions FEW
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation and desktop review

Stream name (if known):
S22, (Unnamed tributary to Silver Creek)

Approximate distance to stream:
200 feet

What watershed is the delineated wetland within?
SVC140

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM with little vegetative diversity, associated with periodically inundated logging road (P106). Receives storm water runoff and drains east via Drain D19 to adjacent large wetland complex beyond survey corridor which presumably drains northeast to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Marciano | Date: 4/30/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: SVC136-W20<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | OBL | 30% | *Fraxinus pennsylvanica* | T | FACW | 15% |
| *Veratrum viride* | H | OBL | 30% | | | | |
| *Equisetum arvense* | H | FAC | <5 | | | | |
| *Solidago gigantea* | H | FACW | 30% | | | | |
| *Ulmus americana* | T | FACW- | 15% | | | | |
| *Acer rubrum* | T | FACW+ | 20% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-3 | O | - | - | - | Saturated, H3 peat | |
| 3-8 | A | 10yr 3/1 | 7.5yr 5/8 | 3% small, distinct | Saturated silt loam | |
| 8-14+ | B | 10yr 6/1 | 7.5 yr 5/8 | 5%, large, distinct | Slightly moist sandy clay | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions FEW
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

**SVC136 watershed eventually drains to S1001.**

What is this based on?

_Field observation and desktop review_

Stream name (if known):

_S1001, Unnamed tributary to Silver Creek_

Approximate distance to stream:

_800 feet_

What watershed is the delineated wetland within?

_SVC136_

Comments:

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size PEM/PFO with moderate vegetative diversity. Moderate groundwater recharge/discharge and wildlife values. Receives inflow via groundwater discharge and surface runoff. Outflow via drain D20 in old machinery ruts, reverting to discrete overland flow at D20-5, and ultimately draining to S1001.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Marciano | Date: 4/30/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC140-W21<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20% | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 5% | | | | |
| *Ulmus americana* | T | FACW- | 5% | | | | |
| *Glyceria striata* | H | OBL | 50% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | - | - | - | Saturated, H3 peat |
| 2-6 | A | 10yr 2/2 | - | - | Saturated silt loam |
| 6-14+ | B | 10yr 4/2 | 7.5 yr 5/8 | 3%, small, distinct | Slightly moist sandy clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions FEW
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
_Field observation and desktop review_

Stream name (if known):
_S22, (Unnamed tributary to Silver Creek)

Approximate distance to stream:
_200 feet_

**Watershed Relationship**

What watershed is the delineated wetland within?
_SVC140

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PEM with low vegetative diversity, located in natural depression in an upland forested area (approximately 10% elm and ash) with pit and mound topography. Wetland begins southwest beyond survey corridor and drains via Drain D21 into an inundated logging road associated with Wetland W19, ultimately reaching an unnamed tributary to Silver Creek (S22).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Marciano | Date: 4/30/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC140-W22<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30% | *Fraxinus pennsylvanica* | T | FACW | 10% |
| *Rubus hispidus* | H | FACW | 10% | *Ulmus americana* | T | FACW- | 15% |
| *Veratrum viride* | H | FACW+ | 10% | | | | |
| *Erythronium americanum* | H | FACU | 5% | | | | |
| *Salix* sp. | S | FACW | 10% | | | | |
| *Acer rubrum* | T | FACW- | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10yr 2/1 | 5yr 5/8 | 2% small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field observation

Stream name (if known):
_S22, Unnamed tributary to Silver Creek

Approximate distance to stream:
_Riparian

What watershed is the delineated wetland within?
_SVC140

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: __Riparian wetland

**Rationale/Remarks:**

**Moderate size and value PFO riparian wetland, with high vegetative diversity, located with in the banks of stream S22. Wetland drains northeast via stream S22 into larger wetland complex outside survey corridor, ultimately reaching Silver Creek. High groundwater recharge/discharge and wildlife habitat.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A Kielaszek | Date: 6/5/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC140-W22a<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 5% | *Osmunda cinnamomea* | H | FACW | 10% |
| *Acer saccharum* | T | FACU- | 5% | *Laportea canadensis* | H | FACW | 10% |
| *Impatiens capensis* | H | FACW | 15% | *Caltha palustris* | H | OBL | 10% |
| *Glyceria striata* | H | OBL | 15% | | | | |
| *Veratrum viride* | H | FACW+ | 5% | | | | |
| *Carex sp*. | H | OBL | 20% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 89%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: na inches<br>Depth to saturated soil: surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 10yr 3/1 | - | - | Moist sandy loam, many roots throughout | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☒ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_____

Stream name (if known):

_S22, Unnamed tributary to Silver Creek

_____

Approximate distance to stream:

Riparian_____

What watershed is the delineated wetland within?

_SVC140_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Small, high value, linear riparian PEM wetland, with high vegetative diversity; located along stream S22, formed by stream floodplain surrounded by Beach-Maple forested area. Receives water via overland flow from east and west and from stream S22 during high water events and by groundwater discharge. Outlets via Stream S22 flow to the north and to groundwater.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Marciano | Date: 4/30/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC140-W23<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10% | | | | |
| *Glyceria striata* | H | OBL | 30% | | | | |
| *Veratrum viride* | H | FACW+ | 15% | | | | |
| *Equisetum arvense* | H | FACW- | 10% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 10 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 7.5yr 2.5/1 | 7.5yr 5/4 | 3%, small, distinct | Very moist silt loam |
| 5-14+ | B | 2.5y 5/3 | 10 yr 5/6 | 15%, large, faint | Very moist silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_

Stream name (if known):

_Stream S22, Unnamed tributary to Silver Creek_

Approximate distance to stream:

_150 feet_

What watershed is the delineated wetland within?

_SVC140_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: __

**Rationale/Remarks:**

**Small, low value PEM, with low vegetative diversity, associated with natural swale and some inundated machinery ruts in upland forest. Receives surface runoff and runoff from ruts (P120) during storm events. Drains northeast to Wetland W22-26 via drain D23-1, ultimately to Stream S22, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Kielaszek | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC140-W24<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | *Ulmus americana* | T | FACW- | 15 |
| *Veratrum viride* | H | FACW+ | 25 | | | | |
| *Erythronium americanum* | H | FACU | 20 | | | | |
| *Rubus hispidus* | H | FACW | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 30 | | | | |
| *Acer rubrum* | T | FAC | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 10YR 2/2 | - | - | Saturated silt loam |
| 7-15 | B | 10YR 5/2 | 5YR 5/8 | 2%, small, faint | Very moist sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation_

Stream name (if known):

_S22, Unnamed tributary to Silver Creek_

Approximate distance to stream:

_300 feet_

What watershed is the delineated wetland within?

_SVC140_

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: __

**Rationale/Remarks:**

**Moderate size and value PFO, with moderate vegetative diversity located on Northeast side of sloping hill. High groundwater recharge and discharge function and value. Historic logging ruts and inundated pools (from ruts) in many places. Receives surface runoff from surrounding up-gradient areas and from groundwater discharge. Drains northeast via drain D24 into adjacent wetland W22. Also receives surface water runoff from wetland W13 via drains D13-1 and D13-2.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Kielaszek | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC140-W25<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 15 | | | | |
| *Carex* sp. | H | ≥FAC | 10 | | | | |
| *Acer rubrum* | T | FAC | 40 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |
| *Tsuga canadensis* | T | FACU | 2 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10YR 2/2 | - | - | Saturated silt loam with 30% partially decomposed organic matter |
| 6-14 | B | 2.5Y 6/3 | 7.5YR 5/8 | 3%, small, distinct | Moist sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation and desktop review

Stream name (if known):

S22, Unnamed tributary to Silver Creek

Approximate distance to stream:

200 feet

What watershed is the delineated wetland within?

SVC140

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small PFO ¼ with pit and mound topography on slightly north-sloping hill. Receives surface runoff via drain D25 at wetland flag W25-1. Drain D25 drains north (D25-5 to D25-7) before reverting to discrete overland flow into wetland W15, draining ultimately to unnamed tributary to Silver Creek (S22).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco & A. Kielaszek | Date: 05/01/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS/PFO<br>Transect ID: SVC142-W26<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 15 | | | | |
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Rubus hispidus* | H | FACW | 5 | | | | |
| *Acer rubrum* | T | FAC | 10 | | | | |
| *Ulmus americana* | T | FACW- | 10 | | | | |
| *Salix* sp. | S | >FAC | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Alden mucky silt loam**

Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/2 | - | - | Saturated silt loam | |
| 5-15 | B | 10YR 3/1 | 5YR 5/8 | 3%, small, faint | Very moist sandy silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation and desktop review_____

_____

Stream name (if known):

_S22, Unnamed tributary to Silver Creek_____

Approximate distance to stream:

_1100 feet_____

What watershed is the delineated wetland within?

_SVC142 and SVC 140_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: __ _____

**Rationale/Remarks:**

**Large PEM/PSS/PFO wetland complex with moderate value and vegetative diversity. Primarily PEM/PSS throughout with PFO components mainly along periphery. Positioned on north-northeast sloping hillsides. Receives surface water runoff from up-gradient wetland and groundwater discharge. Extends northeast beyond the survey corridor. Presumably drains into unnamed tributary of Silver Creek (S22).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszek | Date: 5/2/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC142-W27<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15% | | | | |
| *Osmunda cinnamomea* | H | FACW | 20% | | | | |
| *Veratrum viride* | H | FACW+ | 15% | | | | |
| *Betula alleghaniensis* | T | FAC | 20% | | | | |
| *Tsuga canadensis* | T | FACU | 20% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 1 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Alden mucky silt loam**
Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**
Field observations confirm mapped type? ☐ Yes ☒ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-16 | O | - | - | - | Saturated H3 peat | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation and desktop review

Stream name (if known):
Unnamed tributary to Silver Creek (S22 outside of the survey corridor)

Approximate distance to stream:
1500 feet

What watershed is the delineated wetland within?
SVC142

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, high value PFO ¼ wetland, with moderate vegetative diversity. Located near top of northeast-sloping hill in a natural depression. Receives surface water runoff from up-gradient areas in the vicinity of W27-9 and -10. Outflow via Drain D27 northeast in to Wetland W26, ultimately reaching an unnamed tributary to Silver Creek (S22). High groundwater recharge and discharge and wildlife habitat value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, J. Zoladz | Date: 05/03/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: NBC49-W33<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 30 | | | | |
| *Typha latifolia* | H | OBL | 20 | | | | |
| *Salix discolor* | S | FACW | 15 | | | | |
| *Viburnum recognitum* | S | FACW- | 15 | | | | |
| *Salix nigra* | T | FACW+ | 5 | | | | |
| *Solidago gigantea* | H | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 8 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Erie silt loam**
Taxonomy (subgroup) **Aeric Fragiaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 10YR 2/2 | - | - | Saturated silty clay loam with ~50% PDOM |
| 10-16 | B | 5YR 5/1 | 7.5YR 5/8 | 5% large, distinct | Slightly moist silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor (Slight)
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field observation _____
_____

Stream name (if known):
_ S31, Unnamed tributary to North Branch Conewango Creek

Approximate distance to stream:
_1100 feet_____

What watershed is the delineated wetland within?
_North Branch Conewango Creek
49_____

Comments:
_ Mapped in NBC 49 but flows to NBC 46_____ _____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PEM/PSS with moderate vegetative diversity located in broad swale between cow pasture to south and crop fields to east and west. Receives surface runoff from south via drain D33, which becomes channelized in the cow pasture and extends to a roadside ditch on the north side of the wetland. Moderate toxicant filtering and wildlife habitat function and value. Roadside ditch drains to the northwest through culvert under Bartlett Hill Road and flows to a farm pond. Upon further desktop review, the pond outflow will drain northeast, and then north to the headwaters of stream S31 and ultimately to North Branch Conewango Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Zoladz | Date: 5/6/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC129-W49<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | OBL | 40% | | | | |
| *Juncus effusus* | H | FACW | 5% | | | | |
| *Ranunculus repens* | H | FAC | 20% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _run-off from_<br>☐ Oil Sheen present _active cow pasture_ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: at surface<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 2/2 | | Small, distinct, 5% | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation

Stream name (if known):

__Unnamed tributary to Silver Creek (S1001)_____

Approximate distance to stream:

__225 feet_____

What watershed is the delineated wetland within?

___SVC129_____

Comments:

_Stream S1001 is mapped as Stream S551 downstream in different sector.

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity located at the confluence of 2 drains in active cow pasture; heavily disturbed. Receives up-gradient surface water run-off and drains east via drain D49 to stream S1001, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A Kielaszek | Date: 6/5/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Old Logging Road | Community ID: PEM<br>Transect ID: SVC138-W122<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10% | | | | |
| *Solidago rugosa* | H | FAC | 10% | | | | |
| *Impatiens capensis* | H | FACW | 20% | | | | |
| *Glyceria striata* | H | OBL | 40% | | | | |
| *Fragaria virginana* | H | FACU | 10% | | | | |
| *Potentilla simplex* | H | FACU | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 0-3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 10yr 4/1 | 10r 3/8 | Large, distinct, 12% | Moist Silt loam |
| | | | 7.5yr 6/8 | 3%, small, distinct | Mottles in A horizion are compressed in sheets |
| 8-12+ | B | 10yr 6/3 | - | - | Sandy loam, some gravel |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☒ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation_____

Stream name (if known):

_S16, Unnamed tributary to Silver Creek

_____

Approximate distance to stream:

_700 feet_____

What watershed is the delineated wetland within?

_SVC138_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: _None, Isolated_____

**Rationale/Remarks:**

**Small, low value PEM wetland with low vegetative diversity, associated with historic logging roads. Receives surface runoff via up-gradient runoff. Drains northeast into machinery ruts in adjacent field, without reaching wetland W17. No connection to traditionally navigable waters observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A Kielaszek | Date: 6/5/2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC140-W123<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10% | | | | |
| *Carex* sp. | H | >FAC | 50% | | | | |
| *Impatiens capensis* | H | FACW | 20% | | | | |
| *Glyceria striata* | H | OBL | 20% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: na inches<br>Depth to free water in pit: na inches<br>Depth to saturated soil: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 10yr 3/1 | 10yr 5/8 | 3%, small, distinct | Moist silty clay loam | |
| | | | 20yr, 3/6 | 20% large, distinct | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation_____

Stream name (if known):

_S123, Unnamed tributary to Silver Creek

Approximate distance to stream:

_Abutting_____

What watershed is the delineated wetland within?

_SVC140_____

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Small, low value PEM with low vegetative diversity. Associated with historic, wet logging road crossing. Wetland located within stream S123 which flows east to S22 near W22, and drains ultimately to Silver Creek.**

**FEATURE ID : NBC39-S9**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to North Branch Conewango Creek

Date: 04/24/08

State: NY

Observers: A. Francisco, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: Narrow channel with 20 to 30 foot floodplain

Tributary is: Natural ☒ Manipulated ☐

Watershed: _North Branch Creek 39_____

Stream Flow Direction _East_____

Width (ft) (water's edge to water's edge) ____4_____

Width (ft) (bank to bank) ____6-8_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : NBC39-S9**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☐ | 0-3 ft. | ☐ | 0-3 ft. |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _East_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☐ | 0 -20% (0-11°) | ☐ |
| ☐ | 21 – 50% (12-27°) | ☒ |
| ☒ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_____

Presence of Riffle/Run/Pools? _____

Evidence of Erosion? _Minor scour_____

Description of Erosion: _Minor scour in thalweg of meanders

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No

If yes, list: *Veratrum viride, Onoclea sensibilis, Ranunculus sp.*

Approximate Riparian Width (facing d.s.) n/a ft left bank

20 ft right bank

Aquatic Vegetation ☐ Yes ☒ No

If yes, list:

Associated Wetland ☒ Yes ☐ No

If yes, list: W9

Aquatic Organisms ☒ Yes ☐ No

If yes, list: Crayfish

Riparian/Terrestrial Organisms ☒ Yes ☐ No

If yes, list: Frogs

T&E Species ☐ Yes ☒ No

If yes, list:

Comments:

Comments:

Stream S9 is a perennial stream, flowing east, associated with riparian wetland W9.

**FEATURE ID : SVC140-S22_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 4/30/08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: __SVC140_____

Stream Flow Direction ____Northeast _____

Width (ft) (water's edge to water's edge) __2'_____

Width (ft) (bank to bank) _____3'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☒ Other

_Silty with other sediments_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : SVC140-S22_____**

**Bank Height and Slope**

Left Bank Ht*

- ☒ 0-3 ft.
- ☐ 3-6 ft.
- ☐ 6+ ft.

Right Bank Ht*

- ☒ 0-3 ft.
- ☐ 3-6 ft.
- ☐ 6+ ft.

*Direction when facing downstream: _Northeast_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☒ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _____No_____

Presence of Riffle/Run/Pools? ____Very small_____

Evidence of Erosion? _____No_____

Description of Erosion:

_____

**Associated Habitat**

Riparian Vegetation ☒ Yes ☐ No

If yes, list:

*Veratrum viride, Onoclea sensibilis, Glyceria striata*

Approximate Riparian Width (facing d.s.) 4 ft left bank

30 ft right bank

Aquatic Vegetation ☒ Yes ☐ No

If yes, list: Duck weed

Associated Wetland ☒ Yes ☐ No

If yes, list: Wetland W22

Aquatic Organisms ☒ Yes ☐ No

If yes, list: Aquatic insects

Riparian/Terrestrial Organisms ☐ Yes ☒ No

If yes, list:

T&E Species ☐ Yes ☒ No

If yes, list:

Comments:

Comments:

Stream S22 is a perennial stream which flows northeast beyond survey corridor into larger wetland complex. Stream is associated with riparian wetland W22, within the banks of S22.

**FEATURE ID : SVC140-S123_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 6/6/08

State: NY

Observers: A. Francisco, A Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ____SVC140_____

Stream Flow Direction _Northwest_____

Width (ft) (water's edge to water's edge) ___1-3'_____

Width (ft) (bank to bank) _____2-5'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : SVC140-S123_____**

**Bank Height and Slope**

Left Bank Ht*

- ☒ 0-3 ft.
- ☐ 3-6 ft.
- ☐ 6+ ft.

Right Bank Ht*

- ☒ 0-3 ft.
- ☐ 3-6 ft.
- ☐ 6+ ft.

*Direction when facing downstream: ___NW_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☐ |
| ☐ | 21 – 50% (12-27°) | ☒ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? ___NO_____
Presence of Riffle/Run/Pools? _No_____
Evidence of Erosion? _____Yes_____
Description of Erosion: _Shelving on southeast bank_____
Comments:
Small stream flowing northwest through wet logging road (Wetland W123) into stream S22.

**Associated Habitat**

Riparian Vegetation ☒ Yes ☐ No
If yes, list: *Glyceria striata*

Approximate Riparian Width (facing d.s.) ft left bank
ft right bank

Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☒ Yes ☐ No
If yes, list: W123

Aquatic Organisms ☐ Yes ☒ No
If yes, list:

Riparian/Terrestrial Organisms ☐ Yes ☒ No
If yes, list:

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

**FEATURE ID : SVC129-S1001 .**

**STREAM DATA SHEET**

County: Chautauqua | Stream Name: Unnamed tributary to Silver Creek

Date: 5/8/08 | State: NY

Observers: H. Childs, A. Kielaszek, J. Zoladz

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: Near-ox bow meandering

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC129

Stream Flow Direction Northeast

Width (ft) (water's edge to water's edge) 4-6

Width (ft) (bank to bank) 7-10

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

cobble

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**
- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC129-S1001 .**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: Northeast

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☐ | 0 -20% (0-11°) | ☒ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☒ | 100% + (46°+) | ☐ |

Evidence of Pollution? No

Presence of Riffle/Run/Pools? riffles

Evidence of Erosion? Yes

Description of Erosion: exposed roots, undercutting

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No

If yes, list: *Salix sp., Equisetum sp.*

Approximate Riparian Width (facing d.s.) 0-1 ft left bank
1-3 ft right bank

Aquatic Vegetation ☐ Yes ☒ No

If yes, list:

Associated Wetland ☒ Yes ☐ No

If yes, list: W551

Aquatic Organisms ☐ Yes ☒ No

If yes, list: None observed, but likely occurring

Riparian/Terrestrial Organisms ☒ Yes ☐ No

If yes, list: Various birds

T&E Species ☐ Yes ☒ No

If yes, list:

Comments:

Comments:

Stream S1001 drains north to culverted road. Stream comes off wetland W4 and goes north to unnamed tributary to Silver Creek. (P18, P19). Stream S551 begins at culvert and abuts wetland W551 on its east border. Japanese knotweed (invasive) grows on east bank. (P765, P766, P767)

**FEATURE ID : SVC129-S1001**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 04/23/08

State: NY

Observers: A. Francisco, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _SVC129_____

Stream Flow Direction _North-northeast_____

Width (ft) (water's edge to water's edge) ____3_____

Width (ft) (bank to bank) ____10-12_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC129-S1001**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _North-northeast_

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☐ | 0 -20% (0-11°) | ☐ |
| ☒ | 21 – 50% (12-27°) | ☒ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_
Presence of Riffle/Run/Pools? _Yes, small ones_
Evidence of Erosion? _Yes_
Description of Erosion: _Minor bank cutting_
Comments:

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No
If yes, list: *Cornus stolonifera*

Approximate Riparian Width (facing d.s.) ft left bank
ft right bank

Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☐ Yes ☒ No
If yes, list:

Aquatic Organisms ☒ Yes ☐ No
If yes, list: Minnows

Riparian/Terrestrial Organisms ☒ Yes ☐ No
If yes, list: Frogs

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

Stream S1001 drains north beyond survey corridor. Stream comes off wetland W4 and goes north to unnamed tributary to Silver Creek.

**FEATURE ID : SVC129-S1001A**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5-6-08

State: NY

Observers: Andy Francisco

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: Short trib. to S1001 starts as groundwater seep

Tributary is: Natural ☒ Manipulated ☐

Watershed: _SVC129_____

Stream Flow Direction __Northeast_____

Width (ft) (water's edge to water's edge) _18"____

Width (ft) (bank to bank) _2-3'_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☒ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC129-S1001A**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _Northeast_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☒ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_____

Presence of Riffle/Run/Pools? _No_____

Evidence of Erosion? _Very minor_____

Description of Erosion: _Some minor erosion near merger with S1001_

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No

If yes, list: Dogwood, Salix sp.

Approximate Riparian Width (facing d.s.) 2 ft left bank

ft right bank

Aquatic Vegetation ☐ Yes ☒ No

If yes, list:

Associated Wetland ☐ Yes ☒ No

If yes, list: W46

Aquatic Organisms ☒ Yes ☐ No

If yes, list: Water strider

Riparian/Terrestrial Organisms ☐ Yes ☒ No

If yes, list:

T&E Species ☐ Yes ☒ No

If yes, list:

Comments:

Comments: S1001A starts as a groundwater seep and drains northeast to S1001 ~100 feet away.

# Sector D

## Cluster 19

### Wetland Photos

W533
(See Cluster 20 for W534)

### Drain Photos

NA

### Stream Photos

S533
(See Cluster 20 for S534)

### Turbine Location Photos

T38




Date: May 5, 2008
Location P674: Stream S533
Direction of View: South




Date: May 5, 2008
Location P675: Wetland W533
Direction of View: South




Date: May 5, 2008
Location P681: T38
Direction of View: North




Date: May 5, 2008
Location P682: T38
Direction of View: West




Date: May 5, 2008
Location P683: T38
Direction of View: South




Date: May 5, 2008
Location P684: T38
Direction of View: East

# Sector D

## Cluster 20

### Wetland Photos

W42, W43, W44, W45, W46, W47, W48, W117, W534, W534a, W535, W536, W537, W538, W539 and W540

### Drain Photos

D1010, D1011, D43, D44, D48

### Stream Photos

S44, S46 and S534

### Pond Photos

PO1500, PO47, PO48

### Turbine Location Photos

T39, T40, T41, T42, T43 and T45




Date: May 5, 2008
Location P685: T39
Direction of View: North




Date: May 5, 2008
Location P686: T39

Direction of View: West




Date: May 5, 2008
Location P687: T39
Direction of View: South




Date: May 5, 2008
Location P688: T39
Direction of View: East




Date: May 5, 2008
Location P676: Stream S534 and Wetland W534
Direction of View: North




Date: May 5, 2008
Location P677: Stream S534 and Wetland W534

Direction of View: South




Date: May 5, 2008
Location P678: Pool within Stream S534 near Wetland W534-25
Direction of View: North




Date: May 5, 2008
Location P679:  Continuation of Stream S534 and W534 (Downstream)

Direction of View: South




Date: May 5, 2008
Location P689: Wetland W534a
Direction of View: North




Date: May 5, 2008
Location P690: Wetland W534a

Direction of View: West




Date: May 5, 2008
Location P691: Wetland W534a
Direction of View: South




Date: May 5, 2008
Location P692: Wetland W534a

Direction of View: East




Date: May 6, 2008
Location P693: T40
Direction of View: North




Date: May 6, 2008
Location P694: T40

Direction of View: West




Date: May 6, 2008
Location P695: T40
Direction of View: South




Date: May 6, 2008
Location P696: T40

Direction of View: East




Date: May 6, 2008
Location P697: Wetland W535 from W535-4
Direction of View: West




Date: May 6, 2008
Location P698: Wetland W535 from W535-4

Direction of View: Northwest




Date: May 6, 2008
Location P699: Pond PO1500
Direction of View: Southeast




Date: May 6, 2008
Location P701: Wetland W536 from 20feet south of W536-7 and -8

Direction of View: Southeast




Date: May 6, 2008
Location P702: Wetland W536 from 20feet from W536-7 and -8
Direction of View: Northwest




Date: May 6, 2008
Location P703: Wetland W537 from WD537

Direction of View: Southwest




Date: May 6, 2008
Location P704: Wetland W537 from WD537
Direction of View: North




Date: May 6, 2008
Location P705: Wetland W537 from WD537

Direction of View: South



Date: June 4, 2008
Location P1637: Wetland W117 from east of W117-25 open
Direction of View: South



Date: June 4, 2008
Location P1638: Wetland W117 from approximately 30’ north of WD117

Direction of View: North



Date: June 4, 2008
Location P1639: Wetland W117 from approximately 30’ from WD117
Direction of View: South




Date: May 6, 2008
Location P706: Wetland W538 from between W538-3 and -4

Direction of View: East




Date: May 6, 2008
Location P707: Wetland W539 from W539-6
Direction of View: West




Date: May 6, 2008
Location P708: T41

Direction of View: North




Date: May 6, 2008
Location P709: T41
Direction of View: West




Date: May 6, 2008

Location P710: T41
Direction of View: South




Date: May 6, 2008
Location P711: T41
Direction of View: East




Date: May 6, 2008
Location P714: Wetland W540 from WD540

Direction of View: South




Date: May 6, 2008
Location P715: Wetland W540 from WD540
Direction of View: North



Date: May 6, 2008

Location P257: Pond PO48 and Drain D48 from Wetland W48-6
Direction of View: Northeast



Date: May 6, 2008
Location P258: Pond PO48, Drain D48 and Wetland W48 from D41-1
Direction of View: Southeast



Date: May 6, 2008

Location P254: Pond PO48
Direction of View: Southeast



Date: May 6, 2008
Location P255: Pond PO47a and PO48
Direction of View: East



Date: May 6, 2008
Location P252: Pond PO47 draining north to Wetland W47-6

Direction of View: Southeast



Date: May 6, 2008
Location P253: Wetland W47 from W47-6
Direction of View: East



Date: May 6, 2008

Location P256: Pond PO47a and Wetland W47
Direction of View: Northeast



Date: May 6, 2008
Location P248: T42
Direction of View: North



Date: May 6, 2008
Location P249: T42

Direction of View: West



Date: May 6, 2008
Location P250: T42
Direction of View: South



Date: May 6, 2008
Location P251: T42

Direction of View: East



Date: May 5, 2008
Location P229: T43
Direction of View: North



Date: May 5, 2008
Location P230: T43

Direction of View: West



Date: May 5, 2008
Location P231: T43
Direction of View: South



Date: May 5, 2008
Location P232: T43

Direction of View: East



Date: May 6, 2008
Location P239: Stream S46 and Wetland W46 from between W46-1 and -2
Direction of View: Southwest



Date: May 6, 2008
Location P240: Stream S46 (downstream) and Wetland W46 from W46-4
Direction of View: Northeast



Date: May 6, 2008
Location P241: Stream S46 (upstream) from between wetland W46-7 and -9
Direction of View: Southwest



Date: May 6, 2008
Location P242: Stream S46 (downstream) from between Wetland W46-7 and -9
Direction of View: Northeast



Date: May 6, 2008
Location P237: Wetland W45 from W45-9
Direction of View: North



Date: May 6, 2008
Location P238: Wetland W45 from W45-4b
Direction of View: East



Date: May 5, 2008
Location P233: Wetland W44 and Drain D44 inflow from W44-3
Direction of View: South



Date: May 5, 2008
Location P234: Wetland W44 and Drain D44 (downstream) from W44-3
Direction of View: North



Date: May 5, 2008
Location P235: Stream S44 (upstream) from SD44
Direction of View: South



Date: May 5, 2008
Location P236: Stream S44 (downstream) from SD44
Direction of View: North



Date: May 6, 2008
Location P243: T45
Direction of View: North



Date: May 6, 2008
Location P244: T45
Direction of View: West



Date: May 6, 2008
Location P245: T45
Direction of View: South



Date: May 6, 2008
Location P246: T45
Direction of View: East



Date: May 5, 2008
Location P222: Wetland W42 from southwest of W42-6 on farm road
Direction of View: Northeast



Date: May 5, 2008
Location P223: Wetland W42 from southwest of W42-6
Direction of View: West



Date: May 5, 2008
Location P228: Drain D42 at Access Road 19 crossing
Direction of View: North



Date: May 5, 2008
Location P220: Drain D1010, shovel at collection line crossing

Direction of View: Northwest



Date: May 5, 2008
Location P221: Drain D1011 inflow to Wetland W42-3
Direction of View: Northeast



Date: May 5, 2008
Location P224: Wetland W43 and WD43 from farm road
Direction of View: Southwest



Date: May 5, 2008
Location P225: Wetland W43 from farm road, Drain D43 inflow in background
Direction of View: East



Date: May 5, 2008
Location P226: Wetland W43
Direction of View: Southwest



Date: May 5, 2008
Location P227: Wetland W43 and Drain D43 into Drain D1011
Direction of View: Southeast

# Sector D

## Cluster 21

### Wetland Photos

W29, W29, W30, W31 and W32

### Drain Photos

NA

### Stream Photos

S31

### Turbine Location Photos

T46 and T47



Date: May 3, 2008
Location P177: T46
Direction of View: North



Date: May 3, 2008
Location P178: T46
Direction of View: West



Date: May 3, 2008
Location P179: T46
Direction of View: South



Date: May 3, 2008
Location P180: T46

Direction of View:
East



Date: May 3, 2008
Location P181: Wetland W31 and Stream S31 from Access Road 21 crossing
Direction of View: Northwest



Date: May 3, 2008
Location P182: Wetland W31 and Stream S31 from Access Road 21 crossing

Direction of View: Southeast



Date: May 3, 2008
Location P183: Wetland W31 and Stream S31 at Access Road 21 crossing
Direction of View: North



Date: May 3, 2008
Location P184: Drain tile inflow to Wetland W31, from southwest of W31-3

Direction of View: Northeast



Date: May 3, 2008
Location P185: Wetland W32 and compost/dead cow pile from W32-1
Direction of View: Northwest



Date: May 3, 2008
Location P186: Discrete overland flow from Wetland W32-1 to Stream S31

Direction of View: Southeast



Date: June 5, 2008
Location P1645: Wetland W120 from W120-6
Direction of View: North



Date: June 5, 2008

Location P1646: Wetland W121 from W120-6 and Drain D120-1
Direction of View: South



Date: June 5, 2008
Location P1647: Drain D121 from W121-2
Direction of View: South



Date: June 5, 2008
Location P1648: Wetland W121 from W121-2

Direction of View: East



Date: May 2, 2008
Location P170: Wetland W30 from Access Road 21 crossing southwest of W30-10
Direction of View: Northwest



Date: May 2, 2008
Location P171: Wetland W30 into cow pasture, from Access Road 21 crossing

Direction of View: Southwest



Date: May 2, 2008
Location P172: Wetland W30 into cow pasture from Access Road 21 crossing
Direction of View: South



Date: May 2, 2008
Location P174: Wetland W30 from Access Road 21 crossing

Direction of View: North



Date: May 2, 2008
Location P175: Wetland W30 and small pool with frogs
Direction of View: Northwest



Date: May 2, 2008
Location P176: Questionable wet area within Wetland W30, south of W30-2

Direction of View: Southeast



Date: May 2, 2008
Location P158: T47
Direction of View: North



Date: May 2, 2008
Location P159: T47
Direction of View: West



Date: May 2, 2008
Location P160: T47
Direction of View: South



Date: May 2, 2008
Location P161: T47
Direction of View: East



Date: May 2, 2008
Location P162: Wetland W28 from south of W28-10
Direction of View: North



Date: May 2, 2008
Location P163: Wetland W28, where it drains south into a pasture, from south of W28-20
Direction of View: North



Date: May 2, 2008
Location P164: Wetland W28 (W28-22 open on far side of pasture)
Direction of View: South



Date: May 2, 2008
Location P165: Wetland W28-7a to -7d, wet logging road
Direction of View: Northeast



Date: May 2, 2008
Location P166:  Wetland W29 from W29-1open
Direction of View: Southeast



Date: May 2, 2008
Location P167: Wetland W29 beyond survey corridor from W29-1
Direction of View: Southwest



Date: May 2, 2008
Location P168: Wetland W29 from between W29-6 and -7
Direction of View: Northwest



Date: May 2, 2008
Location P169: Wetland W29 draining southeast into NBC46 from between W29-6 and -7
Direction of View: Southeast

# Sector D

## Cluster 22

### Wetland Photos

W16, W18, W34, W35, W36, W37, W38, W39, W40 and W41

### Drain Photos

D1003, D1004, D1005, D1006, D1009, and D40

### Stream Photos

S16

### Pond Photos

PO1000

### Turbine Location Photos

T48, T50 and T51



Date: April 29, 2008
Location P83: Drain D1003 from Access Road 22
Direction of View: South



Date: April 29, 2008
Location P84: Drain D1003 from Access Road 22
Direction of View: East



Date: April 29, 2008
Location P85: Drain D1003, where it drains into Drain D1004
Direction of View: West



Date: April 29, 2008
Location P86: Drain D1003, where it drains into Drain D1004
Direction of View: South



Date: April 29, 2008
Location P87: Drain D1004 crosses Access Road 22 at old culvert
Direction of View: North



Date: April 29, 2008
Location P88: Wetland W18 from southeast of W18-1
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P89:  Wetland W18 overland flow from W18-1 to Drain D1004
Direction of View: West



Date: May 2, 2008
Location P: T50
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 2, 2008
Location P: T50
Direction of View: West



Date: May 2, 2008
Location P: T50
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 2, 2008
Location P: T50
Direction of View: East



Date: May 2, 2008
Location P148: Drain D1006
Direction of View: West



Date: May 2, 2008
Location P149: Drain D1006, shovel at Access Road 22 crossing
Direction of View: East



Date: May 5, 2008
Location P219: Drain D1009 endpoint in cornfield
Direction of View: Southwest



Date: May 5, 2008
Location P218: Drain D1009 crossing of Access Road 22 at fence cover
Direction of View: East



Date: May 5, 2008
Location P217: Wetland W41 from southwest of Drain D41-1
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 5, 2008
Location P214: Pond PO1000 and bank cut where Drain D40 goes into Wetland W40
Direction of View: Northeast



Date: May 5, 2008
Location P211: Wet area along Access Road 22 from west side of Pond PO1000
Direction of View: South



Date: May 5, 2008
Location P212: Southeast corner of Pond PO1000 where is drains into Wetland W37
Direction of View: Southeast



Date: May 5, 2008
Location P213: Pond PO1000
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 5, 2008
Location P209: Wetland W39 from southwest of W39-2
Direction of View: Northeast



Date: May 5, 2008
Location P210: Wetland W39 from southwest of W39-2
Direction of View: Northwest



Date: May 5, 2008
Location P207: Wetland W38 from WD38 and inundated pool
Direction of View: South



Date: May 5, 2008
Location P208: Wetland W38 from WD38 and Drain D38 going North to Wetland W37
Direction of View: North



Date: May 5, 2008
Location P206: South end of Pond PO1000 where it drains into Wetland W37
Direction of View: Northeast



Date: May 5, 2008
Location P205: Wetland W37 and confluence with Pond PO1000 from WD37
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 5, 2008
Location P204: Wetland W37 from north of WD37
Direction of View: South



Date: May 5, 2008
Location P203: Wetland W36 from WD36
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 5, 2008
Location P202:  Wetland W36 from WD36
Direction of View: Northeast



Date: May 3, 2008
Location P196: Wetland W34 from W34-7
Direction of View: North



Date: May 3, 2008
Location P197: Wetland W34 from W34-7
Direction of View: East



Date: May 3, 2008
Location P198: Wetland W35 where it continues beyond survey corridor at W35-29open
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 3, 2008
Location P199: Wetland W35 from south of W35-14
Direction of View: West



Date: May 3, 2008
Location P200: Wetland W35 from south of W35-14
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 3, 2008
Location P201: Wetland W35 from south of W35-14
Direction of View: Northeast



Date: June 12, 2008
Location P1679: T48
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 12, 2008
Location P1680: T48
Direction of View: West



Date: June 12, 2008
Location P1681: T48
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 12, 2008
Location P1682: T48
Direction of View: East



Date: April 29, 2008
Location P90: Drain D1005 crossing of Access Road 22 at shovel
Direction of View: North



Date: April 29, 2008
Location P91: Drain D16 in flow to Wetland W16 at W16-9
Direction of View: East



Date: April 29, 2008
Location P92: South end of Wetland W16 from north of W16-105
Direction of View: Southeast



Date: April 29, 2008
Location P93: Tire ruts in Wetland W16 from north of W16-105
Direction of View: Northeast



Date: April 29, 2008
Location P94: Wetland W16 from south of W16-8b
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P95: Wetland W16 from south of W16-8
Direction of View: West



Date: April 29, 2008
Location P96: Wetland W16 at Access Road 22 crossing (shovel) and Stream S16
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P101: T51
Direction of View: North



Date: April 29, 2008
Location P102: T51
Direction of View: West



Date: April 29, 2008
Location P103: T51
Direction of View: South



Date: April 29, 2008
Location P104: T51
Direction of View: East

# Sector D

## Cluster 23

### Wetland Photos

W1, W2, W3, W4, W5, W6, W7, W8 and W124

### Drain Photos

D2b, D3, D4c, and D6

### Stream Photos

S1000, S1002, and S7

### Turbine Location Photos

T52, T53 and T55

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 6, 2008
Location P1662: Drain D1025 inflow to culvert, from road
Direction of View:  West



Date: June 6, 2008
Location P1663: Drain D1025 outflow from culvert
Direction of View: Northeast



Date: April 21, 2008
Location P06: T55
Direction of View: North



Date: April 21, 2008
Location P07: T55
Direction of View: West



Date: April 21, 2008
Location P08: T55
Direction of View: South



Date: April 21, 2008
Location P09: T55
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P17: Drain D3 and PEM portion of Wetland W2-9
Direction of View: Northeast



Date: April 21, 2008
Location P10: Wetland W3 from 20’ south of W3-2
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P11: Wetland W3 from 20’ south of W3-2
Direction of View: Southeast



Date: April 21, 2008
Location P12: Drain D3 from 40’ northwest of W3-1
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 6, 2008
Location P1661: Where Wetland W3 used to be, from 40’ northwest of W3
Direction of View: North



Date: April 21, 2008
Location P04: Stream S1000, upstream
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P05: Stream S1000, downstream
Direction of View: East



Date: April 21, 2008
Location P13: Wetland W2 from W2-1
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008




Date: April 21, 2008
Location P14: Wetland W2 from W2-7
Direction of View: Northwest



Date: April 21, 2008
Location P15: Wetland W2 from W2-7
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P16: Drain D2b from 20’ east of W2-7
Direction of View: North



Date: April 21, 2008
Location P02: Wetland W1 from W1-1 and W1-7
Direction of View: East Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 21, 2008
Location P03: Wetland W1-8 and W1-14
Direction of View: East Southeast



Date: April 23, 2008
Location P21: East edge of Wetland W4 from W4-39
Direction of View: South



Date: April 23, 2008
Location P22: East Edge of Wetland W4, and Drain D4c-4 and D4c-5
Direction of View: North



Date: April 23, 2008
Location P23: Wetland W4 from 15’ northeast of W4-10
Direction of View: South



Date: April 23, 2008
Location P24: Wetland W4 (cow pasture) from 15' northeast of W4-10
Direction of View: Southeast



Date: April 23, 2008
Location P25: Wetland W4 at linear segment 15' northeast of W4-10
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 23, 2008
Location P26: Wetland W4 at PFO/PSS component, at 15’ northeast of W4-10
Direction of View: Northwest



Date: April 23, 2008
Location P31: Wetland W5 from WD5
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 23, 2008
Location P32: Wetland W5 from WD5
Direction of View: North



Date: June 6, 2008
Location P1658: Wetland W124, logging road portion on south edge
Direction of View: Northwest



Date: June 6, 2008
Location P1659: Wetland W124, forested portion
Direction of View: North



Date: June 6, 2008
Location P1660: Logging road portion of Wetland W124 from 15’ south of WD124
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 23, 2008
Location P35: Drain D6 going to Stream S1002 from Wetland W6-25
Direction of View: East



Date: April 23, 2008
Location P33: Stream S1002 upstream from SD1002
Direction of View: West



Date: April 23, 2008
Location P34: Stream S1002 downstream from SD1002
Direction of View: East



Date: April 23, 2008
Location P36: Wetland W6 from W6-16
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 23, 2008
Location P37: Wetland W6 from W6-16
Direction of View: South



Date: April 24, 2008
Location P43: Wetland W7 from WD7
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 24, 2008
Location P46: Wetland W7 from half way between W7-4 and -12
Direction of View: Southwest



Date: April 24, 2008
Location P44: Stream S7 upstream at groundwater seep and stream origination
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 24, 2008
Location P45: Stream S7 downstream, where Wetland W7 abut stream beyond survey corridor
Direction of View: North



Date: April 23, 2008
Location P38: T53
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 23, 2008
Location P39: T53
Direction of View: West



Date: April 23, 2008
Location P40: T53
Direction of View: South



Date: April 23, 2008
Location P41: T53
Direction of View: East



Date: April 23, 2008
Location P42: Vernal pool and logging road north of T53
Direction of View: South



Date: April 24, 2008
Location P49: Wetland W8 from east of W8-11
Direction of View: South



Date: April 24, 2008
Location P50: Wetland W8 from W8-11
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 24, 2008
Location P51: T52
Direction of View: North



Date: April 24, 2008
Location P52: T52
Direction of View: West



Date: April 24, 2008
Location P53: T52
Direction of View: South



Date: April 24, 2008
Location P54: T52
Direction of View: East

# Sector D

## Collection Line

### Wetland Photos

W9, W10, W11, W12, W13, W14, W15, W17, W19, W20, W21, W22, W23, W24, W25, W26, W27, W33, W49, W122 and W123

### Stream Photos

S1001, S1001a, S9, S22 and S123

### Drain Photos

D1007, D1008, D17a, D26, D27 and D49

### Pond Photos

PO5000

### Turbine Location Photos

NA

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 6, 2008
Location P1650: Inundated logging road that drains northeast and provides hydrology to Wetland W20
Direction of View: North Northeast



Date: June 6, 2008
Location P1651: Forested component of Wetland W20 going northeast from 20’ east of W20-1I
Direction of View: Northeast



Date: April 30, 2008
Location P108: Wetland W20, PFO component, from Southeast of W20-5
Direction of View: Southwest



Date: April 30, 2008
Location P109: Wetland W20, PEM component, from southeast of W20-5
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 30, 2008
Location P110: Drain D20 in ruts from north of W20-7
Direction of View: North



Date: June 6, 2008
Location P1652: Wetland W123 and Stream S123 crossing from W123-7
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 6, 2008
Location P1653: Stream S123 crossing Wetland W123 (logging road)
Direction of View: West



Date: June 6, 2008
Location P1654: Stream S123 (downstream) flowing to Stream S22 from 8’ west of SD123
Direction of View: East



Date: June 6, 2008
Location P1655: Stream S123 inflow to Wetland W22 from W22a-8
Direction of View: North



Date: June 6, 2008
Location P1656: Stream S123 (upstream) from 10’ east of Wetland W22a-8
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 6, 2008
Location P1657: Stream S123 and Wetland W22a
Direction of View: Northeast



Date: April 29, 2008
Location P106: Wetland W19 from northwest of W19-6
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 29, 2008
Location P107: Wetland W19 from north of W19-5
Direction of View: East



Date: April 30, 2008
Location P111: Wetland W21 from south of W21-5
Direction of View: Northeast



Date: April 30, 2008
Location P112: Drain D21 going from Wetland W21-1 to W19-3
Direction of View: South southeast



Date: April 30, 2008
Location P113: Stream S22 (upstream) from southwest of W22-16
Direction of View: Southwest



Date: April 30, 2008
Location P114: Stream S22 (downsteam) and Wetland W22 from southwest of W22-16
Direction of View: Northeast



Date: April 30, 2008
Location P115: Stream S22 and Wetland W22 from edge of survey corridor, from W22-8
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 30, 2008
Location P116: Wetland W22 continuing south, from northeast of S22-8
Direction of View: Southeast



Date: April 30, 2008
Location P117: Wetland W22 and Stream S22 continuing north beyond survey corridor
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 30, 2008
Location P118: Wetland W22 from north of W22-23
Direction of View: North



Date: April 30, 2008
Location P119: Wetland W22 from north of W22-3
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 30, 2008
Location P122: Wetland W22 from west of W22-33, Drain D13a comes in from southeast
Direction of View: South



Date: April 30, 2008
Location P123: Wetland W22 from west of W22-33
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 30, 2008
Location P120: Wetland W23 from tire ruts at W23-1
Direction of View: Northeast



Date: April 30, 2008
Location P121: Wetland W23 from W23-15
Direction of View: Northeast



Date: May 1, 2008
Location P124: Wetland W24 from south of WD24, at Collection line crossing
Direction of View: North



Date: May 1, 2008
Location P125: Wetland W24 from south of WD24, at Collection line crossing
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P126: Wetland W24 from south of WD24, at Collection line crossing. Drain D22 flowing North
Direction of View: South



Date: May 1, 2008
Location P127: Wetland W24 from south of WD24, at Collection line crossing
Direction of View: East



Date: May 1, 2008
Location P128: Wetland W24 where Collection line crosses south end going to T49
Direction of View: North



Date: May 1, 2008
Location P129: Wetland W24 where Collection line crosses south end going to T49
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P130: Wetland W24 where Collection line crosses south end going to T49
Direction of View: South



Date: May 1, 2008
Location P131: Wetland W24 where Collection line crosses, inundated ruts start of Drain D24
Direction of View: East



Date: May 1, 2008
Location P137: Wetland W15 from 20’ northwest of WD15
Direction of View: East



Date: May 1, 2008
Location P138: Wetland W15 at Collection line from southeast of W15-113
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P139: Wetland W15 from Collection line, southeast of W15-113
Direction of View: West



Date: May 1, 2008
Location P140:  Wetland W25 and Drain D25 enters at W25-1
Direction of View: Southeast



Date: May 1, 2008
Location P141: Wetland W25 and Drain D25 where connects to W15, from east of W25-5
Direction of View: West



Date: May 1, 2008
Location P142: Wetland W26 and Drain D26 inflow from W26-11
Direction of View: West Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 1, 2008
Location P143: Wetland W26 and Drain D26 inflow from W26-11
Direction of View: Southeast



Date: May 2, 2008
Location P150: Drain D26a inflow to Wetland W26 at W26-24
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 2, 2008
Location P151: Wetland W26 from Drain D26at inflow northeast of W26-24
Direction of View: North northeast



Date: May 2, 2008
Location P152: Drain D27 flowing northeast out of Wetland W27
Direction of View: Southwest



Date: May 2, 2008
Location P153: Drain D27 flowing northeast into Wetland W26
Direction of View: Northeast



Date: May 2, 2008
Location P154: Trash at east edge of Wetland W27 from W27-21
Direction of View: Southeast



Date: May 2, 2008
Location P155: Wetland W27 from W27-21
Direction of View: South



Date: May 2, 2008
Location P156: Wetland W27 and Drain D27 draining into Wetland W26 , from W27-21
Direction of View: Northeast



Date: May 2, 2008
Location P157: Wetland W27 from south of W27-2
Direction of View: Northeast



Date: April 24, 2008
Location P55: Stream S9, at approximately 30’ south of Collection line
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 24, 2008
Location P56: Stream S9, at approximately 30’ south of Collection line
Direction of View: East



Date: April 24, 2008
Location P57: Wetland W9 within the banks of S9 (downstream)
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 24, 2008
Location P58: Wetland W9 within the banks of S9 (upstream)
Direction of View: East



Date: April 25, 2008
Location P59: Wet logging road with frogs on north edge of Wetland W9
Direction of View: Southeast



Date: April 25, 2008
Location P60: Wetland W10 from W10-10
Direction of View: Northeast



Date: April 25, 2008
Location P61: Wetland W10 and upland area to west from W10-10
Direction of View: South



Date: April 25, 2008
Location P62: Wetland W11 and inundated logging road from W11-4
Direction of View: West



Date: April 25, 2008
Location P63: Wetland W11 from W11-4
Direction of View: South



Date: April 25, 2008
Location P64: Wetland W11 from W11-4
Direction of View: North



Date: April 25, 2008
Location P65: Wetland W11 from 40’ northwest of W11-16 open
Direction of View: North



Date: April 25, 2008
Location P66: Wetland W11 and unmapped portion of Stream S9 beyond survey corridor
Direction of View: South



Date: April 25, 2008
Location P67: Wetland W12 from south of S12-3 and -4
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 25, 2008
Location P68: Vernal Pools and Wetland W13 at Collection line crossing
Direction of View: North



Date: April 25, 2008
Location P69: Wetland W13 from 20’ northwest of WD13
Direction of View: South



Date: April 25, 2008
Location P70: Wetland W13 from 20’ south of W13-15
Direction of View: North



Date: April 25, 2008
Location P71: Wetland W13 from 20’ south of W13-15
Direction of View: East



Date: April 25, 2008
Location P72: Wetland W13 from 20’ south of W13-15
Direction of View: South



Date: April 25, 2008
Location P73: Wetland W13 from 20’ south of W13-15
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: April 26, 2008
Location P74: Wetland W13 along Collection line from W13-41
Direction of View: East



Date: April 26, 2008
Location P75: Wetland W13 along Collection line from W13-14
Direction of View: West



Date: April 26, 2008
Location P76: Inundated logging ruts between W13-29 and -46a, start of Drain D13a
Direction of View: Northwest



Date: April 26, 2008
Location P77: Inundated logging road and frogs from W13-21 open
Direction of View: South



Date: April 26, 2008
Location P78: Logging road continuing north as Drain D13 beyond survey corridor
Direction of View: North



Date: April 26, 2008
Location P79: Wetland W14 at Wetland 14-10
Direction of View: East



Date: April 26, 2008
Location P80: Wetland W14 at W14-10
Direction of View: West



Date: April 26, 2008
Location P81: Wetland W14 (logging impacts) from W14-3
Direction of View: Southwest



Date: April 26, 2008
Location P82: North portion of Wetland W14 from W14-3
Direction of View: Northwest



Date: May 6, 2008
Location P261: Wetland W49 draining into road ditch
Direction of View: Northeast



Date: May 6, 2008
Location P262: Drain D49 inflow and Wetland W49 from east of W49-5
Direction of View: West



Date: May 6, 2008
Location P263: Drain D49 from Upland Data point UPD1 from Road
Direction of View: Southeast



Date: May 6, 2008
Location P265: Stream S1001a from Stream S1001
Direction of View: Southwest



Date: April 23, 2008
Location P18: Stream S1001 and culvert (inflow), from SD1001
Direction of View: North



Date: April 23, 2008
Location P19: Stream S1001, from SD1001
Direction of View: South



Date: April 23, 2008
Location P20: Groundwater seep within collection corridor
Direction of View: Southwest



Date: May 3, 2008
Location P187: Collection line crossing, east of Pond PO5000, looking at groundwater seep and Drain D1007
Direction of View: Northeast



Date: May 3, 2008
Location P188: Pond PO5000
Direction of View: West



Date: May 3, 2008
Location P189: Drain D1008 from D1008-2
Direction of View: South



Date: May 3, 2008
Location P190: Drain D1008 from D1008-2
Direction of View: Northeast



Date: May 3, 2008
Location P191: Wetland W33 from W33-5
Direction of View: Southwest



Date: May 3, 2008
Location P192: Wetland W33 from W33-5
Direction of View: West



Date: May 3, 2008
Location P193: Wetland W33 from W33-5
Direction of View: North



Date: May 3, 2008
Location P194: Wetland W33 from collection line crossing
Direction of View: East



Date: May 3, 2008
Location P195: Adjacent cow pasture west of Wetland W33 at collection line crossing
Direction of View: West



Date: April 29, 2008
Location P97: Wetland W17 from approximately 40’ southwest of W17-1
Direction of View: Southeast



Date: April 29, 2008
Location P98: Wetland W17 from approximately 40’ southwest of W17-1
Direction of View: East



Date: April 29, 2008
Location P99: Wetland W17 from approximately 40’ southwest of W17-1
Direction of View: Northeast



Date: April 29, 2008
Location P100: Drain D17a (old logging road) from between Wetland W17-1 and -15
Direction of View: North



Date: June 6, 2008
Location P1649: Wetland W122 from north of W122-2
Direction of View: South

# E Sector E

Sector E

Cluster 24

Wetland Datasheets

W551, W552, W553, W554, W556, W557

Stream Datasheets

No Streams

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: SVC129-W551<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Osmunda cinnamomea* | H | FACW | 5 | *Cornus stolonifera* | S | FACW+ | 5 |
| *Onoclea sensibilis* | H | FAC | 5 | *Salix* sp. | T | ≥FAC | 5 |
| *Typha latifolia* | H | OBL | 5 | *Solidago* sp. | H | ≥FAC | 10 |
| *Equisetum arvense* | H | FAC | 10 | *Mentha aquatica* | H | OBL | 10 |
| *Equisetum palustre* | H | FACW | 5 | | | | |
| *Polygonum cuspidatum* | H | FACU- | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:
*Polygonum cuspidatum* is invasive

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: .5-3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Flowing groundwater seep on west boundary, wetland abuts stream S551 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fluvaquents-Udifluvents complex, frequently flooded**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Fluvaquents**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 1-0 | O | --- | --- | --- | Saturated peaty, PDOM with fine roots | |
| 0-4 | A | 10YR 2/1 | --- | --- | Saturated silt with high organic content | |
| 4-10 | B | 10YR 3/4 | --- | --- | Saturated silt with >50% organic matter | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☒ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Channel width, flow width (field observation)_

Stream name (if known):

_Unnamed tributary to Silver Creek_(S551)__

Approximate distance to stream:

_Riparian

What watershed is the delineated wetland within?

SVC129

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, and value PEM/PSS wetland, with high vegetative diversity, with 2 Salix trees. Stream recharge, pollutant retention/filtration, and wildlife habitat values (moderate to high). Receives inflow from west via hillside runoff and via large groundwater seep. Flow is observed from seep through wetland W551 to stream S551 on east side of wetland (D551). Inflow also from drain D551a from west. Outflow via S551 an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC129-W552<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Onoclea sensibilis* | H | FAC | 20 | | | | |
| *Osmunda cinnamomea* | H | FACW | 2 | | | | |
| *Salix* sp. | T | ≥FAC | 5 | | | | |
| *Lilium* sp. | H | ≤FAC | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Groundwater seep on north side of wetland | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chenango Channery Loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 10YR 3/2 | --- | --- | Slightly moist silt loam |
| 7-12+ | B | 10YR 4/1 | 10YR 6/8 | 10% small, distinct | Saturated silty clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

Unnamed tributary to Silver Creek (S551)

Approximate distance to stream:

10 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC129

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with some stream recharge value, with little vegetative diversity. Receives inflow from north via drain D552a and hillside groundwater seep. Outflow via D552 to stream S551, which is approximately 10 feet away to the southeast, ultimately reaching an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: Open water PEM<br>Transect ID: SVC129-W553<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 30 | | | | |
| *Typha latifolia* | H | OBL | 20 | | | | |
| *Solidago* sp. | H | ≥FAC | 5 | | | | |
| *Lemnaceae* sp. | H | OBL | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-2 feet due to abutting pond inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 2.5Y 3/2 | --- | --- | Almost saturated silt clay |
| 5-10 | B | 2.5Y 4/2 | 5YR 3/4 | 15%, small, distinct | Moist silt clay with some sand |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S551, Unnamed tributary to Silver Creek

Approximate distance to stream:

400 feet

What watershed is the delineated wetland within?

SVC129

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, high wildlife value PEM wetland with low vegetative diversity, associated with farm pond PO553 that is NWI mapped wetland. Receives inflow from hillside runoff from southwest. No outflow observed. Burn pile in southwest corner probably within wetland. Wildlife observed include wood ducks, red-winged blackbirds and swallows in addition many tadpoles and other juvenile amphibians (maybe newts).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC129-W554<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15 | *Phalaris arundinacea* | H | FACW+ | 15 |
| *Solidago* sp. | H | >FAC | 10 | *Pyrus* sp. | T | FACU | 5 |
| *Impatiens capensis* | H | FACW | 10 | | | | |
| *Viburnum recognitum* | S | FACW- | 5 | | | | |
| *Cornus stolonifera* | S | FACW+ | 2 | | | | |
| *Ulmus americana* | S | FACW- | 1 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:
1 small Ulmus americana

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0.5-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area holds water. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10YR 2/1 | --- | --- | Saturated silt clay, many roots |
| 6-12 | B | 10YR 5/2 | 10YR 6/8 | 40%, small to large, distinct | Moist silt clay with few small concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Visual observation of flow

Stream name (if known):

Unnamed tributary to Silver Creek (Stream S552)

Approximate distance to stream:

500 feet

What watershed is the delineated wetland within?

SVC129

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, low value PEM wetland with few small shrubs, and 1 pear tree, with moderate vegetative diversity. Receives inflow from slopes on west/north sides. Topography slopes steeply on south and east sides. Overland flow from wetland W553 south via farm roads, to drain D552A, then to W552, then to stream S552, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in sparsely wooded area<br>Transect ID: SVC119-W556<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Solidago species* | H | > FAC | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 5 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0.5 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area holds water | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 2.5Y 4/1 | 5YR 4/6 | 5%, small, distinct | Saturated silt clay – Iron concretions, oxidized root zones |
| 5-10+ | B | 10YR 6/1 | 10YR 6/8 | 10%, small, distinct | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Visual observation of flow

Stream name (if known):

S561

Approximate distance to stream:

Approximately 500 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC119

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM in sparsely-forested area with low vegetative diversity, located in a small depressional area that holds runoff from slope to southeast (in active hayfield). No outflow observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC121-W557<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Solidago species* | H | ≥FAC | 10 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 10 | | | | |
| *Salix* sp | H | ≥FAC | 2 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Willow sprigs less than 3 feet tall

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present _15% of surface area | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 2.5Y 4/2 | 10YR 4/6 | 5%, small, distinct | Saturated silty clay |
| 7-14 | B | 5Y 5/4 | 7.5YR 4/6 | 2%, small, distinct | Moist silty clay with concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Concretions magnesium and iron

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation of flow and bank width

Stream name (if known):

S561, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

500 feet

What watershed is the delineated wetland within?

SVC121

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity, located in a depressional area. Electric fence bisects wetland. Connected to larger wetland complex outside corridor by discrete flow. Inflow from surface water runoff from adjacent up-gradient areas. Outflow through larger wetland complex via an unmapped drain which connects to stream S561, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: SVC129-W551<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Osmunda cinnamomea* | H | FACW | 5 | *Cornus stolonifera* | S | FACW+ | 5 |
| *Onoclea sensibilis* | H | FAC | 5 | *Salix* sp. | T | ≥FAC | 5 |
| *Typha latifolia* | H | OBL | 5 | *Solidago* sp. | H | ≥FAC | 10 |
| *Equisetum arvense* | H | FAC | 10 | *Mentha aquatica* | H | OBL | 10 |
| *Equisetum palustre* | H | FACW | 5 | | | | |
| *Polygonum cuspidatum* | H | FACU- | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:
*Polygonum cuspidatum* is invasive

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: .5-3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Flowing groundwater seep on west boundary, wetland abuts stream S551 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fluvaquents-Udifluvents complex, frequently flooded**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Fluvaquents**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 1-0 | O | --- | --- | --- | Saturated peaty, PDOM with fine roots | |
| 0-4 | A | 10YR 2/1 | --- | --- | Saturated silt with high organic content | |
| 4-10 | B | 10YR 3/4 | --- | --- | Saturated silt with >50% organic matter | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☒ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Channel width, flow width (field observation)_

Stream name (if known):

_Unnamed tributary to Silver Creek_(S551)__

Approximate distance to stream:

_Riparian

What watershed is the delineated wetland within?

SVC129

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, and value PEM/PSS wetland, with high vegetative diversity, with 2 Salix trees. Stream recharge, pollutant retention/filtration, and wildlife habitat values (moderate to high). Receives inflow from west via hillside runoff and via large groundwater seep. Flow is observed from seep through wetland W551 to stream S551 on east side of wetland (D551). Inflow also from drain D551a from west. Outflow via S551 an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC129-W552<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Onoclea sensibilis* | H | FAC | 20 | | | | |
| *Osmunda cinnamomea* | H | FACW | 2 | | | | |
| *Salix* sp. | T | ≥FAC | 5 | | | | |
| *Lilium* sp. | H | ≤FAC | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Groundwater seep on north side of wetland | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chenango Channery Loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 10YR 3/2 | --- | --- | Slightly moist silt loam |
| 7-12+ | B | 10YR 4/1 | 10YR 6/8 | 10% small, distinct | Saturated silty clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

Unnamed tributary to Silver Creek (S551)

Approximate distance to stream:

10 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC129

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with some stream recharge value, with little vegetative diversity. Receives inflow from north via drain D552a and hillside groundwater seep. Outflow via D552 to stream S551, which is approximately 10 feet away to the southeast, ultimately reaching an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: Open water PEM<br>Transect ID: SVC129-W553<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 30 | | | | |
| *Typha latifolia* | H | OBL | 20 | | | | |
| *Solidago* sp. | H | ≥FAC | 5 | | | | |
| *Lemnaceae* sp. | H | OBL | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-2 feet due to abutting pond inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 2.5Y 3/2 | --- | --- | Almost saturated silt clay |
| 5-10 | B | 2.5Y 4/2 | 5YR 3/4 | 15%, small, distinct | Moist silt clay with some sand |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S551, Unnamed tributary to Silver Creek

Approximate distance to stream:

400 feet

What watershed is the delineated wetland within?

SVC129

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, high wildlife value PEM wetland with low vegetative diversity, associated with farm pond PO553 that is NWI mapped wetland. Receives inflow from hillside runoff from southwest. No outflow observed. Burn pile in southwest corner probably within wetland. Wildlife observed include wood ducks, red-winged blackbirds and swallows in addition many tadpoles and other juvenile amphibians (maybe newts).**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC129-W554<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15 | *Phalaris arundinacea* | H | FACW+ | 15 |
| *Solidago* sp. | H | >FAC | 10 | *Pyrus* sp. | T | FACU | 5 |
| *Impatiens capensis* | H | FACW | 10 | | | | |
| *Viburnum recognitum* | S | FACW- | 5 | | | | |
| *Cornus stolonifera* | S | FACW+ | 2 | | | | |
| *Ulmus americana* | S | FACW- | 1 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:
1 small Ulmus americana

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0.5-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area holds water. | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10YR 2/1 | --- | --- | Saturated silt clay, many roots |
| 6-12 | B | 10YR 5/2 | 10YR 6/8 | 40%, small to large, distinct | Moist silt clay with few small concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Visual observation of flow

Stream name (if known):

Unnamed tributary to Silver Creek (Stream S552)

Approximate distance to stream:

500 feet

What watershed is the delineated wetland within?

SVC129

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, low value PEM wetland with few small shrubs, and 1 pear tree, with moderate vegetative diversity. Receives inflow from slopes on west/north sides. Topography slopes steeply on south and east sides. Overland flow from wetland W553 south via farm roads, to drain D552A, then to W552, then to stream S552, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in sparsely wooded area<br>Transect ID: SVC119-W556<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Solidago species* | H | > FAC | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 5 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0.5 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area holds water | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 2.5Y 4/1 | 5YR 4/6 | 5%, small, distinct | Saturated silt clay – Iron concretions, oxidized root zones |
| 5-10+ | B | 10YR 6/1 | 10YR 6/8 | 10%, small, distinct | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Visual observation of flow

Stream name (if known):

S561

Approximate distance to stream:

Approximately 500 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC119

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM in sparsely-forested area with low vegetative diversity, located in a small depressional area that holds runoff from slope to southeast (in active hayfield). No outflow observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC121-W557<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Solidago species* | H | ≥FAC | 10 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 10 | | | | |
| *Salix* sp | H | ≥FAC | 2 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Willow sprigs less than 3 feet tall

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present _15% of surface area | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 2.5Y 4/2 | 10YR 4/6 | 5%, small, distinct | Saturated silty clay |
| 7-14 | B | 5Y 5/4 | 7.5YR 4/6 | 2%, small, distinct | Moist silty clay with concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Concretions magnesium and iron

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation of flow and bank width

Stream name (if known):

S561, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

500 feet

What watershed is the delineated wetland within?

SVC121

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity, located in a depressional area. Electric fence bisects wetland. Connected to larger wetland complex outside corridor by discrete flow. Inflow from surface water runoff from adjacent up-gradient areas. Outflow through larger wetland complex via an unmapped drain which connects to stream S561, an unnamed tributary to Silver Creek.**

Sector E

Cluster 25

Wetland Datasheets

W129, W130, W131, W132, W133, W134, W565, W566, W573, W574 & W574A, W575, W576A-D, W577, W578, W579, W580, W581, W582, W583, W584, W585, W586, W587, W588, W589, W590, W591, W592, W593, W594, W605

Stream Datasheets

S132, S576, S577, S583, S591, S592, S592A, S594

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszak | Date: June 13, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO 1/4<br>Transect ID: SVC118-W129<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Impatiens capensis | H | FACW | 20% | Acer rubrum | T/H | FACW+ | 5% |
| Osmunda cinnamomea | H | FACW | 10% | Solidago rugosa | H | FAC | 5% |
| Onoclea sensibilis | H | FACW | 5% | Tsuga canadensis | T | FACU | 5% |
| Glyceria striata | H | OBL | 10% | | | | |
| Carex sp. | H | OBL | 30% | | | | |
| Ulmus americana | T | FACW | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 89%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 0-5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-2 | O | H2 | - | - | Moist Peat | |
| 3-5 | A | 10yr 6/2 | - | - | Moist silty clay loam | |
| 6-12+ | B | 2.5y 6/2 | 7.5yr 6/8 | 7% small, distinct | Clay loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation_____

_____

Stream name (if known):

_S576, unnamed tributary to Silver Creek___

Approximate distance to stream:

__55 meters _____

What watershed is the delineated wetland within?

___ SVC118_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PFO wetland with moderate vegetative diversity. Wetland made by interweaving old logging roads within a Beech-Maple upland forest. Receives surface water and drains south via overland flow to drain D129 to stream S576, an unnamed tributary to Silver Creek. High wildlife/amphibian habitat function and value. Moderate groundwater recharge/discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszak | Date: June 13, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC118-W130<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Glyceria striata | H | OBL | 10% | Cornus stolonifera | S | FACW+ | 5% |
| Onoclea sensibilis | H | FACW | 15% | Impatiens capensis | H | FACW | 10% |
| Eupatorium perfoliatum | H | FACW+ | 10% | Salix sp. | S | >FAC | 10% |
| Carex sp. | H | >=FAC | 20% | | | | |
| Typha latifolia | H | OBL | 10% | | | | |
| Solidago sp. | H | >=FAC | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10yr 5/1 | 10yr 6/8 | Sm, distinct 5% | Saturated silt, loam, | Many pieces of gravel (up to 2') throughout and many roots in Horizon A |
| 2-10+ | B | 2.5yr 4/3 | 5yr 4/6 | 5% small, distinct | Saturated silt, clay, loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observed _____

Stream name (if known):

_S576, unnamed tributary to Silver Creek___

Approximate distance to stream:

__300 feet_____

What watershed is the delineated wetland within?

___ SVC118_____

Comments:

_____

_____

Flow relationship to associated stream:

☒ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value, PEM wetland with moderate vegetative diversity. Existing gas well, tank and access road all within wetland. Receives surface water runoff from northwest and northeast and drains via drain D130 to the south southwest in to stream connecting to stream S576 to the south. Low groundwater recharge/discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszak | Date: June 13, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC118-W131<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Glyceria striata | H | OBL | 25% | | | | |
| Impatiens capensis | H | FACW | 45% | | | | |
| Equisetum arvense | H | FACW | 15% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches<br>Depth to free water in pit: NA inches<br>Depth to saturated soil: NA inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☐<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10yr 3/1 | 2.5yr 4/6 | 10%, small, distinct | Moist silt clay, loam with ~30% PDOM | |
| | | | | | Rock refusal at 8' | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (Fe, few)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation_____

Stream name (if known):

_S576 (unnamed tributary to Silver Creek)___

Approximate distance to stream:

__300 feet_____

What watershed is the delineated wetland within?

___SVC118_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☒ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PEM wetland with little vegetative diversity, associated with logging road crossing at a natural depression in an upland forest. Receives surface water runoff, which drains southeast via drain D131 and merges with stream S132 at access road crossing. Continues south to wetland W576 and stream S576, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszak | Date: June 13, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC118-W132<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Impatiens capensis | H | FACW | 20% | | | | |
| Onoclea sensibilis | H | FACW | 15% | | | | |
| Osmunda cinnamomea | H | FACW | 20% | | | | |
| Carex crinita | H | OBL | 15% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 0-6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10yr 2/1 | 2.5yr 6/6 | 5%, small, distinct | Very moist silt clay, loam | |
| | | | | | Rock refusal at 8' | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (Fe, few)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Current observed conditions _____

Stream name (if known):

_ S132, unnamed tributary to Silver Creek___

Approximate distance to stream:

__Abutting_____

What watershed is the delineated wetland within?

___ SVC118_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: __Riparian_____

**Rationale/Remarks:**

**Small, moderate value, riparian PEM with low vegetative diversity. Located within banks of stream S132. Some flood flow attenuation function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszak | Date: June 13, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC118-W133<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Veratrum viride | H | FACW+ | 50% | | | | |
| Onoclea sensibilis | H | FACW | 10% | | | | |
| Carex sp. | H | >=FAC | 15% | | | | |
| Fraxinus pennsylvanica | T | FACW | 15% | | | | |
| Acer rubrum | T | FACW+ | 10% | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches<br>Depth to free water in pit: NA inches<br>Depth to saturated soil: 0-6 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☐<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Wetland is abutting associated stream reach S576 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10yr 3/1 | - | - | Very moist silt loam with ~30% PDOM |
| 6-14 | B | 10yr6/1 | 5yr 4/6 | 30% small, distinct | Slightly moist clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor (Slight)
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (Mg, large)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation_____

_____

Stream name (if known):

_S576, unnamed tributary to Silver Creek___

Approximate distance to stream:

__10 feet_____

What watershed is the delineated wetland within?

___ SVC118_____

Comments:

_____

_____

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, low value PFO, typified by pit and mound topography, with little vegetative diversity. Receives surface water runoff and drains north into stream S576 near wetland W133-17, -18, -19. Road culvert east of W133-5 and -6 doesn't appear to have hydrologic influence as it is 8-10" above wetland grade and is partially filled with soil. Low groundwater discharge/recharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Kielaszak | Date: June 13, 2008<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: SVC204-W134<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex crinita* | H | FACW | 25% | | | | |
| *Eupatorium maculatum* | H | FACW | 15% | | | | |
| *Viburnum recognitum* | S | FACW | 10% | | | | |
| *Cornus amomum* | S | FACW | 20% | | | | |
| *Onoclea sensibilis* | H | FACW | 25% | | | | |
| *Ulmus americana* | T | FACW- | 5% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: NA inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: NA inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 0-6 inches (very moist) | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Datapoint was taken in upgradient portion of seasonal RPW stream channel to

determine upper context of wetland boundary. Soils were borderline saturated/very moist and presence of mottles suggest wetland hydrology criteria is met for a sufficient period of time.

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**
Taxonomy (subgroup) **Aquic Dystrochrepts**

Drainage Class **Moderately well drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-13 | A | 10yr 2/2 | 2.5yr 2.5/4 | 30% small, faint | Slightly moist, silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field Observation_____
Stream name (if known):
_S577, unnamed tributary to Silver Creek___
Approximate distance to stream: ___ _200 feet_____
What watershed is the delineated wetland within?
___SVC204_____
Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value, PSS wetland with low vegetative diversity, adjacent to forested area. Receives surface runoff from upgradient areas (including portions that extends north into forested area (W134-12 to W134-17) and drains east to culvert into wetland W577 (at W577-1f and W577-1g) during high rain events and reaches stream S577 an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: SVC117-W565<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | *Salix species* | T | ≥ FAC | 10 |
| *Phalaris arundinacea* | H | FACW+ | 20 | *Ulmus americana* | T | FACW- | 5 |
| *Typha latifolia* | H | OBL | 15 | *Verbena hastata* | H | FACW+ | 5 |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Equisetum arvense* | H | FAC | 10 | | | | |
| *Viburnum recognitum* | S | FACW- | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 2.5Y 2.5/1 | --- | --- | Saturated silt clay |
| 10-16+ | B | 2.5Y 6/1 | 10YR 6/8 | 7%, small streaks, distinct | Sandy (fine) clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

S1520, Unnamed tributary to Silver Creek

Approximate distance to stream:

700 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC117

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Unknown connection (at time of field visit); assumed perennial surface flow to unnamed tributary to Silver Creek

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, high value PEM/PFO wetland, with moderate vegetative diversity, located east of T57, mostly outside of survey corridor. Surrounded by upland forest (standing pool of water in center) to north, east, and southeast. High value/functions of groundwater recharge/discharge, wildlife habitat, and possibly nutrient retention from runoff of pasture to west. Receives surface sheet flow from northwest and drainage runoff from drain D565 though a cut in berm south of pond PO565. Discharge is to the east into an unnamed tributary to Silver Creek outside the survey corridor.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Energy<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC116-W566<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/1 | --- | --- | Saturated silt clay with high peat/organic content | |
| 5-10+ | B | 10YR 6/1 | 10YR 6/8 | 10%, small, distinct | Saturated clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S1520, Unnamed tributary to Silver Creek

Approximate distance to stream:

600 meters

What watershed is the delineated wetland within?

SVC116

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland, with little vegetative diversity, located in an inundated depression. 95% water, 5% vegetation. Inflow via discrete runoff from cow pastures to west. Outflow via drain that ends 30 feet east of wetland, on level ground. No connection to traditional navigable waters observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC112-W573<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Ulmus americana* | T | FACW- | 20 | | | | |
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Impatiens capensis* | H | FACW | 20 | | | | |
| *Erythronium americanum* | H | FACU | 5 | | | | |
| *Acer saccharum* | H | FACU- | 5 | | | | |
| *Cardamine diphylla* | H | FACU* | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In some areas | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: After rain event in previous 24 hours

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-1 | O | - | - | - | Organic/partially decomposed organic matter |
| 1-4 | A | 2.5Y 2.5/1 | --- | --- | Silt with high peat content |
| 4-8+ | B | 2.5Y 4/2 | 2.5Y 5/3 | Common, large, 45% | Silt clay loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation

Stream name (if known):

S128, Unnamed tributary to Silver creek, outside of survey corridor

Approximate distance to stream:

0.2 miles

What watershed is the delineated wetland within?

Silver Creek 112

Comments:

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: NONE, Isolated

**Rationale/Remarks:**

**Small, low value depressional PFO wetland with low vegetative diversity that continues outside survey corridor to the north for approximately 100 feet. Inflow via surface water runoff from adjacent up-gradient area. Outflow to pit and mound topography outside the survey corridor. No surface water connection observed beyond survey corridor.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC118-W574/574A<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Glyceria striata* | H | OBL | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks: Mostly open water

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-3 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area and logging ruts hold water, creating saturated conditions | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | A | 10YR 3/1 | --- | --- | Saturated silt clay |
| 3-12 | B | 10YR 4/2 | 10YR 5/8 | 40%, small, distinct | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation

Stream name (if known):

S576, (Unnamed tributary to SIlver Creek)

Approximate distance to stream:

65 meters

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC118

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value inundated depressional wetland with very little vegetation that is located on the collection centerline. Receives discrete runoff inflow from northwest –sloping topography. No outflow observed. W574 is natural depression. W574a occurs 3 feet northwest, separated by upland vegetation, but likely drains to W574 during heavy rainfall.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forest<br>Transect ID: SVC118-W575<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Carex* sp. | H | ≥FAC | 15 | | | | |
| *Fraxinus pennsylvanica* | H | FACW | 10 | | | | |
| *Acer saccharum* | H | FACU- | 10 | | | | |
| *Equisetum arvense* | H | FAC | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ 50% of area | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☒ few | Local Soil Survey: ☐ |
| Depth to free water in pit: 1 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Saturated water is turbid, inundated water is clear

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0- | A | 2.5Y 3/1 | 10YR 5/3 | 10%, few, faint | Silt |
| 5-7 | B | 2.5Y 5/3 | 10YR 4/6 | 15%, few, faint | Silt loam |
| 7+ | Rock layer | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S576 (An unnamed tributary of Silver Creek)

Approximate distance to stream:

120 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC118

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☐ **discrete and confined**
- ☒ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Series of depressional PEM areas and old logging roads located in a forested area. Wetland has moderate to low value and vegetative diversity. Receives inflow is from surrounding areas of higher elevation. Outflow is to unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC118-W576A, W576B, W576C, and W576D<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Urtica* sp. | H | FACU | 5 | *Cardamine diphylla* | H | FACU* | 5 |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Carex* sp. | H | ≥ FAC | 10 | | | | |
| *Carex crinita* | H | OBL | 5 | | | | |
| *Fraxinus pennsylvanica* | H | FACW | 5 | | | | |
| *Polygonum* sp. | H | unknown | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 57%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 10 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☐<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Slightly saturated

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12+ | A | 2.5Y 2.5/1 | 10YR 3/6 | Few, faint, 1% | Silt loam, lots of roots in soil | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

field observation

Stream name (if known):

S576, Unnamed tributary to Silver Creek

Approximate distance to stream:

Riparian

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC 118

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Wetland is moderate PEM in forest. Wetland is in valley along stream. Inflow is from associated stream and surrounding areas of higher elevation. Outflow is to stream. Diversity is moderate to low. Wildlife value is moderate to low. Wetland is 4 small wetlands connected along stream S576, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: SVC204-W577<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 10 | *Polygonum species* | H | ≥FAC | 5 |
| *Impatiens capensis* | H | FACW | 20 | *Fraxinus pennsylvanica* | H | FACW | 2 |
| *Onoclea sensibilis* | H | FACW | 10 | *Senecio aureus* | H | FACW | 10 |
| *Equisetum arvense* | H | FAC | 5 | *Solidago species* | H | ≥FAC | 2 |
| *Carex* sp. | H | ≥FAC | 15 | *Salix species* | S | ≥FAC | 5 |
| *Toxicodendron radicans* | H | FAC | 10 | *Viburnum recognitum* | S | FACW- | 5 |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☒ Other: film in pit<br>☐ Oil Sheen present | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: N/A inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 7 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/2 | At 11 inches: 7.5YR 3/4 | Few, small, 3% | Silt loam | Some roots in upper 7 inches |
| 12-14+ | B | 10YR 3/1 | 7.5YR 2.5/3 | Few, small, 10% | Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation

Stream name (if known):

S577 (Unnamed tributary to Silver Creek)

Approximate distance to stream:

Riparian

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC204

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large to moderate size, moderate value PEM/PSS wetland with high vegetative diversity. Area is slightly depressional, located between agricultural field with apple trees (south, east, west) and forest (north). Inflow from numerous ditches, groundwater, runoff from surrounding areas with higher elevation. Outflow to ditches and streams.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☐ Yes ☒ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Poorly drained soils due to compaction | Community ID: PEM/PSS<br>Transect ID: SVC204-W578<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Solidago rugosa* | H | FAC | 5 | *Taraxacum officinale* | H | FACU- | 15 |
| *Salix* sp. | H | ≥ FAC | 5 | *Trifolium pratens* | H | FACU- | 15 |
| *Carex* sp. | H | ≥ FAC | 20 | *Ranunculus repens* | H | FAC | 5 |
| *Senecio aureus* | H | FACW | 20 | | | | |
| *Viburnum recognitum* | S | FACW- | 10 | | | | |
| *Viola affinis* | H | FACW | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 78%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 to 2 inches<br>Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Herbaceous upland vegetation growing atop small, numerous pasture hummocks surrounded by interlaced small drainages | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 2/1 | 10YR 4/3 | 5%, small, faint | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation

Stream name (if known):

Unnamed tributary to Silver Creek (S577)

Approximate distance to stream:

250 feet

What watershed is the delineated wetland within?

SVC204

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, low value PEM/PSS wetland with moderate vegetative diversity; located on north sloping hillside in cow pasture. Small hummocks created by cattle. Drains north down hillside via discrete flow into wetland W577 and then to stream S577. Also, channelized outflow outside of survey corridor connects W578 to W 577 and then to S577.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/16/08<br>County: Chautauqua<br>State: NY Sector E |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC204-W579<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex* sp. | H | ≥ FAC | 60 | | | | |
| *Juncus effusus* | H | FACW+ | 2 | | | | |
| *Solidago graminifolia* | H | FAC | 5 | | | | |
| *Viburnum recognitum* | S | FACW- | 10 | | | | |
| *Solidago rugosa* | H | FAC | 5 | | | | |
| *Rosa multiflora* | S | FACU | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ 50%<br>Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Water Marks: ☐ on<br>Drift Lines: ☐ | Sediment Deposits: ☐<br>Drainage Patterns: ☒ |
| Depth of inundation: up to 5 inches<br>Depth to free water in pit: None inches<br>Depth to saturated soil: 7 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 2.5Y 3/1 | --- | --- | Silt loam | Lots of roots in A layer |
| 6-12+ | B | 2.5Y 5/1 | 2.5Y 6/4<br>10YR 6/8 | Large, common 45%<br>Small, common, 5% | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Magnesium concretions

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S577, Unnamed tributary to Silver Creek

Approximate distance to stream:

700 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC204

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large to moderate size, low value depressional PEM wetland, with moderate vegetative diversity, located in a cow pasture. Inflow from drain D579 and small surface runoff from field to south. Outflow to north at D579. Ultimately reaching an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: SVC204-W580<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | *Typha* sp. | H | OBL | 10 |
| *Carex crinita* | H | OBL | 15 | | | | |
| *Carex* sp. | H | ≥ FAC | 15 | | | | |
| *Acer rubrum* | S | FAC | 15 | | | | |
| *Viburnum recognitum* | S | FACW- | 15 | | | | |
| *Salix* sp. | S | ≥ FAC | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: N/A inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: N/A inches<br>Depth to saturated soil: N/A inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area collects runoff and holds water, supporting long term saturated conditions | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/1 | 5YR 4/6 | 5%, small distinct | Saturated silt loam |
| 8-12+ | B | 10YR 5/1 | 10YR 5/8 | 5%, small, distinct | Slightly moist silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Channel size, water flow

Stream name (if known):

Unnamed tributary to Silver Creek (S577)

Approximate distance to stream:

300 feet

What watershed is the delineated wetland within?

SVC204

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate, low value inundated depressional PEM/PSS wetland with moderate vegetative diversity. Located in a cow pasture. Inflow from west via drain D580a. Outflow north via D580, which turns to discrete flow and reaches wetland W577, which drains to S577, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC204-W581<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 5 | *Solidago rugosa* | H | FAC | 2 |
| *Onoclea sensibilis* | H | FACW | 2 | *Agrostis stolonifera* | H | FACW | 15 |
| *Viburnum recognitum* | S | FACW- | 5 | *Phalaris arundinacea* | H | FACW | 5 |
| *Carex* sp. | H | ≥ FAC | 5 | *Trifolium* sp. | H | FACU | 5 |
| *Salix* sp. | S | ≥ FAC | 5 | | | | |
| *Rosa multiflora* | S | FACU | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ 30%<br>Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present _slight_____ | Water Marks: ☐<br>on<br>Drift Lines: ☐ | Sediment Deposits: ☐<br>Drainage Patterns: ☒ |
| Depth of inundation: up to 3 inches<br>Depth to free water in pit: 8 inches<br>Depth to saturated soil: 7 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9 | A | 2.5Y 3/1 | --- | --- | Silt loam | Lots of roots present |
| 9-10+ | B | 10YR 6/8 | 2.5Y 6/3 | 40%, common, prominent | Clay loam | Very hard B layer |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Lots of roots at 10 inches

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation

Stream name (if known):

S577, Unnamed tributary to Silver Creek

Approximate distance to stream:

30 feet

What watershed is the delineated wetland within?

SVC204

Comments:

Drains to culvert that drains to S577

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with moderate vegetative diversity, located in a cow pasture. Many small depressions filled with water formed by cow treads. Inflow from drain D580, also from areas south of higher elevation. Pasture and shrubby areas surrounding. Outflow to drain north to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC204-W582<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 30% | | | | |
| *Phalaris arundinacea* | H | FACW+ | 30% | | | | |
| *Solidago rugosa* | H | FAC | 5% | | | | |
| *Taraxacum officinale* | H | FACU- | 20% | | | | |
| *Trifolium pratens* | H | FACU- | 14% | | | | |
| *Carex* sp. | H | >FAC | 1% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-1 inches<br>Depth to free water in pit: 4 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒ few<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Numerous indentations in soil where cattle tread, showing soft, saturated conditions | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chautauqua Silt Loam**

Drainage Class **Moderately well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aquic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 4/1 | 10YR 6/8 | 10%, large, distinct | Saturated silt clay | |
| Rock refusal beyond 8 inches | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Desktop review_

Stream name (if known):

_S577, (Unnamed tributary to Silver Creek)_

Approximate distance to stream:

_300 meters_

**Watershed Relationship**

What watershed is the delineated wetland within?

_SVC204_

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_Physically located within SVC 124, however, actually drains to SVC204_

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, low value PEM wetland with low vegetative diversity. Located within an active cow pasture. Some dominant vegetation is upland vegetation, but overall hydrology, soils, and vegetation are strong enough indicators of wetland. Agricultural drain (D582) is dug through wetland W582, and provides outflow northeast to stream S577 which is actually in the Silver Creek 204 watershed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/16/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC76-W583<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Impatiens capensis* | H | FACW | 30 | *Tsuga Canadensis* | S | FACU | 5 |
| *Cardamine diphylla* | H | FACU* | 15 | *Fraxinus pennsylvanica* | H | FACW | 5 |
| *Onoclea sensibilis* | H | FACW | 5 | *Galium* sp. | H | unknown | 5 |
| *Osmunda cinnamomea* | H | FACW | 5 | *Carex* sp. | H | ≥ FAC | 2 |
| *Rubus* sp. | H | ≥ FAC | 10 | | | | |
| *Tiarella cordifolia* | H | FAC- | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 70%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-1 | O1 | | | | Organic/partially decomposed organic matter | |
| 1-5 | O2 | | | | Silt and more than 50% partially decomposed organic matter | |
| 5-7 | A | 10YR 3/1 | --- | --- | Silt with 20% partially decomposed organic matter | |
| 7-10+ | B | 10YR 2/1 | Gley1 6/5G | Large, common, 45%, hard | Silt with gley concretions | Rocky at 10 inches |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S583, an unnamed tributary to Silver Creek

Approximate distance to stream:

Riparian

**Watershed Relationship**

What watershed is the delineated wetland within?

Silver Creek 76

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**
☐ **confined** ☒ **overland sheet flow**
☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PEM wetland with moderate vegetative diversity, located in a hemlock forest, valley. Inflow from groundwater seeps in hillside and runoff from higher elevation. Outflow to stream S583, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/17/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: SVC76-W584<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Osmunda cinnamomea* | H | FACW | 10 | | | | |
| *Betula alleghaniensis* | T | FAC | 10 | | | | |
| *Acer saccharum* | T | FACU- | 10 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks: *Betula* and *Acer* trees on hummocks

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional peaty bog with floating surface layer of silt and organic debris | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | --- | --- | --- | Highly decomposed organic matter |
| 0-8 | A | 10YR 3/1 | --- | --- | Saturated silt with high peat content |
| 8+ | B | 5Y 6/1 | 5Y 5/6 | 5%, small, distinct | Moist silt clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S583, (Unnamed tributary to Silver Creek )

Approximate distance to stream:

100 meters

What watershed is the delineated wetland within?

Silver Creek 76

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, and value depressional PEM/PFO wetland, with moderate vegetative diversity. Wetland is comprised of 8 inches of highly decomposed organic matter atop mucky water. Moderate stream recharge value. Receives inflow via groundwater and hillside discrete flow from south. Drains via confined channel north (down-gradient) to other wetland features (out of corridor) and then to stream S583, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/17/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO 1/4<br>Transect ID: SVC76-W585<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Osmunda cinnamomea* | H | FACW | 5 | *Tsuga canadensis* | S/T | FACU | 5 |
| *Betula alleghaniensis* | S/T | FAC | 2 | | | | |
| *Lindera benzoin* | S | FACW- | 5 | | | | |
| *Ulmus americana* | S | FACW- | 2 | | | | |
| *Carex* sp. | H | ≥FAC | 2 | | | | |
| *Iris* sp. | H | ≥ FAC | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks: Lots of thick moss layers (3 inches or more) on banks, hummocks. Wetland is mostly unvegetated.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☒ on Leaves, sticks | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: up to 8 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Water is clear but slightly brownish

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-3 | O | | | | Partially decomposed organic matter, peaty | |
| 3-5 | A | 5Y 2.5/1 | --- | --- | Silt, very little organic | |
| 5-8+ | B | 10YR 5/2 | --- | --- | Silty clay loam, some concretions | Rocky at 8 inches |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S583 (Unnamed tributary to Silver Creek)

Approximate distance to stream:

450 feet

What watershed is the delineated wetland within?

SVC76

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: None, Isolated

**Rationale/Remarks:**

**Moderate size and value, inundated, depressional PEM/ PFO ¼ wetland with low vegetative diversity, located within forested areas in hemlock/sugar maple forest. Odor of decomposing matter present. Wildlife value is moderate – no amphibians observed but many deer droppings present. Inflow from runoff of areas of higher elevation. No outflow observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/17/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: SVC76-W586<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Impatiens capensis* | H | FACW | 10 | *Tsuga canadensis* | T | FACU | |
| *Osmunda cinnamomea* | H | FACW | 15 | *Betula alleghaniensis* | T | FAC | |
| *Carex crinita* | H | OBL | 5 | | | | |
| *Glyceria striata* | H | OBL | 5 | | | | |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Arisaema triphyllum* | H | FACW- | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 3-0 | O | | | | Saturated organic matter |
| 0-4 | A | 10YR 2/1 | --- | --- | Saturated silt with high peat content |
| 4-12 | B | 5Y 6/1 | 10YR 5/8 | 5%, small, distinct | Moist silt clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Visual Observation

Stream name (if known):

Stream S583

Approximate distance to stream:

400 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC76

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Moderate to large sized, moderate value PEM/PFO wetland with moderate vegetative diversity. PEM is the northeast half, PFO is the southeast half. Moderate wildlife value due to secluded forest area (lots of scat observed). Depressional area that receives groundwater. Based on review of aerial photography, W586 drains northwest out of survey corridor to stream S583, an unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/17/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO<br>Transect ID: SVC116-W587<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Veratrum viride* | H | FACW+ | 15 | *Glyceria striata* | H | OBL | 10 |
| *Senecio aureus* | H | FACW | 10 | *Erythronium americanum* | H | FACU | 2 |
| *Equisetum arvense* | H | FAC | 2 | *Ulmus americana* | S/T | FACW- | 5 |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Fraxinus pennsylvanica* | H | FACW | 5 | | | | |
| *Acer saccharum* | T | FACU- | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 78%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ 25% | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: up to 1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 1 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | O | | | | Partially decomposed organic matter |
| 3-4 | A | 5Y 2.5/1 | --- | --- | Silt loam with 20% organic matter |
| 4-10+ | B | 2.5Y 5/2 | 7.5YR 4/6 | 30%, medium common | Sandy silt y loam |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Topographic Review

Stream name (if known):

S1520, Unnamed tributary to Silver Creek

Approximate distance to stream:

300 feet

What watershed is the delineated wetland within?

SVC116

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: No flow

**Rationale/Remarks:**

Moderate size and value, depressional PEM/PFO wetland with forested hummocks in sugar maple forest, with moderate vegetative diversity. Inflow from higher elevation surroundings. No outflow observed.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/17/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☐ Yes ☒ No<br>Is the site significantly disturbed (atypical situation)? ☒ Yes ☐ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: In cow pasture | Community ID: PEM<br>Transect ID: SVC204-W588<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 5 | | | | |
| *Salix sp.* | S | ≥ FAC | 2 | | | | |
| *Impatiens capensis* | H | FACW | 2 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-6 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 7 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Many tadpoles in open water area

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 5Y 2.5/2 | --- | --- | Silt loam | |
| 6-12+ | B | 10YR 4/1 | 10YR 5/2 | 5%, small, faint | Clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation and desktop review

Stream name (if known):

S577, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

160 meters

What watershed is the delineated wetland within?

SVC204

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low to moderate value PEM wetland with little vegetative diversity, located in cow pasture. Wetland high disturbed by cows. Inflow from surrounding area of higher elevation. Outflow to drain D588 which ends a short distance from wetland. No surface flow path to stream S577 observed.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC124-W589<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Glyceria striata* | H | OBL | 15 | | | | |
| *Senecio aureus* | H | FACW | 15 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches (at surface)<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/1 | --- | --- | Saturated silt (some clay) |
| 8-12 | B | 2.5Y 4/1 | 10YR 6/8 | 5%, small, distinct | Saturated silt (some clay) |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation

Stream name (if known):

S591, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

100 meters

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC124

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Moderate size, low value PEM wetland, with little vegetative diversity, located in a forested area. Receives inflow via discrete flow from north sloping forest, and from drain D590 (outflow from wetland W590 to south). Outflow via channelized runoff to the north, out of corridor, eventually reaching stream S591, an unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC124-W590<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 50 | | | | |
| *Onoclea sensibilis* | H | FACW | 50 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: Mostly open water, very little vegetation

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒<br>Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Water Marks: ☐<br>on<br>Drift Lines: ☐ | Sediment Deposits: ☐<br>Drainage Patterns: ☐ |
| Depth of inundation: 6 inches<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☐<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area holds water, supporting long term saturation | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/1 | --- | --- | Saturated silt loam |
| 8-12 | B | 10YR 5/1 | 10YR 6/8 | 10%, large, distinct | Saturated silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Flow observation

Stream name (if known):

S591, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

120 meters

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC124

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach:

- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Small, low value open water depressional PEM with approximately 10% vegetative cover. Collects rainfall/surface runoff due to depressional character. Outflow via drain D590 to north, which drains to wetland W589 and stream S591, an unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS/PFO<br>Transect ID: SVC124-W591<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | | *Solidago rugosa* | H | FAC | |
| *Onoclea sensibilis* | H | FACW | | *Agrostis stolonifera* | H | FACW | |
| *Viburnum recognitum* | S | FACW- | | *Equisetum arvense* | H | FAC | |
| *Phalaris arundinacea* | H | FACW | | *Carex* sp. | H | ≥FAC | |
| *Impatiens capensis* | H | FACW | | *Salix discolor* | S | FACW | |
| *Solidago gigantea* | H | FACW | | *Salix fragilis* | S | FAC+ | |
| | | | | *Senecio aureus* | H | FACW | |
| | | | | *Fraxinus pennsylvanica* | T | FACW | |
| | | | | *Rosa multiflora* | S | FACU | |
| | | | | *Malus* sp. | T/S | ≤FAC | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 94%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14+ | A | 10YR 4/1 | 7.5YR 5/8 | 5%, varying size, distinct | Saturated soil, silt loam | Many oxidized roots channels in upper reaches; lighter concretions at 12 inches |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Observation_____

Stream name (if known):

_S591, (Unnamed tributary to Silver Creek)___

Approximate distance to stream:

_Riparian_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_SVC124_____

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_Stream flows through northern section of wetland_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

Very large, high value PEM/PSS/PFO wetland, whose vegetated communities are intermixed and not well segmented. High vegetative diversity and toxicant retention value (down gradient from cow pasture), high wildlife value. Inflow via stream S591 from south and via discrete surface flow. Outflow via S591, an unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC124-W592<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Carex species* | H | > FAC | 25 | | | | |
| *Solidago rugosa* | H | FAC | 15 | | | | |
| *Salix discolor* | S | FACW | 15 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: *Carex* eaten by cows

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Riparian to Stream S592 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Alden mucky silt loam**

Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10+ | A | 10YR 2/1 | 10YR 6/8 | 15%, small, distinct | Saturated silt loam with few iron concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S592, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

Riparian

What watershed is the delineated wetland within?

SVC124

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Moderate size, low value PEM wetland with low vegetative diversity, located in a cow pasture. Some pollutant retention value. Occurs along channel of stream S592, which provides culverted inflow on west end. Outflow east via stream S592, an unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/19/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC124-W593<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Eupatorium leucolepis* | H | FACW+ | 5 | | | | |
| *Agrostis stolonifera* | H | FACW | 15 | | | | |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: *Eupatorium* may be endangered species

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Riparian to Stream S592 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Alden mucky silt loam**

Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10+ | A | 10YR 2/1 | 5YR 4/6 | 15%, small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation

Stream name (if known):

S592, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

Riparian

What watershed is the delineated wetland within?

SVC124

Comments:

Stream 592 is mapped as stream S591 within the same watershed within another section of survey corridor.

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

Moderate size, low value PEM wetland within channel of stream S592, within cow pasture. Some pollutant retention value. Inflow via stream S592 from west. Outflow via stream S592 to east to wetland W592. If farm road did not exist, wetlands W592 and W593 would be same wetland.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/19/08<br>County: Chautauqua<br>State: NY Sector E Road 24 north of Hurlburt Road |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC122-W594<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 25 | | | | |
| *Mentha aquatica* | H | OBL | 25 | | | | |
| *Ranunculus repens* | H | FAC | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: inches<br>Depth to saturated soil: inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/1 | 5YR 4/6 | 2%, small, distinct | Saturated silt loam | |
| 8-10 | B | 10YR 6/1 | 10YR 6/8 | 30%, large, distinct | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach:
- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation

Stream name (if known):

S594, an unnamed tributary to Silver Creek

Approximate distance to stream:

Abutting

What watershed is the delineated wetland within?

Flows to SVC122, however the wetland is located within both SVC122 and SVC124

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Moderate size, low value PEM wetland, located in a cow pasture. Inflow is not immediately evident. Groundwater seep may exist east of Road 24 centerline. Outflow east out of corridor via channelized flow S594, to an unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, B. Smith | Date: 5/21/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC117-W605<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Juncus effusus | H | FACW | 50 | | | | |
| Carex sp. | H | ≥FAC | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Busti Silt Loam** Drainage Class **Somewhat poorly drained**

Taxonomy (subgroup) **Aeric Haplaquepts** Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10+ | A | 10yr 2/1 | 10yr 6/8 | 15% small, distinct | Saturated silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions (Fe, few)
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation__

Stream name (if known):

__S1520 (Unnamed tributary to Silver Creek)_____

Approximate distance to stream:

_ 340 meters_____

What watershed is the delineated wetland within?

__SVC117_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PEM wetland with low vegetative diversity, located within an active cow pasture. Inflow via discrete surface flow from west over gently sloping topography. Outflow via discrete surface flow to east. Outflow likely reaches drain D565 to wetland W565 before dissipating into groundwater given the slope of the land and close proximity to W565. Based on aerial/topographic map review, outflow then flows outside of the survey corridor, reentering the survey corridor as S1520 (an unnamed tributary to Silver Creek) to the east.**

**FEATURE ID : SVC118-S132_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 6/13/08

State: NY

Observers: A. Francisco, A. Kielazek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _____SVC118_____

Stream Flow Direction ___South_____

Width (ft) (water's edge to water's edge) ____2-3_____

Width (ft) (bank to bank) _____3-4_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC118-S132_____**

| Bank Height and Slope | | | Associated Habitat |
|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ 0-3 ft. | If yes, list: Impatiens capensis, Carex sp. |
| ☐ | 3-6 ft. | ☐ 3-6 ft. | Approximate Riparian Width (facing d.s.) 6-8 ft left bank |
| ☐ | 6+ ft. | ☐ 6+ ft. | 6-8 ft right bank |
| | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: __ _____ | | | If yes, list: |
| Left Bank* | | Right Bank* | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | If yes, list: W132 |
| ☐ | 0 -20% (0-11°) | ☐ | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | If yes, list: Water striders |
| ☐ | 51 -100% + (38-45°) | ☐ | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☒ | 100% + (46°+) | ☒ | If yes, list: Frogs |
| Evidence of Pollution? _____NO_____ | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _____NO_____ | | | If yes, list: |
| Evidence of Erosion? _____Yes_____ | | | Comments: |
| Description of Erosion: _____Minor scour and down cutting _____ | | | |

Comments:

S-RPW flowing southeast though uplands forest (Wetland W132 is approximately 100 feet upstream of proposed road crossing). Drain D130 and stream S132 meet approximately 20' upstream of road crossing and point where SD132 was recorded. Channel at road crossing is 3-5' in width. Stream S132 flows south from road crossing into W576 and S576 approximately 60 feet down gradient.

**FEATURE ID : SVC118-S576**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/15/08

State: NY

Observers: H. Childs, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: gentle meanders

Tributary is: Natural ☒ Manipulated ☐

Watershed: Silver Creek 118

Stream Flow Direction Southeast

Width (ft) (water's edge to water's edge) 2-6

Width (ft) (bank to bank) 2-8

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☒ Sand
- ☐ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☒ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC118-S576**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: Impatiens capensis, *Polygonum species*, *Carex crinita*, Nettle species |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 0 ft left bank |
| | | | | 4 ft right bank |
| *Direction when facing downstream: Southeast | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W576 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: minnows |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☒ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Runs and pools | | | | If yes, list: |
| Evidence of Erosion? Yes | | | | |
| Description of Erosion: Undercut banks, exposed roots | | | | |

Comments:

Stream S576 flows across corridor loosely west to east. Banks steep in some places but very flat in others. Riparian wetland W576 corridor is small to moderate in size. Water is clear.

**FEATURE ID : SVC204-S577**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/15/08

State: NY

Observers: H. Childs, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: gentle meanders

Tributary is: Natural ☒ Manipulated ☐

Watershed: Silver Creek 204

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 2-15

Width (ft) (bank to bank) 4-16

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC204-S577**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Polygonum* sp., *Veratrum viride* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 0-4 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 0 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: East | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W577 |
| ☐ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☒ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? Yes | | | | |
| Description of Erosion: Exposed roots, very steep banks | | | | |

Comments:

Stream is surrounded by a sugar maple forest to the N, E and W, about 75 feet to the south vegetation changes to shrub scrub on the edge of an agricultural field. Surrounding stream banks have sugar maple saplings. Diversity very low, wildlife value low. Stream splits into two tributaries (both with flow present) which have multiple drains. Tributaries come back together 100 feet from the split.

**FEATURE ID: SVC76-S583**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/16/08

State: NY

Observers: H. Childs, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: slight meanders

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC76

Stream Flow Direction Northeast

Width (ft) (water's edge to water's edge) 4-5

Width (ft) (bank to bank) 5-6

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☒ Sand
- ☒ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID: SVC76-S583**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Impatiens capensis*, *Fraxinus pennsylvanica* seedlings |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 1 ft left bank<br>1 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: Northeast | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W581 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☒ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? No | | | | |
| Description of Erosion: | | | | |

Comments:

Stream meanders through hemlock and sugar maple forest. Many fallen trees and branches in stream with lots of leaves and small sticks caught on them. Banks have leafy debris but little understory/herbaceous growth. Some small drains leading to stream. Running water is clear.

**FEATURE ID : SVC124-S591**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/16/08

State: NY

Observers: H. Childs, B. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: sharp meanders

Tributary is: Natural ☒ Manipulated ☐

Watershed: Silver Creek 24

Stream Flow Direction Northeast

Width (ft) (water's edge to water's edge) 1-4

Width (ft) (bank to bank) 1-5

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other vegetation

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC124-S591**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: Northeast

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☐ | 0 -20% (0-11°) | ☐ |
| ☒ | 21 – 50% (12-27°) | ☒ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? Some algae growth
Presence of Riffle/Run/Pools? Yes to all
Evidence of Erosion? Minor
Description of Erosion: Visible roots

## Associated Habitat

Riparian Vegetation ☐ Yes ☒ No
If yes, list:

Approximate Riparian Width (facing d.s.) 0 ft left bank
0 ft right bank

Aquatic Vegetation ☐ Yes ☒ No
If yes, list:

Associated Wetland ☒ Yes ☐ No
If yes, list: Wetland W591

Aquatic Organisms ☐ Yes ☒ No
If yes, list:

Riparian/Terrestrial Organisms ☐ Yes ☒ No
If yes, list:

T&E Species ☐ Yes ☒ No
If yes, list:

Comments:
Stream S591 meanders through cow pasture and fruit trees to west. Stream has low habitat value. Bottom vegetated in most areas, except where crosses centerline.

**FEATURE ID: SVC124-S592**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/19/08

State: NY

Observers: H. Childs, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: curves from road to the east with some small bends

Tributary is: Natural ☒ Manipulated ☐

Watershed: Silver Creek 24

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 3-6

Width (ft) (bank to bank) 7-9

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID: SVC124-S592**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Phalaris arundinacea* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) ft left bank<br>ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: Northeast | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W592, W593 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| | | | | Tadpoles, snails |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? Yes – green growth on surface | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? No | | | | |
| Description of Erosion: | | | | |

Comments:

Stream S592 flows from culvert under Hurlburt Road outside of survey corridor northeast though wetland W593. It then passes through a culvert under an active farm road and flows east through wetland W592. Stream is in active pastures in a gently rolling terrain. Bed is muddy within survey corridor, with some small gravel in W592.

**FEATURE ID : SVC124-S592A .**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/19/08

State: NY

Observers: H. Childs, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: __ _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: __Silver Creek 124_____

Stream Flow Direction _____East_____

Width (ft) (water's edge to water's edge) ____0.5-1_____

Width (ft) (bank to bank) _____2-8_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC124-S592A .**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Trifolium pratense* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 0-1 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 0-1 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: Northeast | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W592, W593A |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Cattle |
| Evidence of Pollution? In an active cow pasture | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? no | | | | If yes, list: |
| Evidence of Erosion? no | | | | Comments: |
| Description of Erosion: | | | | |

Comments:
S592A flows east through W593A before joining and providing inflow to S592. It occurs in an active cow pasture.

**FEATURE ID: SVC122-S594**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/19/08

State: NY

Observers: H. Childs, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description:

Tributary is: Natural ☒ Manipulated ☐

Watershed: Silver Creek 24

Stream Flow Direction Northeast

Width (ft) (water's edge to water's edge) 1-2

Width (ft) (bank to bank) 4-5

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

Cobble

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

Small stream entering corridor at southern boundary

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID: SVC122-S594**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☐ | 0-3 ft. |
| ☐ | 3-6 ft. | ☒ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: Northeast

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☐ |
| ☐ | 21 – 50% (12-27°) | ☒ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? No

Presence of Riffle/Run/Pools? Yes

Evidence of Erosion? Yes

Description of Erosion: Large amounts of scouring to the south

## Associated Habitat

Riparian Vegetation ☐ Yes ☒ No

If yes, list:

Approximate Riparian Width (facing d.s.) ft left bank
ft right bank

Aquatic Vegetation ☐ Yes ☒ No

If yes, list:

Associated Wetland ☒ Yes ☐ No

If yes, list: Wetland W594

Aquatic Organisms ☐ Yes ☒ No

If yes, list:

Riparian/Terrestrial Organisms ☐ Yes ☒ No

If yes, list:

T&E Species ☐ Yes ☒ No

If yes, list:

Comments:

Stream S594 flowing from culvert under Hurlburt Road northeast to wetland W594. Two to three feet of scouring in south end near culvert along sloping terrain. Becomes less gravelly and no scour apparent in field near W594. Flows through active pasture into a wetland to the east of survey corridor.

Sector E

Cluster 26

Wetland Datasheets

W568

Stream Datasheets

S568, S1526

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz, R. Dutton | Date: 05/13/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS with riparian trees<br>Transect ID: SVC109-W568<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Salix species* | S | ≥ FAC | 20 | *Impatiens capensis* | H | FACW | 20 |
| *Solidago graminifolia* | H | FAC | 10 | *Equisetum hyemale* | H | FACW | 5 |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 5 | | | | |
| *Solidago* sp. | H | ≥FAC | 10 | | | | |
| *Populus tremuloides* | T | FACU | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 88%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In some small areas | Water Marks: ☒ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: <1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9+ | A | 2.5Y 3/1 | 10YR 5/8 | Medium, common, 20% | Clayey silt, some small concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S568, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

Riparian

**Watershed Relationship**

What watershed is the delineated wetland within?

Silver Creek 109

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate to low value PEM/PSS wetland, with moderate vegetative diversity, located between agricultural fields. Wetland is riparian to Stream S568 which runs down middle. Inflow from surrounding area and outfall west of survey corridor. Outflow is to east through stream S568, an unnamed tributary to Silver Creek. Part of wetland goes briefly into forest with D568. Many Tricoptera larva in observed stream.**

**FEATURE ID : SVC109-S568**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/13/08

State: NY

Observers: J. Zoladz, R. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC109

Stream Flow Direction Southeast

Width (ft) (water's edge to water's edge) 2 to 5 feet

Width (ft) (bank to bank) 8 to 10 feet

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☒ water staining
- ☐ other:

- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : SVC109-S568**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: Salix species, Populus tremuloides |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 5 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 5 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: Southeast | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W568 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Tricoptera larvae |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? No | | | | Comments: |
| Description of Erosion: | | | | |

Comments:

Small perennial stream associated with wetland W568. Only minor flow, but drains moderate sized wetland so some flow should be present all year. Active pastureland to northeast and southwest. Cows cross streams. Changes to drain D568 short distance away. Across barbed wire fence, wide and fully vegetated.

**FEATURE ID : SVC104-S1526**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/13/08

State: NY

Observers: J. Zoladz, R. Dutton

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: slight and moderate

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC104

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 1 to 3 feet

Width (ft) (bank to bank) 4 to 10 feet

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

large cobbles

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☒ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : SVC104-S1526**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 0 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 0 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: East | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| | | | | Mayfly larvae |
| ☐ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☒ | 100% + (46°+) | ☐ | | If yes, list: dusky salamander |
| Evidence of Pollution? No, maybe cow waste | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? Yes | | | | Comments: |
| Description of Erosion: Many under cut banks, some 90° 5 foot banks | | | | |

Comments:

Stream S1526 is an intermittent, small rain water/snow melt runoff stream. Steep terrain with much erosion on both banks. Cows have access and have many crossings. Cow wastes in stream channel.

Sector E

Cluster 27

Wetland Datasheets

W541, W542, W543, W544, W545, W546, W547, W548 & W548A, W549

Stream Datasheets
S543, S1519, S1520

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC103-W541<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Barbarea vulgaris* | H | FACU | 5 | *Phalaris arundinacea* | H | FACW+ | 2 |
| *Iris* sp. | H | OBL | 2 | | | | |
| *Lysimachia nummularia* | H | OBL | 65 | | | | |
| *Viburnum recognitum* | S | FACW- | 5 | | | | |
| *Typha latifolia* | H | OBL | 5 | | | | |
| *Solidago gigantea* | H | FAC | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9 | A | 2.5Y 3/2 | 5YR 3/4 | Medium, faint, 30% | Silt loam | |
| 9-12+ | B | 5Y 3/1 | 2.5YR 3/6 | Medium, distinct, 20% | Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Some small gravel throughout. Oxidized root channels in B layer only.

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Visual observation, flow level, width

Stream name (if known):

S1519, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

250 feet

What watershed is the delineated wetland within?

Silver Creek 103

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow** could not confirm

Flow is:

☒ **discrete** ☐ **discrete and confined**

☒ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PEM wetland, with moderate to low vegetative diversity. Located south of Route 39, to the west of wetland is an old agricultural field and to the east is forested. Receives inflow from drain D541 in west. D541 outflow to east out of survey corridor. Bordered on north by roadside ditch D541A that meets with D541 outside of project corridor. Ultimately reaching an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: SVC103-W542<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 5 | | | | |
| *Lysimachia nummularia* | H | OBL | 15 | | | | |
| *Salix* sp. | S | ≥FAC | 15 | | | | |
| *Solidago gigantea* | F | FAC | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☒ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 1-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1-2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 1-2 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Depressional area at base of eastern slope | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 10YR 4/1 | --- | --- | Saturated silt loam with high organic and root content |
| 10+ | B | 10YR 5/1 | 10YR 5/8 | 10%, small and large, distinct | Moist silt loam, slightly clayey |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Visual observation

Stream name (if known):

S1519 (Unnamed tributary to Silver Creek)

Approximate distance to stream:

360 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

Silver Creek 103

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, low value PEM/PSS with moderate vegetative diversity. PSS portion occurs in southern portion of wetland. Receives inflow via hillside runoff from west. Outflow on eastern side of wetland where surface runoff collects at culvert under Brunea's driveway. Culvert outflow becomes D541 which drains east through W541 to unnamed tributary of Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC106-W543<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 60 | | | | |
| *Impatiens capensis* | H | FACW | 25 | | | | |
| *Solidago gigantea* | H | FAC | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Collamer silt loam**
Taxonomy (subgroup) **Glossaquic Hapludalfs**

Drainage Class **Moderately well drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-1 | O | - | - | - | Organic |
| 1-12+ | A | 10YR4/2 | - | - | Silt |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Concretions very small. Fibrous roots and leaf matter throughout

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
Observation

Stream name (if known):
S543, (Unnamed tributary to Silver Creek)

Approximate distance to stream:
Riparian zone

**Watershed Relationship**

What watershed is the delineated wetland within?
Silver Creek 106

Wetland is
☒ **Abutting**
☐ **Adjacent with surface connection**
☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☒ **Non-RPW**

Flow relationship to associated stream:
☒ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:
☒ **discrete** ☐ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain:

**Rationale/Remarks:**

**Wetland is moderate to large PEM wetland with low value and vegetative diversity, primarily cattails. Wetland is divided at W543-4 to W543-5 and W543-11 to W543-18 by driveway. Receives inflow is from stream S543 that comes from pond outside of the survey corridor. S543 runs down the west side of the driveway, then crosses under is east, and runs east into another stream outside of the survey corridor. Drains ultimately to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC106-W544<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 30 | | | | |
| *Impatiens capensis* | H | FACW | 30 | | | | |
| *Solidago gigantea* | H | FAC | 2 | | | | |
| *Onoclea sensibilis* | H | FACW+ | 5 | | | | |
| *Sambucus canadensis* | H | FACW- | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 2 inches<br>Depth to saturated soil: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Collamer silt loam**
Taxonomy (subgroup) **Glossaquic Hapludalfs**

Drainage Class **Moderately well drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-10 | A | 10YR 3/2 | --- | --- | Saturated silt loam |
| 10+ | B | 10YR 5/2 | 10YR 6/8 | 20%, large, distinct | Moist silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☒ **Non-RPW**

What is this based on?
Field observation

Stream name (if known):
S534, (Unnamed tributary to Silver Creek)

Approximate distance to stream:
Riparian zone

What watershed is the delineated wetland within?
Silver Creek 106

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

Small, low value wetland with moderate diversity. (P731, P732) Receives inflow via western slope runoff, roadside ditch drain D544 from south and stream S543 from southwest. Outflow northeast via S543, through wetland W543 and out of survey corridor, east to unnamed tributary to Silver Creek.

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC110-W545<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Equisetum arvense* | H | FAC | 15 | *Acer saccharum* | T | FACU- | 6 |
| *Clintonia borealis* | H | <FAC | 6 | | | | |
| *Onoclea sensibilis* | H | FACW+ | 15 | | | | |
| *Glyceria striata* | H | OBL | 15 | | | | |
| *Impatiens capensis* | H | FACW | 15 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 8 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 71%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Abutting a stream (unmapped, out of corridor) | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10YR 3/1 | --- | --- | Saturated silt loam with high organic material content | |
| 4-9 | B | 10YR 4/1 | 10YR 4/6 | 30%, small, distinct | Saturated silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S1519, Unnamed tributary to Silver Creek

Approximate distance to stream:

Riparian zone

**Watershed Relationship**

What watershed is the delineated wetland within?

Silver Creek 110

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No** (out of corridor)

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

**While S1519 is perennial downstream, the section abutting W545 is intermittent.**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate wildlife and toxicant retention value, PFO wetland with high vegetative diversity. Receives inflow from south and east from up-gradient active corn field. Outflow northwest via stream S545 (not delineated) just outside corridor. Wetland W545 abuts stream headwaters for stream S1519, and contains wetland upland trees on small hummocks. Wetland ultimately drains to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC107-W546<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex* spp. | H | ≥FAC | 40 | | | | |
| *Impatiens capensis* | H | FACW | 35 | | | | |
| *Equisetum arvense* | H | FAC | 25 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Emergent wetland surrounded by red maple forest.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☒ on leaves | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 0 inches (at surface) | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Collamer silt loam**
Taxonomy (subgroup) **Glossaquic Hapludalfs**

Drainage Class **Moderately well drained**
Field observations confirm mapped type? ☐ Yes ☒ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-3 | A | 2.5Y 3/1 | --- | --- | Sandy loam | Beyond very thin sandy silt organic layer just on surface, entire profile is sandy |
| 3-14+ | B | 2.5Y 5/3 | 5YR 5/8 | Non-distinct mottles, 15% | Fine grained sandy loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☒ High Organic Content in Surface Layer of Sandy Soils
- ☒ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
Field observation

Stream name (if known):
S1519, Unnamed tributary to Silver Creek

Approximate distance to stream:
50 meters

**Watershed Relationship**

What watershed is the delineated wetland within?
Silver Creek 107

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM with little vegetative diversity. Located north of active corn field on the downward slope of hill sloping towards stream north of survey corridor. Receives surface sheet flow from the north and discharges into a muddy channel to the north, ultimately to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton, A. Kielaszek | Date: 05/07/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC73-W547<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Equisetum arvense* | H | FAC | 15 | *Carex* spp. | H | ≥FAC | 5 |
| *Viola affinis* | H | FACW | 5 | | | | |
| *Solidago graminifolia* | H | FAC | 5 | | | | |
| *Equisetum hyemale* | H | FACW+ | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In some areas | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-1 inches<br>Depth to free water in pit: 3 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☐ | Local Soil Survey: ☐<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Chenango channery loam,**

Taxonomy (subgroup) **Typic Dystrochrepts**

Drainage Class **Well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-1 | O | --- | --- | --- | Organic | Lot of root matter in A |
| 1-7 | A | 2.5Y 3/2 | --- | --- | Sandy silt loam | |
| 7-12+ | B | 5Y 3/1 | 10YR3/6 | 20%, small, distinct | Sandy silt loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation

Stream name (if known):

S1520, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

15 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

Silver Creek 73

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☒ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**
☐ **confined** ☒ **overland sheet flow**
☐ **other**

Explain:

**Rationale/Remarks:**

**Medium size, low to moderate value PEM wetland with moderate vegetative diversity, located on slope south of farm road. Receives inflow from agricultural field to north and groundwater. Outflow to stream S1520 at south end, ultimately to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC73-W548 & W548A<br>Status: Isolated |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex* spp. | H | ≥FAC | 20 | | | | |
| *Scirpus cyperinus* | H | FACW+ | 50 | | | | |
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In some areas | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1 inches<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☐<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | A | 10YR 3/1 | --- | --- | Saturated silt clay |
| 3-12 | B | 7.5Y 6/1 | 10YR 6/6 | 5%, small, diffuse | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation

Stream name (if known):

S1520

Approximate distance to stream:

1000 ft

What watershed is the delineated wetland within?

SVC73

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: None, Isolated

**Rationale/Remarks:**

**Small low value PEM wetland, with little vegetative diversity, located in small depressional area. Inflow and outflow not observed. Possible inflow from overland flow from adjacent up-gradient area. In close proximity to D1523, but depressional and not connected.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM with 2 trees<br>Transect ID: SVC70-W549<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FAC | 20 | | | | |
| *Juncus effusus* | H | FACW+ | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Solidago* sp. | H | ≥FAC | 10 | | | | |
| *Malus sp.* | T | FACU | 7 | | | | |
| *Crataegus sp.* | T | <=FAC | 7 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 83%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In places | Water Marks: ☐ on | Sediment Deposits: ☒ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-9 | A | 10YR 3/1 | --- | --- | Saturated silty clay |
| 9-12 | B | 2.5Y 4/2 | 10YR 5/6 | 5%, small, diffuse | Moist silty clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation (outside survey corridor)

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

300 ft

What watershed is the delineated wetland within?

SVC70

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☒ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PEM wetland with moderate vegetative diversity, abutting upland forested area. High groundwater discharge/recharge function and value. Receives inflow from southwest via overland surface flow off up-gradient hillside drain D549 and groundwater seepage. Discharge east via overland flow and direct connection to D549a. Drain flows to south then southeast which becomes a stream, an unnamed tributary to Silver Creek, outside survey corridor**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek, J. Zoladz | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC70-W550<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FAC | 15 | | | | |
| *Osmunda cinnamomea* | H | FACW | 5 | | | | |
| *Impatiens capensis* | H | FACW | 10 | | | | |
| *Carex* spp. | H | ≥FAC | 10 | | | | |
| *Scirpus cyperinus* | H | FACW+ | 20 | | | | |
| *Rosa multiflora* | S | FACU | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: --- inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 9 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Drain from west flows into southern boundary and out in southeastern corner | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-10 | A | 10YR 2/1 | --- | --- | Moist silt clay | B horizon has metallic odor; many roots and some organic material in A horizon. Thin layer of hard concretions (~1/2 inch) separating A and B layers |
| 10-13+ | B | 5Y 5/1 | 2.5Y 5/6 | 10% mottles, streaky distinct | Many large concretions, sandy clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Visual observation

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

200 meters

What watershed is the delineated wetland within?

SVC70

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:
- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small sized, moderate valued PEM wetland, with moderate vegetative diversity, located on east facing slope, abutting upland forest to south and west. Receives inflow from overland sheet flow from the west and south, drainage from drain D550 to the southwest, and groundwater seepage. Outflow via groundwater recharge and discharge, and into wetland W549 via D 550 and overland sheet flow. Possible groundwater recharge as source for groundwater discharge in W549.**

**FEATURE ID : SVC106-S543**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/7/08

State: NY

Observers: H. Childs, R. Dutton, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☐ Non-RPW ☒

Perennial ☐ Intermittent ☐
Ephemeral ☒

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☐ Manipulated ☒

Watershed: Silver Creek 106

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 1/2-3 ft

Width (ft) (bank to bank) 2-10 ft

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

vegetated bottom

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC106-S543**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☒ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: *Impatiens capensis*, *Equisetum arvense*, common roadside/field herbs |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 3-6 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 3-6 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: East | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W543 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☒ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? Little to none | | | | Comments: |
| Description of Erosion: | | | | |

Comments:

Stream S543 enters survey corridor on west side as outflow from manmade pond (pond is outside corridor). It flows north through Wetland W544, then parallel to driveway and into western segment of wetland W543. It passes under driveway through culvert into the east segment of wetland W543, and continues as a drain through that segment. Becomes stream-like again briefly out of corridor to east, then less channelized. Probably becomes more channelized further out of corridor, as it is located near a NYS DEC mapped stream.

**FEATURE ID :SVC103- S1519**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/7/08

State: NY

Observers: H. Childs, R. Dutton, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: slight meanders

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC103

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 4-6 ft

Width (ft) (bank to bank) 6-8ft

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☒ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID :SVC103- S1519**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: _East__ | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| | | | upstream | Crayfish |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: green frog, dusky salamander, two lined salamander, mayfly larvae |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? ___riffles and runs_____ | | | | If yes, list: |
| Evidence of Erosion? ___No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

Rocky stream, flows through culvert under road. Banks have all upland vegetation. Stream is south of about 15 honey bee boxes. Vegetation is burdock, Rubus species, honeysuckle, and sugar maple. More bee boxes are on the south side of the stream, approximately 30 total.

**FEATURE ID :SVC73-S1520 .**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/8/08

State: NY

Observers: H. Childs, A. Kielaszek, J. Zoladz

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC73

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 7-12 feet

Width (ft) (bank to bank) 7-12 feet

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☒ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID :SVC73-S1520 .**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: Witchhazel, multiflora rose |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 2 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 2 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: East | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? Yes | | | | Comments: |
| Description of Erosion: some undercutting of tree roots on banks | | | | |

Comments:

Stream S1520 is a perennial stream with, high wildlife value, many tracks in riparian zone. Some large rocks in gravel (> 6” diameter). Many areas with runs and riffles. Collects runoff from the south via drain D1520.

Sector E

Collection Line

Wetland Datasheets

UD567, W555, W558, W559, W560, W561, W563, W564, W567, W569, W570 & W570A, Wt71, W572

Stream Datasheets
S561, S564

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park | Date: 05/1308 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): J. Zoladz, R. Dutton | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: Upland |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC103-UD567 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: N/A |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Carex species* | H | ≥ FAC | 15 | | | | |
| *Ranunculus acris* | H | FAC+ | 5 | | | | |
| *Taraxacum officinale* | H | FACU- | 2 | | | | |
| *Solidago graminifolia* | H | FAC | 5 | | | | |
| *Rosa multiflora* | S | FACU | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 66%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| WQ if sat/inundated: ☐ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: >12 inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Depth to saturated soil: >12 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☐ **Yes** ☒ **No**

Rationale for decision/remarks: No saturated soil or water in pits, no water stained leaves.

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 2.5Y 4/2 | 7.5YR 5/6 | 3%, small, diffuse | Slightly moist loam | Mottles only >12 inches |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☐ **Yes** ☒ **No**

Rationale for decision/Remarks: Mottles very deep and weak

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☐ **Yes** ☒ **No**

Wetland hydrology present? ☐ **Yes** ☒ **No**

Is the sampling point within a wetland? ☐ **Yes** ☒ **No**

What is this based on?

_____

Stream name (if known):

_

Approximate distance to stream:

_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_____

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Slight wet pasture land with wet vegetation. Soils very weak. No hydrology – UPLAND. Up-gradient from wetland W567a.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY Sector E |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC129-W555<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 15 | | | | |
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Carex* sp. | H | ≥FAC | 15 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

Dominant grass all dead. Little vegetation. Mostly shallow, mud/standing water.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-5 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: no free water due to high clay content inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☐ Yes ☒ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-9 | A | 10YR 2/1 | --- | --- | Saturated silty clay |
| 9-14 | B | 2.5Y 2.5/1 | --- | --- | Moist silty clay with concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation

Stream name (if known):

S551 Unnamed tributary to Silver Creek

Approximate distance to stream:

approximately 500 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC129

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PEM wetland with very low vegetative diversity. Moderate amphibian habitat. 1 egg mass, tadpoles observed. Receives inflow from surface water runoff from up-gradient. Active agricultural field to east. Outflow through drain D555 to west. D555 flows out of corridor and connects to wetland W554 via discrete flow. Ultimately reaches an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: open water PEM<br>Transect ID: SVC121-W558<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 90 | | | | |
| *Poa* sp. | H | ≥ FAC | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-12 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Open water depression | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 10YR 2/1 | 10YR 6/8 | 1%, small, distinct | Saturated silt clay |
| 6-12+ | B | 10YR 5/1 | 10YR 6/8 | 30%, large, distinct | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S561, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

400 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC121

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small to moderate size, high amphibian habitat value PEM wetland with little vegetative diversity, with mostly water, 1 foot standing water. Located within active cow pasture. Receives inflow via surface runoff from southeast. Outflow northwest via drain D558 which drains to agricultural ditch (D558a) which drains north to stream S561, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC121-W559<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 10 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 20 | | | | |
| *Trifolium* sp. | H | FACU | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:
Wet depression in cow pasture

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☒ Other: animal waste<br>☐ Oil Sheen present | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-3 inches<br>Depth to free water in pit: 2 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-7 | A | 10YR 3/1 | 10YR 5/8 | 10%, small, distinct | Saturated silty clay | |
| 7-14 | B | 7.5YR 4/1 | 5YR 5/8 | 25%, small, distinct | Moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S561, Unnamed tributary to Silver Creek

Approximate distance to stream:

300 feet

What watershed is the delineated wetland within?

SVC121

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland, with little vegetative diversity, located in wet depression in active cow pasture. Inflow from hillside runoff from southeast. Outflow to northwest via D559, to D558a to stream S561, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, J. Zoladz | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC121-W560<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 50 | | | | |
| *Carex* sp. | H | ≥ FAC | 20 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Juncus effusus* | H | FACW+ | 10 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Wet depression in cow pasture

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1-2 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 2/1 | 10YR6/8 | 2%, small, distinct | Saturated silt clay | Oxidized zones and concretions in both horizons |
| 8-15 | B | 10YR 4/1 | 10YR 6/8 | 15%, small, distinct | Moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation

Stream name (if known):

S561, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

200 feet

What watershed is the delineated wetland within?

SVC121

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☒ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland, with little vegetative diversity, located within a cow pasture. Receives inflow via surface runoff from southeast. Outflow via drain D560, which is a 5 foot wide agricultural swale. Drain D560 drains northwest to drain D558a, which drains north to stream S561, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park | Date: 05/09/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): H. Childs, J. Zoladz | State: NY Sector E |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: SVC126-W561 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 30 | *Mentha aquatica* | H | OBL | 10 |
| *Salix species* | H | ≥ FAC | 2 | | | | |
| *Equisetum hyemale* | H | FACW | 30 | | | | |
| *Solidago* sp | H | ≥ FAC | 10 | | | | |
| *Ulmus americana* | T | FACW- | 1 | | | | |
| *Typha latifolia* | H | OBL | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
1 elm tree, still PEM

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-4 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-7 | A | 10YR 2/1 | --- | --- | Saturated silt loam |
| 7-12+ | B | 10YR 3/1 | 10YR 4/6 | 10%, small, distinct | Saturated silt loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observation

Stream name (if known):

S561 Unnamed tributary to Silver Creek

Approximate distance to stream:

Riparian (0 feet)

What watershed is the delineated wetland within?

SVC126 and SVC 121

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate value PEM wetland, with moderate vegetative diversity, many fish and amphibians observed. High filtration value. Stream S561 receives in nutrient load from cow wastes. Wetland helps filter these loads from west via S561. Also hillside groundwater seepage on wetland. Outflow direct connection to S561, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC122-W563<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW+ | 40 | | | | |
| *Juncus effusus* | H | FACW+ | 15 | | | | |
| *Mentha aquatica* | H | OBL | 5 | | | | |
| *Trifolium repens* | H | FACU- | 15 | | | | |
| *Taraxacum officinale* | H | FACU- | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 60%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 10 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Drainage to S564 via D563 | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10YR 3/1 | --- | --- | Saturated silt loam, some oxidized root channels | A horizon has many fine roots and root channels; very compacted soils |
| 6-14+ | B | 2.5Y 5/1 | 7.5YR 5/8 | 20%, small, distinct | Silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

S564, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

10 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC122 and SVC 126

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW** ☐ **P-RPW**
- ☐ **S-RPW** ☒ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland, with little vegetative diversity, located in northeast corner of active pasture. Field is next to stream S564; wetland drains into streamS564 via drain D563 and overland flow to the north. Wetland receives recharge via overland flow from southwest and D563 to the south. Some function of groundwater discharge and recharge as well as wildlife (bird) habitat. Stream S564 flows east and merges with stream S561 outside of survey corridor, ultimately to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, A. Kielaszek | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM (Riparian)<br>Transect ID: SVC122-W564<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex* sp. | H | ≥ FAC | 30 | | | | |
| *Phalaris arundinacea* | H | FACW+ | 30 | | | | |
| *Juncus effusus* | H | FACW+ | 40 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☒ Other: settled nutrient pollution from cattle<br>☐ Oil Sheen present | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-4 inches<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): Riparian to stream | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-9 | A | 10YR 2/1 | 10YR 6/8 | 2%, small, distinct | Saturated silt clay with concretions and oxidized root channels |
| 9+ | B | 10YR 4/1 | 10YR 6/8 | 20%, large, distinct | Saturated silt clay with concretions |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

S564, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

Riparian

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC122 and SVC117

Wetland is

☒ **Abutting**

☐ **Adjacent with surface connection**

☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☒ **Non-RPW**

Flow is:

☐ **discrete** ☐ **discrete and confined**

☒ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Large, low value PEM riparian wetland, with little vegetative diversity, located in ephemeral stream and agricultural swale channel. Receives inflow from northwest and west from agricultural swale channels. Outflow east via stream S564, which channelizes at east edge of wetland W564 and flows east to stream S561, an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz, R. Dutton | Date: 05/13/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC103-W567<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 20 | *Viburnum recognitum* | S | FACW- | 1 |
| *Carex species* | H | ≥ FAC | 25 | | | | |
| *Solidago graminifolia* | H | FAC | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Soildago* sp. | H | ≥ FAC | 15 | | | | |
| *Rosa multiflora* | S | FACU | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 86%

Remarks:
Active pasture land. Carex and grass grazed too low to identify.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: Not super strong, but present. Pit only 8 inches deep. Too rocky.

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10YR 4/1 | 10YR 5/8 | 10%, small, distinct | Very moist silty loam | |
| 4-8 | B | 10YR 3/1 | 10YR 5/6 | 25%, large, distinct | Silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Iron concretions

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Observations

Stream name (if known):

S1519, (Unnamed tributary to Silver Creek)

Approximate distance to stream:

550 feet

What watershed is the delineated wetland within?

Silver Creek 103

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low function and value, PEM with moderate vegetative diversity, located on a wet southeast sloping hillside on active pasture land. Receives inflow from surface water runoff from northeast up-gradient hillside, and possible groundwater upwelling. Outflow to southeast to wetland W542 via overland flow to ditch, to unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz, R. Dutton | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PFO 1/4<br>Transect ID: SVC109-W569<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 9 | *Veratrum viride* | H | FACW+ | 3 |
| *Impatiens capensis* | H | FACW | 12 | *Lindera benzoin* | S | FACW- | 9 |
| *Lysimachia nummularia* | H | OBL | 12 | *Solidago* sp. | H | ≥FAC | 3 |
| *Matteuccia struthiopteris* | H | FACW | 9 | *Ulmus americana* | T | FACW- | 18 |
| *Carex crinita* | H | OBL | 3 | *Acer saccharum* | T | FACU- | 6 |
| *Betula alleghaniensis* | T | FAC | 6 | *Tsuga canadensis* | T | FACU | 3 |
| | | | | *Fraxinus pennsylvanica* | T | FACW | 6 |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 85%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In some areas | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: <1 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 10 inches<br>Depth to saturated soil: 7 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9 | A | 10YR 3/1 | --- | --- | Silty clay loam | Lots of roots in A layer |
| 9-14+ | B | 2.5Y 2.5/1 | 2.5YR 3/6 | Small, distinct, 15% | Clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation

Stream name (if known):

S1519 Unnamed tributary of Silver Creek

Approximate distance to stream:

100 feet

What watershed is the delineated wetland within?

Silver Creek 109

Comments:

D569 turns into stream S1519 outside of corridor

Flow relationship to associated stream:

- ☒ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Very large, high value PEM/PFO wetland, with high vegetative diversity, that extends out of the corridor to the east and west. Many open areas throughout the wetland. Many upland hummocks interspersed, many with hemlock. Inflow mostly from south via overland flow, groundwater seepage, and historic logging road ruts acting as drains. Outflow to the northeast via drain D569 which channelizes into a stream outside the corridor.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz, R. Dutton | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC113-W570&W570A<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 25 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Equisetum arvense* | H | FAC | 5 | | | | |
| *Rubus hispidus* | H | FACW | 20 | | | | |
| *Carex* sp. | H | ≥FAC | 10 | | | | |
| *Lysimachia nummularia* | H | OBL | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>(Due to poor permeability)<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 10YR 3/1 | --- | --- | Silt loam |
| 5-12+ | B | 2.5Y 2.5/2 | 10YR 4/6 | | Sandy loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation, eventually flows to S1520

Stream name (if known):

S1520, Unnamed tributary to Silver Creek

Approximate distance to stream:

300 feet

What watershed is the delineated wetland within?

SVC113 and SVC110

Comments:

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM, with moderate vegetative diversity, associated with historical logging ruts. Inflow from surface water runoff from up-gradient hillside to southwest. Outflow to northeast via historical logging road ruts during rain events. Ruts lead to wetland W569 outside corridor. Ultimately to unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): J. Zoladz, R. Dutton | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC112-W571<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Impatiens capensis* | H | FACW | 10 | *Ulmus americana* | T | FACW- | 20 |
| *Fagus grandifolia* | T/S | FACU | 10 | *Fraxinus pennsylvanica* | T | FACW | 5 |
| *Equisetum arvense* | H | FAC | 5 | *Acer rubrum* | T | FAC | 5 |
| *Carex species* | H | ≥ FAC | 10 | | | | |
| *Onoclea sensibilis* | H | FACW | 5 | | | | |
| *Veratrum viride* | H | FACW+ | 2 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 89%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In small areas | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: <2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10YR 3/1 | 2.5YR 3/6 | Medium, few, distinct, 10% | Silt loam | Some roots in A layer |
| 6-12+ | B | Gley1 6/10Y | 5YR 3/4 | Few, large, prominent, 5% | Sandy clay loam | B Layer has lots of gravel |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: Magnesium concretions

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Stream delineated as S128, outside of the survey corridor.

Stream name (if known):

S128, Unnamed tributary to Silver Creek

Approximate distance to stream:

300 feet

What watershed is the delineated wetland within?

Silver Creek 112

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value, PFO wetland with moderate vegetative diversity, located in a forest, with pit and hummock topography. Inflow is from up-gradient surrounding area. Outflow is to southeast via drain D571 down an historic logging road, which currently has no flow. Water flow will occur during moderate to heavy rain events. Drain D571 continues outside the corridor to an unnamed tributary to Silver Creek. Red spotted newt and pickerel frog found.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): H. Childs, R. Dutton | Date: 05/15/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: SVC112-W572<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Equisetum arvense* | H | FAC | 10 | | | | |
| *Dryopteris spinulosa* | H | FAC+ | 5 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 25 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:
Some lone spots, green ash very small – less than 6 inches

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ In places | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☐ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Valois gravelly silt loam**

Drainage Class **Well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 2.5Y 3/2 | 2.5Y 6/4 | 3%, small, diffuse | Moist loam |
| 6-12 | B | 2.5Y 6/2 | 7.5YR 5/8 | 25%, medium, prominent | Clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Associated stream, S128, delineated but outside of the survey corridor.

Stream name (if known):

S128, Unnamed tributary to Silver Creek

Approximate distance to stream:

200 feet

What watershed is the delineated wetland within?

Silver Creek 112

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size, linear low value and diversity PEM wetland located in wooded area. Occurs within an old logging road. Receives inflow via runoff from gently northeast sloping topography and via very minor drain D571 from W571 to north. Outflow east via drains D572 and D571 to an unnamed tributary to Silver Creek, outside of survey corridor, approximately 200 feet away.**

**FEATURE ID : SVC126-S561**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 5/10/08

State: NY

Observers: H. Childs, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: flows through gently sloping pasture land, following mild topography

Tributary is: Natural ☒ Manipulated ☐

Watershed: SVC126 and SVC 121

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 1 to 3 feet

Width (ft) (bank to bank) 6 to 9 feet

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

muddy bottom

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC126-S561**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: Mint, goldenrods, horsetails, cattails |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 25 ft left bank<br>25 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: North | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W561 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| | | | | Fish – minnow species |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? No | | | | Comments: |
| Description of Erosion: | | | | |

Comments:

Stream S561 is a Minor stream flowing north out of a compacted, muddy cow pasture, through wetland W561 (vegetated pasture). Stream meanders through gently sloping terrain with a large riparian zone on both banks.

**FEATURE ID : SVC122-S564**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: S564 (Unnamed tributary to Silver Creek)

Date: 5/10/08

State: NY

Observers: H. Childs, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☐ Non-RPW ☒

Perennial ☐ Intermittent ☐
Ephemeral ☒

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☐ Manipulated ☒

Watershed: SVC122

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 1 to 3 feet

Width (ft) (bank to bank) 4 to 6 feet

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☒ Other

few rounded rocks

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☒ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : SVC122-S564**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: Upland field/meadow herbaceous cover |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 0-2 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 0-2 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: East | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W564 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Cattle |
| Evidence of Pollution? Yes: active cow pasture with nutrients | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? No | | | | Comments: |
| Description of Erosion: | | | | |

Comments:

Stream S564 is a NYSDEC mapped stream whose channel may have been manipulated into agricultural drainage. Channel is wide and vegetated in west portion of corridor and without flow. It is mapped as wetland in that area. Flow becomes evident at eastern edge of wetland W564, and continues east to stream S561 out of corridor.

# Sector E

## Cluster 24

### Wetland Photos

W551, W552, W553, W554, W556 and W557

### Drain Photos

D551

### Stream Photos

S551

### Pond Photos

PO553

### Turbine Location Photos

T56




Date: May 8, 2008
Location P763: Groundwater seep into Wetland W551 from Drain D551-2
Direction of View: West




Date: May 8, 2008
Location P764: Wetland W551 from Drain D551-2
Direction of View: South




Date: May 8, 2008
Location P765: Japanese Knotweed to east of Stream S551 from Drain D551-2
Direction of View: East




Date: May 8, 2008
Location P766: Stream S551 from S551-3
Direction of View: North




Date: May 8, 2008
Location P767: Stream S551 from S551-3
Direction of View: South




Date: May 8, 2008
Location P768: Wetland W552 from 10 feet west of W552-4
Direction of View: Northeast




Date: May 9, 2008
Location P769: Pond PO553 from 30 feet south of pond behind Wetland W553-3
Direction of View: North




Date: May 9, 2008
Location P770: Wetland W553 from W553-1
Direction of View: East




Date: May 9, 2008
Location P771: Slope runoff inflow to Pond PO553 and Wetland W553
Direction of View: Southwest




Date: May 9, 2008
Location P772: Wetland W554 from 10 feet west of W554-13
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 9, 2008
Location P773: Wetland W554 from 10 feet west of W554-13
Direction of View: Northeast




Date: May 9, 2008
Location P774: Wetland W554 showing cuts from road at southeast outflow, W554-6
Direction of View: Southeast




Date: May 9, 2008
Location P775: Wetland W555 from W555-1
Direction of View: East




Date: May 9, 2008
Location P776: Drain D555 from start, where it connects to Wetland W554
Direction of View: Southwest




Date: May 9, 2008
Location P781: Wetland W556 at 15 feet south of W556-3
Direction of View: North




Date: May 9, 2008
Location P782: Unmapped portion of Wetland W556 from 15 feet south of W556-3
Direction of View: West

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Spring 6608




Date: May 9, 2008
Location P783: Wetland W557 from W557-9
Direction of View: Southwest




Date: May 9, 2008
Location P777: T56
Direction of View: North




Date: May 9, 2008
Location P778: T56
Direction of View: West




Date: May 9, 2008
Location P779: T56
Direction of View: South

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Spring 6608




Date: May 9, 2008
Location P780: T56
Direction of View: East

# Sector E

## Cluster 25

### Wetland Photos

W129, W130, W131, W132, W133, W134, W565, W566, W573, W574, W575, W576, W577, W578, W579, W580, W581, W582, W583, W584, W585, W586, W587, W588, W589, W590, W591, W592, W593, W594 and W605

### Drain Photos

D565, D579, D582, D1529

### Stream Photos

S577, S583, S591, S592, S594

### Pond Photos

PO565, PO5501

### Turbine Location Photos

T57, T58, T59, T60 and T67




Date: May 19, 2008
Location P924: Wetland W594 from WD594
Direction of View: East




Date: May 19, 2008
Location P925: Surface runoff outflow from W594 from WD594
Direction of View: Northeast



Date: May 19, 2008
Location P926: Culvert inflow to Stream S594
Direction of View: South



Date: May 19, 2008
Location P927:  Stream S594
Direction of View: East




Date: May 19, 2008
Location P923: Wetland W593 and culvert to W592
Direction of View: Southwest




Date: May 19, 2008
Location P922: Wetland W593 and inflow from S592 from W593-10
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: May 19, 2008
Location P920: Wetland W592 from W592-10
Direction of View: East




Date: May 19, 2008
Location P921: Wetland W592 at W592-10
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: May 17, 2008
Location P905: Southern portion of Wetland W588 from Drain D588-2
Direction of View: South



Date: May 17, 2008
Location P906: Northern portion of Wetland W588 from Drain D588-2
Direction of View: North




Date: May 16, 2008
Location P876: Wetland W579 from WD579
Direction of View: North




Date: May 16, 2008
Location P877: Wetland W579 from WD579
Direction of View: East




Date: May 16, 2008
Location P878: Drain D579 from D579-2
Direction of View: Southeast




Date: May 16, 2008
Location P879: Drain D579 from D579-2
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 16, 2008
Location P880: Wetland W580 from W580-7
Direction of View: South



Date: May 16, 2008
Location P881: Wetland W580 outflow from Drain D580 from D580-4
Direction of View: North



Date: May 16, 2008
Location P882: Wetland W581 from east of W581-5
Direction of View: South




Date: May 16, 2008
Location P872: T58
Direction of View: North




Date: May 16, 2008
Location P873: T58
Direction of View: West




Date: May 16, 2008
Location P874: T58
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 16, 2008
Location P875: T58
Direction of View: East



Date: May 16, 2008
Location P870: Wetland W578 from between W578-9 and -1
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: May 16, 2008
Location P871: Wetland W578 from between W578-9 and -1
Direction of View: North



Date: June 13, 2008
Location P1717: Wetland W577 from culvert crossing between W134 and W577
Direction of View: East



Date: June 13, 2008
Location P1718: Stream S577 and culvert crossing
Direction of View: Southwest



Date: June 13, 2008
Location P1719: Stream S577, from culvert crossing
Direction of View: Northeast




Date: May 15, 2008
Location P864: Stream S577 from SD577
Direction of View: East




Date: May 15, 2008
Location P865: Stream S577 from SD577
Direction of View: West




Date: May 16, 2008
Location P867: Wetland W577 from WD577
Direction of View: East




Date: May 16, 2008
Location P868: Wetland W577 from WD577
Direction of View: South



Date: June 13, 2008
Location P1712: Wetland W134 from southeast of W134-7
Direction of View: Northeast



Date: June 13, 2008
Location P1713: Wetland W134 from southeast of W134-7
Direction of View: Southwest



Date: June 13, 2008
Location P1714: Culvert crossing between Wetland W134 and W577
Direction of View: North



Date: June 13, 2008
Location P1715: Wetland W134, from culvert crossing between W134 and W577
Direction of View: North

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Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1716: Wetland W134 and W577, from culvert crossing between
Direction of View: South



Date: June 13, 2008
Location P1708: Wetland W133-5 and -6; existing road in background
Direction of View: East

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Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1709: Wetland W133 draining north to Stream S576 from W133-8
Direction of View: North



Date: June 13, 2008
Location P1710: Wetland W133 meeting Stream S576
Direction of View: North

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Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1711: Wetland W133 draining north into Stream S576, from southeast of W133-19
Direction of View: South



Date: June 13, 2008
Location P1701: Stream S132 (upstream) and northwest end of Wetland W132
Direction of View: Northwest

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Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1695: Stream S132 inflow from Wetland W576
Direction of View: North



Date: June 13, 2008
Location P1702: Stream S132 and Wetland W132 from northeast of W132-2
Direction of View: Southeast



Date: June 13, 2008
Location P1703: Stream S132 from road crossing
Direction of View: North



Date: June 13, 2008
Location P1704: Stream S132 from road crossing
Direction of View: South




Date: May 15, 2008
Location P857: Stream S576 from SD576
Direction of View: West




Date: May 15, 2008
Location P858: Stream S576 from SD576
Direction of View: East



Date: May 15, 2008
Location P859: Wetland W576c from W576c-5
Direction of View: West




Date: May 15, 2008
Location P860: Wetland W576c from W576c-5
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 15, 2008
Location P861: Wetland W576b from W576d-3
Direction of View: South




Date: May 15, 2008
Location P862: Wetland W576d from W576d-3
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 15, 2008
Location P863: Wetland W576a from W576a-3
Direction of View: South



Date: June 13, 2008
Location P1694: Stream S576 (upstream) and Wetland W576E-9
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1696: Stream S576 (downstream) and riparian Wetland W576E
Direction of View: East



Date: June 13, 2008
Location P1705: Stream S576 breaches road and drains northeast
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1706: Stream S576 enters at W576-4
Direction of View: East



Date: June 13, 2008
Location P1707: Where existing road runs adjacent to Wetland W576F
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1700: Wetland W131 from WD131
Direction of View: Southeast



Date: June 13, 2008
Location P1697: Wetland W130 (cattails) drain southwest along edge of woods
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1698: Drain D130 going southwest into Stream S132, from east of D130-2
Direction of View: Southwest



Date: June 13, 2008
Location P1699: Wetland W130, well and phragmites from W130-2a
Direction of View: Northeast




Date: May 15, 2008
Location P855: Wetland W575 from W575-1
Direction of View: Southeast




Date: May 15, 2008
Location P856: Wetland W575 from W575-1
Direction of View: Northwest




Date: May 15, 2008
Location P853: Wetland W574 from W574-1
Direction of View: Northwest




Date: May 15, 2008
Location P854: Wetland W574a from W574a-3
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 15, 2008
Location P852: Wetland W573 from southeast of W573-2
Direction of View: Northwest



Date: June 13, 2008
Location P1687: Wetland W129, wet logging road portion, from north of W129-23
Direction of View: South



Date: June 13, 2008
Location P1688: East edge of Wetland W129 from south of W129-1
Direction of View: North



Date: June 13, 2008
Location P1689: Wet logging road going south to Drain D129, from south of W129-1
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1690: South edge of wetland W129 and start of Drain D129
Direction of View: North



Date: June 13, 2008
Location P1691: Wetland W129, gas well opening and phragmites along north boarder
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 13, 2008
Location P1692: Drain D129 effluent (dry)
Direction of View: South




Date: May 15, 2008
Location P848: T67
Direction of View: North




Date: May 15, 2008
Location P849: T67
Direction of View: West




Date: May 15, 2008
Location P850: T67
Direction of View: South




Date: May 15, 2008
Location P851: T67
Direction of View: East




Date: May 19, 2008
Location P919: Drain D1529 at shovel
Direction of View: Northeast




Date: May 16, 2008
Location P885: Drain D582 from WD582
Direction of View: Northwest




Date: May 16, 2008
Location P886: Wetland W582 from WD582
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 16, 2008
Location P883: Stream S591 where Access Road 24 crosses
Direction of View: Northeast




Date: May 16, 2008
Location P884: Stream S591 where Access Road 24 crosses
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: May 19, 2008
Location P915: Wetland W591 from WD591
Direction of View:  Southwest



Date: May 19, 2008
Location P916: Wetland W591 from WD591
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: May 19, 2008
Location P917: Wetland W591 from W591-17
Direction of View: Northeast



Date: May 19, 2008
Location P918: Wetland W591 from W591-17
Direction of View: East




Date: May 19, 2008
Location P913: Wetland W590 from W590-1 and -5
Direction of View: West




Date: May 19, 2008
Location P914: Wetland W590 from W590-1 and -5
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 19, 2008
Location P907: Wetland W589 from W589-1
Direction of View: North




Date: May 19, 2008
Location P908: Wetland W589 from W589-1
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 21, 2008
Location P1000: Wetland W605 at W605-4
Direction of View: North




Date: May 21, 2008
Location P1001: Wetland W605 at W605-4
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 19, 2008
Location P909: T59
Direction of View: North




Date: May 19, 2008
Location P910: T59
Direction of View: West




Date: May 19, 2008
Location P911: T59
Direction of View: South




Date: May 19, 2008
Location P912: T59
Direction of View: East




Date: May 10, 2008
Location P806: Wetland W565 facing Drain D565 and Pond PO565
Direction of View: West




Date: May 10, 2008
Location P807: Wetland W565 from W565-4
Direction of View: East




Date: May 10, 2008
Location P808: Wetland W566 from W566-2
Direction of View: Northeast




Date: May 10, 2008
Location P809: Pond PO5501 from PO5501-2
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 10, 2008
Location P802: T57
Direction of View: North




Date: May 10, 2008
Location P803: T57
Direction of View: West




Date: May 10, 2008
Location P804: T57
Direction of View: South




Date: May 10, 2008
Location P805: T57
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 17, 2008
Location P900: Wetland W587 from WD587
Direction of View: North




Date: May 17, 2008
Location P901: Wetland W587 from WD587
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 17, 2008
Location P899: PEM portion of W586 from WD586
Direction of View: Northeast




Date: May 17, 2008
Location P898: PFO portion of Wetland W586 from WD586
Direction of View: Southwest




Date: May 17, 2008
Location P897: Wetland W585 from W585-2
Direction of View: Northeast




Date: May 17, 2008
Location P896: Wetland W585 from W585-2
Direction of View: Northwest



Date: May 17, 2008
Location P895: Wetland W584 from between W584-1 and -13
Direction of View: Southeast



Date: May 16, 2008
Location P891: Wetland W583 from between W583-1 and -2
Direction of View: Southeast



Date: May 16, 2008
Location P892: Wetland W583 from between W583-1 and -2
Direction of View: South




Date: May 16, 2008
Location P893: Stream S583 from SD583
Direction of View: Northwest




Date: May 16, 2008
Location P894: Stream S583 from SD583
Direction of View: North




Date: May 16, 2008
Location P887: T60
Direction of View: North




Date: May 16, 2008
Location P888: T60
Direction of View: West




Date: May 16, 2008
Location P889: T60
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 16, 2008
Location P890: T60
Direction of View: East

# Sector E

## Cluster 27

### Wetland Photos

W541, W542, W543, W544, W545, W546, W547, W548, W549 and W550

### Drain Photos

D541, D541a, D548 and D550

### Stream Photos

S1501, S1520, S543 and S545

### Pond Photos

PO544

### Turbine Location Photos

T61 and T62

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 7, 2008
Location P716: Wetland W541 from between W541-3 and -4
Direction of View: East



Date: May 7, 2008
Location P718: Drain D541 inflow to Wetland W541 from between W541-3 and -4
Direction of View: West



Date: May 7, 2008
Location P719: Drain D541a, roadside ditch that veers away from road at culvert
Direction of View: West



Date: May 7, 2008
Location P720: Drain D541a, roadside ditch
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 7, 2008
Location P721: Wetland W542
Direction of View: West



Date: May 7, 2008
Location P722: Wetland W542 at culvert outflow
Direction of View: Northeast




Date: May 7, 2008
Location P723:  Stream S1501 to culvert
Direction of View: East




Date: May 7, 2008
Location P724: Stream S1501
Direction of View: West




Date: May 7, 2008
Location P725: Stream S1501 to culvert
Direction of View: West




Date: May 7, 2008
Location P726: Stream S1501
Direction of View: East



Date: May 7, 2008
Location P727: East segment of Wetland W543 from W543-4
Direction of View: East



Date: May 7, 2008
Location P728: West segment of Wetland W543 from W543-4
Direction of View: Southwest



Date: May 7, 2008
Location P729:  Stream S543 from W543-18
Direction of View: North




Date: May 7, 2008
Location P730: Driveway dividing Wetland W543 in to two polygons, from W543-11 and -4
Direction of View: South




Date: May 7, 2008
Location P731: Culvert at Wetland W544 from W544-4
Direction of View: South




Date: May 7, 2008
Location P732: Wetland W544
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: June 9, 2008
Location P1664: Pond PO544 from PO54405
Direction of View: South



Date: June 9, 2008
Location P1665: Wetland W544 below pond bank from PO544-5
Direction of View: Northeast




Date: May 7, 2008
Location P744: Wetland W546 from W546-14
Direction of View: North




Date: May 7, 2008
Location P733: Wetland W545 at W545-4
Direction of View: West




Date: May 7, 2008
Location P734: Wetland W545 and Stream S545 from W545-4
Direction of View: West




Date:May 7, 2008
Location P736: T62
Direction of View: North




Date: May 7, 2008
Location P742: T62
Direction of View: West




Date: May 7, 2008
Location P740: T62
Direction of View: South




Date: May 7, 2008
Location P738: T62
Direction of View: East




Date: May 7, 2008
Location P745: Wetland W547 from W547-7
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 7, 2008
Location P746: Wetland W547 from W547-7
Direction of View: Southeast




Date: May 8, 2008
Location P747: Stream S1520 from SD1520 at Access Road 25 crossing
Direction of View: East




Date: May 8, 2008
Location P748: Stream S1520 from SD1520 at Access Road 25 crossing
Direction of View: West




Date: May 8, 2008
Location P549: Wetland W548 from W548-3
Direction of View: West




Date: May 8, 2008
Location P750: Wetland W548 from W548-3
Direction of View: South




Date: May 8, 2008
Location P751: Wetland W549 from WD549
Direction of View: Southwest




Date: May 8, 2008
Location P752: Wetland W549 from WD549
Direction of View: East




Date: May 8, 2008
Location P753: Wetland W549 and Drain D549 from 20 feet east of W549-22
Direction of View: West




Date: May 8, 2008
Location P754: Drain D549 inflow from W549-5
Direction of View: South




Date: May 8, 2008
Location P755: Wetland W550 from W550-5
Direction of View: Southwest




Date: May 8, 2008
Location P756: Wetland W550 from W550-5
Direction of View: Northwest




Date: May 8, 2008
Location P757: Wetland W550 at centerline of Access Road 25 from W550-22
Direction of View: Southeast




Date: May 8, 2008
Location P758: Drain D1521 from D1521-2
Direction of View: Southeast




Date: May 8, 2008
Location P759: T61
Direction of View: North




Date: May 8, 2008
Location P760: T61
Direction of View: West




Date: May 8, 2008
Location P761: T61
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 8, 2008
Location P762: T61
Direction of View: East

# Sector E

**Cluster 26**

**Wetland Photos**

W568

**Drain Photos**

NA

**Stream Photos**

S1526, S568

**Turbine Location Photos**
T64, T65 and T66




Date: May 13, 2008
Location P815: Stream S1526 (upstream)
Direction of View: Northeast




Date: May 13, 2008
Location P816: Stream S1526 (downstream)
Direction of View: Southwest




Date: May 13, 2008
Location P817: T66
Direction of View: North




Date: May 13, 2008
Location P818: T66
Direction of View: West




Date: May 13, 2008
Location P819: T66
Direction of View: South




Date: May 13, 2008
Location P820: T66
Direction of View: East




Date: May 13, 2008
Location P821: T66 sloping to Stream S1526
Direction of View: Southeast




Date: May 13, 2008
Location P822: T66 sloping to Stream S1526
Direction of View: Northeast




Date: May 13, 2008
Location P823: T65
Direction of View: North




Date: May 13, 2008
Location P824: T65
Direction of View: West




Date: May 13, 2008
Location P825: T65
Direction of View: South




Date: May 13, 2008
Location P826: T65
Direction of View: East




Date: May 13, 2008
Location P828: Wetland W568 at Access Road 26 centerline
Direction of View: West




Date: May 13, 2008
Location P829: Wetland W568 and Stream S568 Access Road 26 centerline
Direction of View: East




Date: May 13, 2008
Location P830: T64
Direction of View: North




Date: May 13, 2008
Location P831: T64
Direction of View: West




Date: May 13, 2008
Location P832: T64
Direction of View: South




Date: May 13, 2008
Location P833: T64
Direction of View: East

# Sector E

## Collection Line

### Wetland Photos

W555, W558, W559, W560, W561, W563, W564, W567, W569, W570, W571 and W572

(See Cluster 27 for W542)

### Drain Photos

D1528, D1528a, D555, D558a, D559, D560, D569, D569a, D569b, D570 and D571

### Stream Photos

S561 and S564
(See Cluster 25 for S577)

### Pond Photos

PO1001, PO1528

### Turbine Location Photos

NA




Date: May 9, 2008
Location P784: Wetland W558 and Drain D558 from between W558-1 and -2
Direction of View: Northwest




Date: May 9, 2008
Location P785: Wetland W559 from W559-5
Direction of View: Northwest




Date: May 9, 2008
Location P786: Junction of Drains D558 and D559. Shovel at centerline of collection line
Direction of View: North




Date: May 9, 2008
Location P787: Wetland W560 and WD560 (at shovel) from W560-5
Direction of View: Northwest




Date: May 9, 2008
Location P789: Drain D560, 6 foot agricultural swale from W560-5
Direction of View: Southeast




Date: May 10, 2008
Location P793: Stream S561 inflow (out of corridor) from SD561
Direction of View: Southwest




Date: May 10, 2008
Location P794: Stream S561 and Wetland W561 at collection line crossing from SD561
Direction of View: South




Date: May 10, 2008
Location P795: Stream S561 and Wetland W561 at collection crossing
Direction of View: Northeast




Date: May 10, 2008
Location P796: Stream S561 and Wetland W561 from S561-7
Direction of View: North




Date: May 10, 2008
Location P797: Wetland W563 and Drain D563 from WD563
Direction of View: North




Date: May 10, 2008
Location P798: Wetland W563 from WD563
Direction of View: East




Date: May 10, 2008
Location P799: Wetland W564 within mapped Stream S564 from collection line crossing
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608



Date: May 10, 2008
Location P800: Wetland W564 at agricultural swale portion from collection line crossing
Direction of View: Northwest



Date: May 10, 2008
Location P801: Stream S564 from collection line crossing
Direction of View: East




Date: May 17, 2008
Location P904: Second crossing of S577 at collection crossing
Direction of View: North




Date: May 13, 2008
Location P812: Wetland W567 from WD567
Direction of View: North




Date: May 13, 2008
Location P813: Wetland W567 from WD567
Direction of View: South




Date: May 17, 2008
Location P902: Pond PO1528 from PO1528-2
Direction of View: North



Date: June 13, 2008
Location P1721: Drain D1528a edging to Pond PO1528
Direction of View: South



Date: June 13, 2008
Location P1722: Drain D1528a going north to groundwater
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 17, 2008
Location P903: Drain D1528 at collection crossing
Direction of View: North



Date: June 13, 2008
Location P1720: Pond PO1001
Direction of View: Northwest




Date: May 14, 2008
Location P834: Wetland W569 from WD569
Direction of View: West




Date: May 14, 2008
Location P835: Wetland W569 from WD569
Direction of View: South




Date: May 14, 2008
Location P836: Wetland W569 from WD569
Direction of View: East




Date: May 14, 2008
Location P837: Wetland W569 from WD569
Direction of View: North




Date: May 14, 2008
Location P828: Drain D569a flowing southeast from Wetland W569-32
Direction of View: Northeast




Date: May 14, 2008
Location P839: Drain D569b comes off Drain D569a from Wetland W569-32
Direction of View: North




Date: May 14, 2008
Location P840: Wetland W570a from W570a-2
Direction of View: East




Date: May 14, 2008
Location P841: Wetland W570 from W570a-2
Direction of View: West




Date: May 14, 2008
Location P843: Wetland W571 and W571-23
Direction of View: Northwest




Date: May 14, 2008
Location P844: Wetland W571 at W571-23
Direction of View: Southeast




Date: May 15, 2008
Location P845: Wetland W572 from WD572
Direction of View: South




Date: May 15, 2008
Location P846: Wetland W572 from WD572
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 15, 2008
Location P847: Drain D572 from W572-7
Direction of View: East




Date: May 9, 2008
Location P775: Wetland W555 from W555-1
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 6608




Date: May 9, 2008
Location P776: Drain D555 from start, where it connects to Wetland W554
Direction of View: Southwest

# F

# Sector F

# Sector F

## Transmission Line

### Wetland Photos

UD54, W50, W51, W52, W53, W54, W56, W57, W58, W59, W60, W61, W62, W63, W64, W65, W66, W67, W68, W69, W70, W71, W72, W73, W103, W104, W105, W106, W107,W108, W109, W110, W111, W125, W126, W127, W606 and W607

### Stream Photos

S50, S54, S54a, S56, S56a, S60, S103, S108, S607, S607a, S1014, S1014a, S2000

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: Upland<br>Transect ID: WNC103-UD54<br>Status: Non-Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | *Ulmus americana* | T | FACW- | 10 |
| *Carex sp.* | H | FACW | 15 | | | | |
| *Toxicodendron radicans* | H | FAC | 40 | | | | |
| *Salix fragilis* | T | FAC+ | 15 | | | | |
| *Malus sp.* | T | FACU | 15 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 95%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated: N/A<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches<br>Depth to saturated soil: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : Hornell silt loam

Drainage Class Somewhat poorly drained

Field observations confirm mapped type? ☐ Yes ☐ No

Taxonomy (subgroup) Aeric Haplaquepts

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14+ | A | 10YR 4/3 | --- | --- | Very moist silt loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☐ **Yes** ☒ **No**

Rationale for decision/Remarks:

**Wetland Determination**

| | | |
|---|---|---|
| Hydrophytic vegetation present? | ☒ **Yes** | ☐ **No** |
| Hydric soils present? | ☐ **Yes** | ☒ **No** |
| Wetland hydrology present? | ☒ **Yes** | ☐ **No** |
| Is the sampling point within a wetland? | ☐ **Yes** | ☒ **No** |

**Upland Relationship**

Wetland is
- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_ NA

Stream name (if known):

_NA_____

Approximate distance to stream:

_NA_____

What watershed is the delineated wetland within?

_NA_____

Comments:

**_upland datapoint_____**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Upland point taken on northwest-sloping hillside adjacent to wetland W54. Down-gradient from seeps and drain D54. Hydrophytic vegetation is present and seeps provide hydrology, however soils lack hydric indicators and suggest drainage and gradient to wetland W54**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Rupp | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WNC30-W50<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Acer rubrum* (saplings) | H | FAC | 40 | *Carex sp.* | H | ≥FAC | 12 |
| *Fraxinus pennsylvanica* | T | FACW | 4 | | | | |
| *Betula alleghaniensis* | T | FAC | 4 | | | | |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Equisetum arvense* | H | FAC | 10 | | | | |
| *Glyceria striata* | H | OBL | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 0-2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Towerville silt loam**
Taxonomy (subgroup) **Aquic Dystrochrepts**

Drainage Class Moderately well drained
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | | | | Saturated leaf litter, partly decomposed organic matter |
| 2-12+ | A | Gley 2 5/10BG | 2.5YR 3/6<br>7.5YR 5/8 | 5%, large, distinct<br>3%, large, distinct | Very moist clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation

Stream name (if known):
S50, Unnamed tributary to Walnut Creek

Approximate distance to stream:
20 - 30 feet

What watershed is the delineated wetland within?
Walnut Creek 30

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland with low vegetative diversity, located within forested area. Inflow via groundwater seep. Wetland drains south via overland flow to stream S50, an unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Rupp | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WNC30-W51<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Acer rubrum* | T | FAC | 40 | | | | |
| *Carex sp.* | H | ≥FAC | 5 | | | | |
| *Carya ovata* | T | FACU- | 40 | | | | |
| *Lindera benzoin* | S | FACW- | 15 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 95%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 1-2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0-5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Hornell silt loam**
Taxonomy (subgroup): **Aquic Dystrochrepts**

Drainage Class: Somewhat poorly drained
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 2.5Y 3/1 | 10YR 6/1 | Small, few, faint | Saturated silty loam |
| 5-12 | B | 2.5Y 6/1 | 10YR 6/8 | Many, distinct | Moist clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field Observation and desktop review_____
Stream name (if known):
__Unnamed tributary to Walnut Creek_____
Approximate distance to stream:
__800 feet_____
What watershed is the delineated wetland within?
_Walnut Creek 30_____
Comments:
_____
_____

Flow relationship to associated stream:
☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:
☐ **discrete** ☒ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, moderate value, PFO wetland typified by pit and mound topography, with moderate vegetative diversity, located on slight north-sloping hill. Receives surface water runoff and drains to the north via multiple mapped drains to unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Rupp | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WNC106-W52<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Glyceria striata* | H | OBL | 40 | | | | |
| *Toxicodendron radicans* | H | FAC | 20 | | | | |
| *Acer rubrum* | T | FAC | 5 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 40 | | | | |
| *Arisaema triphyllum* | H | FACW- | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Hornell silt loam**

Taxonomy (subgroup): **Aeric Haplaquepts**

Drainage Class: Somewhat poorly drained

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 4/1 | 7.5YR 5/8 | 10%, small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Aerial map interpretation _____

Stream name (if known):

_Unnamed tributary to Walnut Creek_____

Approximate distance to stream:

_500 feet_____

What watershed is the delineated wetland within?

_WNC106_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PFO wetland, with little vegetative diversity, associated with drain D52. Receives surface water runoff from stream S1014 from the south and drains north into wetland W53 at wetland flag W53-19. Ultimately to unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano, J. Rupp | Date: 05/08/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WNC106-W53<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Toxicodendron radicans* | H | FAC | 70 | | | | |
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 20 | | | | |
| *Ulmus americana* | T | FACW- | 15 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches<br>Depth to saturated soil: 0-5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :
**Hornell silt loam**
Taxonomy (subgroup): **Aeric Haplaquepts**

Drainage Class: Somewhat poorly drained
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 10YR 3/2 | 10YR 6/8 | 1%, small, faint | Saturated silt loam |
| 5-14 | B | 10YR 5/2 | 5YR 5/8 | 30%, large, distinct | Moist silty clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Aerial map interpretation _____
Stream name (if known):
_Unnamed tributary to Walnut Creek_____
Approximate distance to stream:
_500 feet_____
What watershed is the delineated wetland within?
_WNC106_____
Comments:
_____
_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PFO1 wetland, with little vegetative diversity, located at the base of a hill and separated from an abandoned railroad to the north by an upland berm. Inflow via drain D1014 near wetland W53-19, drain D53 near wetland W53-11. Outflow via drain D53a through a break in the berm near wetland W53-14 and then drains southwest to an unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/09/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WNC103-W54<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | *Solidago sp.* | H | ≥FAC | 5 |
| *Glyceria striata* | H | OBL | 50 | *Typha latifolia* | H | OBL | 5 |
| *Carex crinita* | H | OBL | 5 | | | | |
| *Viburnum recognitum* | S | FACW- | 5 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ at surface | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches (at surface)<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0-5 inches | Oxidized Root (live roots) Channels <12 in.: ☒<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Hornell silt loam, Barcelona silt loam, Niagara Silt loam**

Drainage Class: **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup): **Aeric Haplaquepts/ Aeric Ochraqualfs**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 10YR 3/2 | - | - | Saturated silt loam with 50% partly decomposed organic matter |
| 5-16 | B | 10YR 4/1 | 2.5YR 4/8 | 20%, large, distinct | Very moist silty clay loam |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_

Stream name (if known):

_Unnamed tributary to Walnut Creek_

Approximate distance to stream:

_Riparian_

What watershed is the delineated wetland within?

_WNC103_

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Large, high value PEM/PSS wetland (with forested components around periphery), with moderate vegetative diversity. Receives surface water runoff primarily via streams S54 and S54a as well as up-gradient runoff from northwest sloping hillside. High wildlife value (Nesting *Scolopax minor* observed), toxicant filtration, and amphibian habitat function and value. Drains northwest to an unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WNC103-W56<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 40 | | | | |
| *Solidago sp.* | H | ≥FAC | 40 | | | | |
| *Solidago rugosa* | H | FAC | 20 | | | | |
| *Salix discolor* | S | FACW | 30 | | | | |
| *Viburnum recognitum* | S | FACW- | 15 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches<br>Depth to saturated soil: 7 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : Pompton silt loam, Red Hook silt loam

Drainage Class Moderately well drained/somewhat poorly drained

Taxonomy (subgroup) Aquic Dystrochrepts , Aeric Haplaquepts

Field observations confirm mapped type? ☐ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/2 | 5YR 5/8 | 10%, small, distinct | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation_____

Stream name (if known):

_Unnamed tributary to Walnut Creek_____

Approximate distance to stream:

_Riparian_____

**Watershed Relationship**

What watershed is the delineated wetland within?

_WNC103_____

Wetland is

- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PEM/PSS wetland, with moderate vegetative diversity, associated with and extending beyond (north) the banks of stream S56. Receives surface water runoff via drains D56 and D56a and then drains to the south via discrete overland flow to stream S56 near stream point S56-10.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WNC103-W57<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex crinita* | H | OBL | 40 | | | | |
| *Glyceria striata* | H | OBL | 40 | | | | |
| *Onoclea sensibilis* | H | FACW | 15 | | | | |
| *Phalaris arundinacea* | H | FACW | 15 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : Pompton silt loam, Red Hook silt loam, Canandaigua silt loam

Drainage Class Somewhat poorly drained/very poorly drained

Field observations confirm mapped type? ☐ Yes ☐ No

Taxonomy (subgroup) Aeric Haplaquepts / Aquic Dystrochrepts / Mollic Haplaquepts

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 4/2 | 7.5YR 4/6 | 10%, small, discrete | Saturated clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field observation_____

Stream name (if known):

_Unnamed tributary to Walnut Creek_____

Approximate distance to stream:

_Riparian_____

What watershed is the delineated wetland within?

WNC103_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, moderate value PEM wetland with low vegetative diversity. Down-gradient from stream S54 culvert outflow where the stream loses its channel and drains as obvious overland flow west to stream S56 within gasline Right-of-Way. Ultimately to unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS/PFO<br>Transect ID: SVC22-W58<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | *Phalaris arundinacea* | H | FACW | 15 |
| *Juncus effusus* | H | FACW+ | 15 | *Cornus stolonifera* | S | FACW+ | 10 |
| *Solidago sp*. | H | ≥FAC | 25 | *Acer rubrum* | T | FAC | 20 |
| *Equisetum arvense* | H | FAC | 15 | | | | |
| *Salix discolor* | S | FACW | 30 | | | | |
| *Viburnum recognitum* | S | FACW- | 30 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ at surface | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0 inches (at surface)<br>Depth to free water in pit: 0 inches<br>Depth to saturated soil: 0 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase): **Canandaigua silt loam**

Drainage Class **Very poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Mollic Haplaquepts,**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-16 | A | 10YR 2/1 | 2.5YR 4/6 | 40%, small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Desktop Review

Stream name (if known):

_Unnamed tributary to Silver Creek

Approximate distance to stream:

_1000 feet

What watershed is the delineated wetland within?

_SVC22, SVC21 and WNC11

Comments:

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Large, high value PSS/PFO wetland, with high vegetative diversity, located down-gradient from pond PO58. Receives surface runoff and drainage from PO58 via drain D58 and drains D58a and D58b (all breaches in beaver dam). High groundwater recharge and discharge, and wildlife habitat function and values. Drains north via drains D58a, D58b, and D58c which presumably flow to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/10/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: SVC22-W59<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 40 | | | | |
| *Equisetum arvense* | H | FAC | 10 | | | | |
| *Solidago rugosa* | H | FAC | 15 | | | | |
| *Salix discolor* | S | FACW | 15 | | | | |
| *Apocynum sibiricum* | H | FAC | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase): **Canandaigua silt loam**

Drainage Class **Very poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Mollic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 2.5YR 3/2 | 10YR 5/8 | 5%, small, distinct | Moist sandy clay loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation_____

Stream name (if known):

_S60, Unnamed tributary to Silver Creek_____

Approximate distance to stream:

650 feet_____

What watershed is the delineated wetland within?

_SVC22_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☒ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PSS wetland, with moderate vegetative diversity, located in a natural depression. Receives surface runoff and channelized inflow via drain D58b. Drains north via drain D58b to wetland W60 and ultimately to an unnamed tributary to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, R. Dutton, J. Zoladz | Date: 05/12/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS/PFO<br>Transect ID: SVC22-W60<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 12 | *Impatiens capensis* | H | FACW | 3 |
| *Salix sp.* | S | ≥FAC | 12 | *Solidago gigantea* | H | FACW | 9 |
| *Lonicera sp.* | S | ≤FAC | 15 | *Cornus sp.* | S | ≥FAC | 12 |
| *Onoclea sensibilis* | H | FACW | 1 | *Ulmus americana* | T | FACW- | 3 |
| *Typha latifolia* | H | OBL | 3 | *Fraxinus pennsylvanica* | T | FACW | 9 |
| *Equisetum hyemale* | H | FACW | 9 | *Viburnum recognitum* | S | FACW- | 9 |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks: Large *Equisetum hyemale* population under the *Cornus* sp. shrubs. Many *Salix* sp. and *Cornus* sp. throughout wetland.

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ in places | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☒ Other: _Slight film___<br>☐ Oil Sheen present _____ | Drift Lines: ☒ | Drainage Patterns: ☒ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase): **Canandaigua silt loam**

Drainage Class **Very poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Mollic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-9 | A | 10YR 2/2 | - | - | Saturated silt loam | A lot of leaf litter and roots in the A layer, some oxidized root channels. |
| 9-14+ | B | 5Y2.5/2 | 2.5Y 5/6 | 5%, few, faint | Moist clayey silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation_

Stream name (if known):

_S60 Unnamed tributary to Silver Creek_

Approximate distance to stream:

_50 feet (drains running through wetland become stream)__

**Watershed Relationship**

What watershed is the delineated wetland within?

_SVC22_

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, high value PEM/PSS/PFO wetland, with high vegetative diversity. An NYSDEC mapped stream (S60) flows through the eastern portion of the wetland. Western and northern portions are PFO and southern portion is PSS. Receives inflow mainly from the south and from many other mapped drains throughout the wetland. Outflow is primarily to the north into stream S60, which begins in W60 as a drain.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, R. Dutton, J. Zoladz | Date: 05/12/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS/PFO<br>Transect ID: SVC23-W61/ SVC18-W61a<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 40 | | | | |
| *Typha latifolia* | H | OBL | 10 | | | | |
| *Impatiens capensis* | H | FACW | 10 | | | | |
| *Salix discolor* | S | FACW | 30 | | | | |
| *Salix fragilis* | T | FAC+ | 5 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 1 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0-12 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase): **Canandaigua silt loam**

Drainage Class **Very poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Mollic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | 2.5YR 4/8 | 20%, small, distinct | Saturated silty clay loam 40% | partly decomposed organic matter from 0-6 inches |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Mapped, observation, and flow_

Stream name (if known):
_S60, Unnamed tributary to Silver Creek_

Approximate distance to stream:
_Riparian_

What watershed is the delineated wetland within?
_SVC23 and SVC18_

Comments:
_Wetland drains to S60, which drains watershed SVC23_

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _A portion is within stream S60 channel_

**Rationale/Remarks:**

**Large, high value, PEM/PSS/PFO wetland, with high vegetative diversity, located within the banks of stream S60 until it widens out into a much broader wetland complex north of wetland flags W61-105 and W61-5. High groundwater recharge and discharge, wildlife habitat function and values. Nesting *Scolopax minor* observed. Inflow from south via stream S60 and from the east via drains D61 and D61a. Wetland W61 as well as stream S60 continues to the north beyond the corridor presumably reaching an unnamed tributary to Silver Creek. That northeastern portion overlaps into NYS DEC mapped wetland SC-13. It is assumed NYSDEC will take jurisdiction over entire wetland.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, R. Dutton, J. Zoladz | Date: 05/12/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC23-W62<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex sp.* | H | ≥FAC | 20 | | | | |
| *Toxicodendron radicans* | H | FAC | 30 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |
| *Acer rubrum* | T | FAC | 20 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 60%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: n/a inches<br>Depth to saturated soil: 4 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase):

**Niagara silt loam**

Taxonomy (subgroup) **Aeric Ochraqualfs**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 4/2 | 7.5YR 4/8 | 20%, small, distinct | Very moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

50 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC23

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☐ **discrete and confined**
- ☒ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PFO wetland with moderate vegetative diversity, located in a natural depression of a red maple forest. Receives surface water runoff from surrounding up-gradient areas and drains east to adjacent wetland W61 / stream S60 complex via drain D62. This wetland does not overlap with NYS DEC wetland SC-13 but drain D62 is a hydrological connection to wetland W61 which does overlap with NYSDEC wetland SC-13.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, R. Dutton, J. Zoladz | Date: 05/12/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: SVC23-W63<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex sp.* | H | ≥FAC | 30 | | | | |
| *Juncus effusus* | H | FACW+ | 10 | | | | |
| *Solidago sp.* | H | ≥FAC | 20 | | | | |
| *Onoclea sensibilis* | H | FACW | 10 | | | | |
| *Apocynum sp.* | H | ≤FAC | 20 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase):

**Niagara silt loam**

Taxonomy (subgroup) **Aeric Ochraqualfs**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 4/2 | 10YR 5/8 | 10%, moderate, distinct | Saturated silt clay | |
| 5-14 | B | 10YR 4/1 | 10YR 5/8 | 10%, moderate, distinct | Moist silt clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation, desktop review

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

500 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC23 and SVC18

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM wetland, with little vegetative diversity, located in a reverting agricultural field. Inflow via overland flow from surrounding up-gradient areas primarily from the east, and via drains D63 and D63a from the east. Drains north via discrete overland flow to wetland W60 ultimately reaching an unnamed tributary to Silver Creek. This wetland overlaps with NYSDEC wetland SC-13 slightly in the northwestern corner (wetland flag W63-8). It then drains into wetland W64, which also overlaps with NYSDEC wetland SC-13.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, R. Dutton, J. Zoladz | Date: 05/12/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: SVC23-W64<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex crinita* | H | OBL | 15 | *Lindera benzoin* | S | FACW- | 10 |
| *Toxicodendron radicans* | H | FAC | 30 | | | | |
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Acer rubrum* | T | FAC | 10 | | | | |
| *Ulmus americana* | T | FACW- | 10 | | | | |
| *Solidago rugosa* | H | FAC | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase):

**Niagara silt loam**

Taxonomy (subgroup) **Aeric Ochraqualfs**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 4/1 | 10YR 5/6 | 30%, moderate, distinct | Very moist silty clay with 40% partly decomposed organic matter |
| 8+ | B | 10YR 6/1 | 10YR 5/6 | 40%, moderate, distinct | Moist silt clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☒ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation, desktop review

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

400 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC23

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value PFO, with moderate vegetative diversity, located in natural depression in forested area. Inflow via overland flow and from wetland W63, and from drain D64 near wetland flag W64-3. The wetland extends west and drains west via drain D64 beyond the survey corridor into an unnamed tributary to Silver Creek. Approximately 50% of this wetland is overlapped with NYSDEC wetland SC-13 to the west. This wetland may connect to wetland W61 outside the survey corridor.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, R. Dutton, J. Zoladz | Date: 05/12/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS/PFO<br>Transect ID: SVC23-W65<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Fagus grandifolia* | S / T | FACU | 10 | *Toxicodendron radicans* | H | FAC | 20 |
| *Carex sp.* | H | ≥FAC | 15 | *Acer saccharum* | T | FACU | 10 |
| *Convallaria majalis* | H | FACU | 20 | *Acer rubrum* | T | FAC | 10 |
| *Smilax rotundifolia* | V | FAC | 10 | *Carex crinita* | H | OBL | 5 |
| *Lindera benzoin* | S | FACW- | 15 | | | | |
| *Juncus effusus* | H | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: >50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☒ Other: _film present_<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 11 inches | FAC Neutral: ☐ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 10 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase):

**Niagara silt loam**

Taxonomy (subgroup) **Aeric Ochraqualfs**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-2 | O | - | - | - | Organic material |
| 2-4 | A | 10YR 4/2 | - | - | Moist silt loam |
| 4-12+ | B | 10YR 6/2 | 7.5YR 5/6 | 40%, moderate, distinct | Clayey silt |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Observation, desktop review

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

~400 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

SVC23 and SVC18

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW**
- ☒ **P-RPW**
- ☐ **S-RPW**
- ☐ **Non-RPW**

Flow is:

- ☐ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate to large size, moderate to low value PFO wetland (pit and mound topography), with high vegetative diversity, located in natural depression in forested area. Receives discrete overland flow from surrounding up-gradient areas and the adjacent reverting agricultural field to the east. Drains south into wetland W64 during moderate/ heavy rain events. Additional drainage to west via discrete overland flow near wetland flag W65-37. Many large depressional areas throughout with water-stained leaves but no vegetation. This wetland does not overlap with NYSDEC wetland SC-13. However there is a direct surface connection to wetland W64 which does overlap with NYSDEC wetland SC-13.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/13/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS<br>Transect ID: WNC85-W66<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Soildago rugosa* | H | FAC | 40 | *Cornus sp.* | S | ≥FAC | 40 |
| *Juncus effusus* | H | FACW | 30 | | | | |
| *Glyceria striata* | H | OBL | 30 | | | | |
| *Onoclea sensibilis* | H | FACW | 25 | | | | |
| *Carex sp.* | H | ≥FAC | 30 | | | | |
| *Viburnum recognitum* | S | FCW- | 30 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam, Orpark silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14+ | A | 2.5Y 4/2 | 10YR 5/8 | 30%, large, distinct | Saturated clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation, desktop review

Stream name (if known):
Unnamed tributary to Walnut Creek

Approximate distance to stream:
600 feet

What watershed is the delineated wetland within?
Walnut Creek 85

Comments:
**Also located within WNC50, WNC84, and WNC86 but flows to WNC85**

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size and value PSS wetland with moderate vegetative diversity. Receives surface water runoff from up-gradient wetland outside the survey corridor and drains south to pond PO66 in a large natural depression surrounded by active and reverting agricultural fields. No surface connection to traditionally navigable waters to the south. May drain to the north into the roadside ditch along the south side of Hopper Road, then flowing northwest and through a culvert connecting it to an unnamed tributary to Walnut creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/13/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PFO<br>Transect ID: WNC89-W67<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15 | *Ulmus americana* | T | FACW- | 30 |
| *Soildago rugosa* | H | FAC | 15 | | | | |
| *Toxicodendron radicans* | H | FAC | 10 | | | | |
| *Juncus effusus* | H | FACW | 20 | | | | |
| *Acer rubrum* | T | FAC | 30 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 30 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

## SOILS

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-6 | A | 7.5YR 3/1 | 7.5YR 5/6 | 5%, small, distinct | Very moist silty clay loam |
| 6-14 | B | 2.5Y 5/2 | 10YR 5/6 | 30%, large, distinct | Slightly moist sandy clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation, desktop review

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

1000 feet

What watershed is the delineated wetland within?

WNC89

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate value PFO wetland, with moderate vegetative diversity, located on top of a slightly north-sloping hill. Receives surface water runoff from up-gradient areas and drains to the north via discrete overland flow to drain D1017 and to the west to an unnamed tributary to Walnut Creek. High groundwater recharge and discharge and wildlife habitat function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/13/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS/PFO<br>Transect ID: WNC91-W68<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | *Crataegus sp.* | T | ≤FAC | 5 |
| *Soildago rugosa* | H | FAC | 15 | *Rosa multiflora* | S | FACU | 5 |
| *Salix fragilis* | S | FAC+ | 10 | | | | |
| *Acer rubrum* | T | FAC | 5 | | | | |
| *Ulmus americana* | T | FACW- | 5 | | | | |
| *Viburnum recognitum* | S | FACW- | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 7 inches<br>Depth to saturated soil: 6 inches | Oxidized Root (live roots) Channels <12in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/1 | - | - | Very moist silty loam |
| 8-14 | B | 10YR 5/4 | 7.5YR 5/8 | 20%, small, distinct | Moist sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field Observation, desktop review

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

0.2 miles

What watershed is the delineated wetland within?

Walnut Creek91

Comments:

Flow relationship to associated stream:
- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PSS/PFO with moderate vegetative diversity, located on slightly northwest-sloping hillside. Receives surface water runoff from up-gradient areas and drains northwest via discrete overland flow to drain D1017 and ultimately to an unnamed tributary of Walnut Creek. Moderate groundwater recharge and discharge habitat function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PSS/PFO<br>Transect ID: WNC91-W69<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | *Ulmus americana* | T | FACW- | 10 |
| *Soildago rugosa* | H | FAC | 30 | *Lonicera sp.* | S | ≤FAC | 20 |
| *Solidago gigantea* | H | FACW | 40 | | | | |
| *Impatiens capensis* | H | FACW | 20 | | | | |
| *Viburnum recognitum* | S | FACW- | 30 | | | | |
| *Fraxinus pennsylvanica* | T | FACW | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches<br>Depth to saturated soil: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam, Asheville silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts/Typic Haplaquepts**

Drainage Class **Somewhat poorly drained/poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/1 | 10YR 5/6 | 2%, small, faint | Moist silty clay loam | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field and desktop review

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

0.5 mile

**Watershed Relationship**

What watershed is the delineated wetland within?

Walnut Creek 91

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, high value PSS wetland, with moderate vegetative diversity. Located within a forested area. Receives surface water runoff from up-gradient areas, via drains D69 and D69a, and large groundwater seep east of wetland flag W69-118. Drains to the northwest via discrete overland flow, also to drain D68 into wetland W68, and from near wetland flag W69-26 beyond the survey corridor to an unnamed tributary of Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forested area<br>Transect ID: WNC91-W70<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus effusus* | H | FACW+ | 30 | | | | |
| *Carex sp.* | H | ≥FAC | 40 | | | | |
| *Soildago rugosa* | H | FAC | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches<br>Depth to free water in pit: 6 inches<br>Depth to saturated soil: 5 inches | Oxidized Root (live roots) Channels <12 in.: ☐<br>FAC Neutral: ☒ | Local Soil Survey: ☒<br>Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10YR 2/2 | 10YR 5/8 | 3%, small, faint | Very moist silty clay loam | |
| 6-14 | B | 10YR 4/2 | 7.5YR 5/8 | 20%, small, distinct | Moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field and desktop review _____

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

0.5 miles

**Watershed Relationship**

What watershed is the delineated wetland within?

Walnut Creek 91

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**
☐ **confined** ☒ **overland sheet flow**
☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, low value PEM with little vegetative diversity associated with inundated ruts within an ATV trail. Receives surface water runoff from up-gradient areas and drains from east and west ends of the wetland via overland flow into wetland W69, ultimately draining to an unnamed tributary of Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WNC88-W71<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 90 | | | | |
| | | | | | | | |
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| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 10 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 8 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/1 | - | - | Very moist silty clay loam with 40% partly decomposed organic matter | |
| 8-14 | B | 10YR 3/2 | 10YR 5/8 | 5%, small, distinct | Moist silty clay loam | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation and desktop review

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

800 feet

What watershed is the delineated wetland within?

Walnut Creek 88

Comments:

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☒ **overland sheet flow**

☐ **other**

Explain:

**Rationale/Remarks:**

**Small, moderate value PEM with very low vegetative diversity, located in a natural depression within a reverting agricultural field. Receives surface water runoff from up-gradient areas and drains northeast via discrete overland flow during high flow events to drain D72a beyond the survey corridor. Moderate groundwater recharge and discharge function and value.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: WNC88-W72<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 25 | | | | |
| *Solidago gigantea* | H | FACW | 15 | | | | |
| *Carex sp.* | H | ≥FAC | 10 | | | | |
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Salix discolor* | S | FACW | 10 | | | | |
| *Cornus stolonifera* | S | FACW+ | 1 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10YR 3/1 | 5YR 5/8 | 5%, small, distinct | Saturated silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field and Desktop review

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

800 feet

What watershed is the delineated wetland within?

Walnut Creek 88

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value, linear PEM wetland, with low vegetative diversity, associated with a drainage swale within a reverting agricultural field. Receives surface runoff from up-gradient areas as well as from drain D72a from the south. Drains north via drain D72a to an unnamed tributary to Walnut Creek. Moderate groundwater recharge and discharge and wildlife habitat function and values.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): A. Francisco, A. Marciano | Date: 05/14/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WNC88-W73<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Phalaris arundinacea* | H | FACW | 90 | | | | |
| *Viburnum sp.* | S | ≥FAC | 5 | | | | |
| *Solidago rugosa* | H | FAC | 5 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☐<br>WQ if sat/inundated: **see below**<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: n/a inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: n/a inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks: (Drainage paterns) Soil very moist with mottles indicating fluctuating waterteble and periods of saturation.

## SOILS

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-14 | A | 2.5Y 3/2 | 7.5YR 5/8 | 1%, small, faint | Silt loam |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field and desktop review

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

1000 feet

What watershed is the delineated wetland within?

Walnut Creek 88

Comments:

Flow relationship to associated stream:

☒ **intermittent surface** ☐ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**

Flow is:

☐ **discrete** ☒ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**

Explain:

**Rationale/Remarks:**

**Small, low value PEM/PSS, with low vegetative diversity, associated with a natural depression within a reverting agricultural field. Inflow via drain D73 and adjacent up-gradient areas. Outflow north via drain D73 beyond the survey corridor to drain D72a, presumably to an unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Side of road | Community ID: PEM/PSS<br>Transect ID: WNC47-W103<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 30 | | | | |
| *Viburnum recognitum* | S | FACW- | 30 | | | | |
| *Solidago rugosa* | H | FAC | 60 | | | | |
| *Crataegus sp.* | T | ≤FAC | 30 | | | | |
| *Toxicodendron radicans* | H | FAC | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 80%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8 inches<br>Depth to saturated soil: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam, Orpark silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | 7.5YR 5/8<br>10YR 5/1 | 10%, small, distinct<br>2%, large, distinct | Moist silty clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?
_Field observation_

Stream name (if known):
_S103 (Unnamed tributary to Walnut Creek)_

Approximate distance to stream:
100 feet

**Watershed Relationship**

What watershed is the delineated wetland within?
WNC47

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate size and value, depressional PEM/PSS wetland with low vegetative diversity. Moderate wildlife habitat value. Inflow from surrounding up-gradient areas. Outflow north into stream S103 via drain D103a. Ultimately reaching an unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, A. Marciano | Date: 05/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Side of road | Community ID: PEM<br>Transect ID: WNC43-W104<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 20 | | | | |
| *Solidago rugosa* | H | FAC | 30 | | | | |
| *Impatiens capensis* | H | FACW | 10 | | | | |
| *Juncus effusus* | H | FACW+ | 20 | | | | |
| *Glyceria striata* | H | OBL | 60 | | | | |
| *Typha latifolia* | H | OBL | 5 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 2 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 2 inches<br>Depth to saturated soil: 2 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam, Orpark Silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 2.5YR 4/1 | 10YR 5/6 | 5%, small, faint | Moist silt loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?
Field observation

Stream name (if known):
Unnamed tributary to Walnut Creek

Approximate distance to stream:
100 feet

What watershed is the delineated wetland within?
WNC 30, 32, 33, 37, 38 and 43. Wetland drains to WNC43.

Comments:

Flow relationship to associated stream:
- ☒ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate value PEM wetland, with moderate vegetative diversity, located within historic logging ruts. Inflow via overland flow from up-gradient north slope. Outflow north via drain D104e and west via drains D104 and D014b to stream S103. *Phragmites australis* present near gas well.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, B. Smith | Date: 5/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☒ Yes ☐ No<br>Is the area a potential problem area? ☒ Yes ☐ No<br>Explanation of atypical or problem area: Car junk yard | Community ID: PEM<br>Transect ID: WNC59-W105<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 15% | | | | |
| *Impatiens capensis* | H | FACW | 70% | | | | |
| *Phalaris arundinacea* | H | FACW | 10% | | | | |
| *Ulmus rubra* | T | FAC- | 10% | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-6 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 12 inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam, Chautauqua silt loam, Alden mucky silt loam**
Taxonomy (subgroup) **Aeric Haplaquepts, Mollic Haplaquepts**

Drainage Class Moderately well drained/**Somewhat poorly drained/ very poorly drained**
Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-4 | A | 10YR 2/2 | 7.5YR 3/4 | Many large, distinct | Mucky clay, concretions | |
| 4-12 | B | 10YR 3/2 | 7.5YR 3/4 | Many large, distinct | Clay, concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**
Hydric soils present? ☒ **Yes** ☐ **No**
Wetland hydrology present? ☒ **Yes** ☐ **No**
Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?
_Field observation and desktop review_____
Stream name (if known):
___Unnamed tributary to Walnut Creek _____
Approximate distance to stream:
___1150 feet_____
What watershed is the delineated wetland within?
___WNC59_____
Comments:

Flow relationship to associated stream:
☐ **intermittent surface** ☒ **ephemeral surface**
☐ **perennial surface** ☐ **no surface flow**
Flow is:
☒ **discrete** ☐ **discrete and confined**
☐ **confined** ☐ **overland sheet flow**
☐ **other**
Explain: _____

**Rationale/Remarks:**

**Large, moderate value, linear PEM wetland, with low vegetative diversity. Wetland runs from western corridor edge in old growth forest downstream through automobile junkyard to the east corridor edge. Junkyard has vehicles in wetland areas. Some leaking petroleum products observed. Drains to east to unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, B. Smith | Date: 5/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WNC59-W106<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus tenuis* | H | FACW+ | 5% | | | | |
| *Phalaris arundinacea* | H | FACW | 50% | | | | |
| *Fescue spp.* | H | FACU | 5% | | | | |
| *Viburnum recognitum* | S | FACW+ | 20% | | | | |
| *Solidago spp.* | H | >FAC | 10% | | | | |
| *Acer rubrum* | T | FACW+ | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-3 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam, Orpark silt loam, Alden mucky silt loam, Mollic Haplaquepts**

Drainage Class **Somewhat poorly drained/very poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | 7.5YR 3/4 | Many small, distinct | Clay, concretions | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

__Desktop review_____

Stream name (if known):

__Unnamed tributary to Walnut Creek_____

Approximate distance to stream:

__1000 feet _____

**Watershed Relationship**

What watershed is the delineated wetland within?

____WNC59_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Moderate size, low value PEM/PSS wetland with low vegetative diversity. Wetland runs from west to the east through the entire corridor. Wetland is adjacent to old growth forest with hemlock, beech, and maple. Automobile junkyard located just north of wetland. Drains to an unnamed tributary to Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 5/23/08 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): D. Crawley, B. Smith | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM/PSS |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: TUC25-W107 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus tenuis* | H | FACW+ | 5% | | | | |
| *Phalaris arundinacea* | H | FACW | 50% | | | | |
| *Fescue spp.* | H | FACU | 5% | | | | |
| *Viburnum recognitum* | S | FACW+ | 20% | | | | |
| *Solidago spp/.* | H | >FAC | 10% | | | | |
| *Acer rubrum* | T | FACW+ | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: 0-3 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 3/1 | 7.5YR 3/4 | Many small, distinct | Clay, concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

__Field observation and desktop review _____

Stream name (if known):

Unnamed tributary to Tupper Creek_____

Approximate distance to stream:

__800 feet_____

What watershed is the delineated wetland within?

__TUC25_____

Comments:

_____

_____

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☒ **overland sheet flow**
- ☐ **other**

Explain: _No flow_____

**Rationale/Remarks:**

**Large, moderate value PEM/PSS wetland with low vegetative diversity. Area has been impacted by logging activities. Outflow via overland flow to large wet prairie to west, ultimately to unnamed tributary to Tupper Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, B. Smith | Date: 5/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM<br>Transect ID: TUC6-W108<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Typha latifolia* | H | OBL | 90 | | | | |
| *Onoclea sensibilis* | H | FACW+ | 5 | | | | |
| *Populus tremuloides* | T | FACU | 4 | | | | |
| *Viola spp.* | H | FAC | 1 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 75%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-12 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 12 inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam** Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions structure, etc. | |
|---|---|---|---|---|---|---|
| 0-12 | A | 10YR 2/1 | n/a | n/a | Mucky clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation__

Stream name (if known):

_S108 (Unnamed tributary to Tupper Creek)_____

Approximate distance to stream:

_Riparian_____

What watershed is the delineated wetland within?

_TUC6_____

Comments:

_____

_____

Flow relationship to associated stream:
- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:
- ☐ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Small, high value riparian PEM wetland with moderate vegetative diversity. Wetland has a medium sized pond area that drains down the side of a hill creating an elongated wetland, then comes to stream S108 that flows southwest to ultimately to Tupper Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, B. Smith | Date: 5/23/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☐ Yes ☒ No<br>Is the site significantly disturbed (atypical situation)? ☒ Yes ☐ No<br>Is the area a potential problem area? ☒ Yes ☐ No<br>Explanation of atypical or problem area: Cattle pasture | Community ID: PEM<br>Transect ID: TUC8-W109<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Juncus tenuis* | H | FAC- | 10 | | | | |
| *Fescue spp.* | H | FACU | 80 | | | | |
| *Medicago spp.* | H | FACU | 10 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: 0-2 inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 7 inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☐ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Ashville Silt Loam**

Drainage Class: **Poorly Drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Typic Haplaquepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10YR 3/1 | 7.5YR 3/4 | Many small, distinct | Clay | |
| 8-12 | B | 10YR 3/1 | n/a | n/a | Silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field Observation

Stream name (if known):

Unnamed tributary to Tupper Creek

Approximate distance to stream:

500 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

TUC8

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, low/ moderate value PEM wetland with low vegetative diversity. Wetland begins in cow pasture and flows east into red maple and viburnum area with herbs and grasses. Ultimately drains to unnamed tributary to Tupper Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, B. Smith | Date: 05/24/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Side of road | Community ID: PEM/PFO 1/4<br>Transect ID: SVC18-W110<br>Status: Isolated, however jurisdictional, see remarks |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Carex sp*. | H | ≥FAC | 80 | | | | |
| *Carpinus caroliniana* | T | FAC | 5 | | | | |
| *Acer saccharum* | T | FACU- | 10 | | | | |
| *Tsuga canadensis* | T | FACU | 5 | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 50%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☒ Water is clear ☒ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: 0-1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 12 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 0 inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase): **Canandaigua silt loam**

Taxonomy (subgroup) **Mollic Haplaquepts**

Drainage Class **Very poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-3 | O | 10YR 3/1 | - | - | Mucky material |
| 3-8 | A | 10YR 6/1 | 7.5YR 4/6 | Moderate, some, distinct | Clay |
| 8-12 | B | 10YR 5/3 | 7.5YR 4/6 | Large, abundant, distinct | Clay |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: A is striped matrix

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Desktop review

Stream name (if known):

Unnamed tributary to Silver Creek

Approximate distance to stream:

3300 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

Silver Creek 18

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

Located within NYS DEC wetland SC-12

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☐ **perennial surface** ☒ **no surface flow**

Is the associated stream reach:

- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☐ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☒ **other**

Explain: Isolated

**Rationale/Remarks:**

**Small to medium sized, low value PFO/PEM wetland with pit and mound topography and little vegetative diversity. Majority of wetland lies within NYSDEC Wetland SC-12. Therefore this wetland is under the jurisdiction of NYSDEC. North/northwest slope of topography suggests this wetland drains via overland flow north/northwest, ultimately to Silver Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): D. Crawley, B. Smith | Date: 05/24/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: Side of road | Community ID: PFO<br>Transect ID: SVC16-W111<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 40 | | | | |
| *Lycopodium lucidulum* | H | FACW- | 20 | | | | |
| *Osmunda cinnamomea* | H | FACW | 10 | | | | |
| *Tilia americana* | T | FACU | 20 | | | | |
| *Acer saccharum* | T | FACU- | 10 | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 6%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☒ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☒ Presence of litter<br>☒ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: <1 inches | Oxidized Root (live roots) Channels <12 in.: ☐ | Local Soil Survey: ☐ |
| Depth to free water in pit: 12 inches<br>Depth to saturated soil: 0 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase):

**Niagara silt loam**

Taxonomy (subgroup) **Aeric Ochraqualfs**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☐ Yes ☒ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | O | 10YR 2/1 | - | - | Mucky clay | |
| 5-12 | A | 10YR 4/1 | 7.5YR 5/6 | Moderate, many, distinct | Clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks: A is striped matrix

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Topographic Map analysis_____

_____

Stream name (if known):

_Unnamed tributary to Silver Creek_____

Approximate distance to stream:

_1000 meters_____

What watershed is the delineated wetland within?

_Silver Creek 16_ _____ _____ _____

Comments:

_Located within NYS DEC wetland SC-12_____

_Also located in Watersheds SVC12, SVC21, SVC22 and SVC23_

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _____

**Rationale/Remarks:**

**Large, low to moderate value PFO wetland typified by pit and mound topography, with little vegetative diversity. Flows west and northwest. Moderate to high value with high vegetative diversity and functionality. Majority of wetland lies within NYS DEC Wetland SC-12. Therefore wetland is under the jurisdiction of the NYSDEC.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 6/10/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco, A Kielaszek | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PFO |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: TUC25-W125 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Onoclea sensibilis | H | FACW | 15% | Betula alleganensis | T | FAC | 10% |
| Toxicodendron radicans | H | FAC | 60% | | | | |
| Caltha palustris | H | FACW | 20% | | | | |
| Carex crinita | H | OBL | 10% | | | | |
| Ulmus americana | T | FACW+ | 30% | | | | |
| Fraxinus pennsylvanica | T | FACW- | 30% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 6 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 6 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) **: Busti silt loam, Fremont silt loam, Chautauqua silt loam**

Drainage Class **Somewhat poorly drained/moderately well drained**

Taxonomy (subgroup) **Aeric Haplaquepts, Aquic Dystrochrepts**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-14 | A | 10yhr 2/1 | 2.5yr 3/6 | 10% large, distinct | Very moist, silty clay | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

What is this based on?

_Field Observation _____

Stream name (if known):

_Unnamed tributary to Tupper Creek _____

Approximate distance to stream:

_325 feet_____

What watershed is the delineated wetland within?

__TUC25_____

Comments:

_____

_____

Flow relationship to associated stream:

☐ **intermittent surface** ☒ **ephemeral surface**

☐ **perennial surface** ☐ **no surface flow**

Flow is:

☒ **discrete** ☐ **discrete and confined**

☐ **confined** ☐ **overland sheet flow**

☐ **other**

Explain: _ _____

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 6/10/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco, A Kielaszek | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PFO |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: TUC25-W126 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Onoclea sensibilis | H | FACW | 10% | Lindera benzoin | S | FACW- | 10% |
| Carex lupulina | H | OBL | 10% | Solidago rugosa | H | FAC | 15% |
| Caltha palustris | H | FACW | 15% | | | | |
| Impatiens capensis | H | FACW | 60% | | | | |
| Ulmus americana | T | FACW+ | 10% | | | | |
| Fraxinus pennsylvanica | T | FACW- | 10% | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 5 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: 5 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-6 | A | 10yr 3/1 | 10yr 5/3 | 3% small, faint | Moist, silty, clay loam | |
| 6-14+ | B | 10yr 6/2 | 7.5yr 6/8 | 10% large, distinct | Slightly moist, clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field observation _____

Stream name (if known):

_Unnamed tributary to Tupper Creek _____

Approximate distance to stream:

1000 feet_____

**Watershed Relationship**

What watershed is the delineated wetland within?

TUC25_____

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Comments:

_____

_____

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☒ **ephemeral surface**
- ☐ **perennial surface** ☐ **no surface flow**

Is the associated stream reach:

- ☐ **TNW** ☐ **P-RPW**
- ☒ **S-RPW** ☐ **Non-RPW**

Flow is:

- ☒ **discrete** ☒ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain: _____

**Rationale/Remarks:**

**Mapped portion is the western end of a moderate to large size, moderate value PFO, with high vegetative diversity; which extends northeast beyond survey corridor. Receives water via groundwater seepage and surface water runoff from up-gradient areas. Outflow west via drain D126 to Wetland W127 (an historic logging road that interrupts flow). Drain continues west and reverts to discrete overland flow and drain D126, to an unnamed tributary to Tupper Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark | Date: 6/10/2008 |
| Applicant/owner: Noble Environmental Power | County: Chautauqua |
| Investigator(s): A. Francisco, A Kielaszek | State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No | Community ID: PEM |
| Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No | Transect ID: TUC25-W127 |
| Is the area a potential problem area? ☐ Yes ☒ No | Status: Jurisdictional |
| Explanation of atypical or problem area: | |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| Onoclea sensibilis | H | FACW | 20% | | | | |
| Carex lupiulina | H | OBL | 20% | | | | |
| Glyceria striata | H | OBL | 35% | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 100%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐ on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| WQ if sat/inundated: ☒ Water is clear ☐ Presence of litter ☐ Water is turbid ☐ Other: _____ ☐ Oil Sheen present _____ | | |
| Depth of inundation: na inches | Oxidized Root (live roots) Channels <12in.: ☐ | Local Soil Survey: ☒ |
| Depth to free water in pit: 4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☒ |
| Depth to saturated soil: 4 inches | | |
| Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) : **Fremont silt loam, Valois gravelly silt laom**

Drainage Class **Somewhat poorly drained/well drained**

Field observations confirm mapped type? ☒ Yes ☐ No

Taxonomy (subgroup) **Aeric Haplaquepts/Typic Dystrochrepts**

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-8 | A | 10yr 3/1 | 2.5yr 3/6 | 30%, large distinct | Saturate Silt loam | |
| 8-14 | B | 10yr 6/2 | 10yr 6/8 | 15%, large distinct | Slightly moist clay loam | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

_Field Observation _____

Stream name (if known):

_Unnamed tributary to Tupper Creek

_____

Approximate distance to stream:

1000 feet_____

What watershed is the delineated wetland within?

__TUC25_____

Comments:

_____

_____

**Watershed Relationship**

Wetland is

- ☐ **Abutting**
- ☒ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☐ **P-RPW** ☒ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☐ **intermittent surface**
- ☒ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☒ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain: _ _____

**Rationale/Remarks:**

**Small, low value PEM, with little vegetative diversity; associated with wet logging road in upland forest. Receive water via drain D126 (from upgradient W126) and via discrete surface runoff. Drains west via drain D126 and reverts to discrete overland flow at adjacent logging road, ultimately reaching and unnamed tributary to Tupper Creek beyond survey corridor.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Windpark<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): B. Smith, A. Kielaszek | Date: 05/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM/PSS<br>Transect ID: WNC87-W606<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Vibernum recognitum* | T | FACW- | 40 | *Impatiens capensis* | H | FACW | 10 |
| *Salix fragilis* | T/S | FAC+ | 10 | *Glyceria striata* | H | OBL | 15 |
| *Juncus effuses* | H | FACW+ | 20 | *Salix discolor* | T/S | FACW | 10 |
| *Solidago spp.* | H | >FAC | 20 | *Acer rubrum* | T | FACW+ | 10 |
| *Rhus typhina* | T/S | NI | 15 | | | | |
| *Scirpus cyperinus* | H | FACW | 15 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 95%

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☐ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12 in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 3-4 inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Depth to saturated soil: at surface inches | | |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

## SOILS

Map Unit Name (Series and Phase) : **Fremont silt loam, Busti silt loam**

Taxonomy (subgroup) **Aeric Haplaquepts**

Drainage Class **Somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 10YR 3/2 | n/a | n/a | Silty clay |
| 5-12 | B | 10YR 4/4 | 7.5YR 5/8 | Many large, distinct | Silty clay |
| | | | | | |
| | | | | | |
| | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

What is this based on?

Field observation

Stream name (if known):

Unnamed tributary to Walnut Creek

Approximate distance to stream:

500 feet

**Watershed Relationship**

What watershed is the delineated wetland within?

Walnut Creek 87

Wetland is

- ☐ **Abutting**
- ☐ **Adjacent with surface connection**
- ☒ **Adjacent without surface connection**

Comments:

Is the associated stream reach delineated? ☐ **Yes** ☒ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

Flow relationship to associated stream:

- ☒ **intermittent surface**
- ☐ **ephemeral surface**
- ☐ **perennial surface**
- ☐ **no surface flow**

Flow is:

- ☒ **discrete**
- ☐ **discrete and confined**
- ☐ **confined**
- ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Moderate to large size, low to moderate value, PEM/PSS wetland with high vegetative diversity. Connects to Wetland W607, which drains north through Stream S607, an unnamed tributary of Walnut Creek.**

# Routine Wetland Determination

## DATA FORM

### 1987 Corps Wetland Delineation Manual

| | |
|---|---|
| Project/Site: Ball Hill Wind Park<br>Applicant/owner: Noble Environmental Power<br>Investigator(s): B. Smith, A. Kielaszek | Date: 05/22/08<br>County: Chautauqua<br>State: NY |
| Do normal circumstances exist on the site? ☒ Yes ☐ No<br>Is the site significantly disturbed (atypical situation)? ☐ Yes ☒ No<br>Is the area a potential problem area? ☐ Yes ☒ No<br>Explanation of atypical or problem area: | Community ID: PEM in forest<br>Transect ID: WNC92-W607<br>Status: Jurisdictional |

**VEGETATION** (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

| Dominant Plant Species | *Stratum | Indicator | % Cover | Dominant Plant Species | *Stratum | Indicator | % Cover |
|---|---|---|---|---|---|---|---|
| *Onoclea sensibilis* | H | FACW | 1 | *Glyceria striata* | H | OBL | 10 |
| *Impatiens capensis* | H | FACW | 80 | *Fraxinus pennsylvanica* | T | FACW | 15 |
| *Pepulus deltoides* | T | FAC | 5 | | | | |
| *Acer rubrum* | T | FACW+ | 5 | | | | |
| *Acer saccharum* | T | FACU- | 5 | | | | |
| *Solidago spp.* | H | >FAC | 10 | | | | |

**HYDROPHYTIC VEGETATION INDICATORS:**

% of dominants OBL, FACW, & FAC: 90

Remarks:

**Hydrophytic vegetation present?** ☒ Yes ☐ No

Rationale for decision/Remarks:

**HYDROLOGY**

| | | |
|---|---|---|
| Inundated: ☐ | Water Marks: ☐<br>on | Sediment Deposits: ☐ |
| Saturated in upper 12 in: ☒<br>WQ if sat/inundated:<br>☐ Water is clear ☐ Presence of litter<br>☐ Water is turbid ☐ Other: _____<br>☐ Oil Sheen present _____ | Drift Lines: ☐ | Drainage Patterns: ☒ |
| Depth of inundation: n/a inches | Oxidized Root (live roots) Channels <12in.: ☒ | Local Soil Survey: ☒ |
| Depth to free water in pit: 8inches<br>Depth to saturated soil: at surface inches | FAC Neutral: ☒ | Water-stained Leaves: ☐ |
| Check all that apply & explain below:<br>☐ Stream, lake or gage data<br>☐ Aerial photographs<br>☐ Other | Other (explain): | |

**Wetland hydrology present?** ☒ **Yes** ☐ **No**

Rationale for decision/remarks:

**SOILS**

Map Unit Name (Series and Phase) :

**Alden mucky silt loam, Asheville silt loam, Chautauqua silt loam**

Taxonomy (subgroup) **Mollic Haplaquepts, Typic Haplaquepts, Aquic Dystrochrepts**

Drainage Class **Very Poorly Drained/Poorly drained/somewhat poorly drained**

Field observations confirm mapped type? ☒ Yes ☐ No

**Profile Description**

| Depth (inches) | Horizon | Matrix color (Munsell moist) | Mottle colors (Munsell moist) | Mottle abundance size and contrast | Texture, concretions, structure, etc. | |
|---|---|---|---|---|---|---|
| 0-5 | A | 10YR 2/1 | n/a | n/a | Mucky mineral | |
| 5-12 | B | 10YR 3/1 | 7.5YR 4/6 | Many large, distinct | Silty clay with concretions | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Hydric Soil Indicators:** (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma
- ☒ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

**Hydric soils present?** ☒ **Yes** ☐ **No**

Rationale for decision/Remarks:

**Wetland Determination**

Hydrophytic vegetation present? ☒ **Yes** ☐ **No**

Hydric soils present? ☒ **Yes** ☐ **No**

Wetland hydrology present? ☒ **Yes** ☐ **No**

Is the sampling point within a wetland? ☒ **Yes** ☐ **No**

**Watershed Relationship**

Wetland is
- ☒ **Abutting**
- ☐ **Adjacent with surface connection**
- ☐ **Adjacent without surface connection**

Is the associated stream reach delineated? ☒ **Yes** ☐ **No**

Is the associated stream reach: ☐ **TNW** ☒ **P-RPW** ☐ **S-RPW** ☐ **Non-RPW**

What is this based on?

Field observation

Stream name (if known): S607

Unnamed tributary to Walnut Creek

Approximate distance to stream:

20 feet at closest distance within survey corridor, and abutting sout of survey corridor.

What watershed is the delineated wetland within?

WNC92

Comments:

**Also located within WNC59**

Flow relationship to associated stream:

- ☐ **intermittent surface** ☐ **ephemeral surface**
- ☒ **perennial surface** ☐ **no surface flow**

Flow is:

- ☒ **discrete** ☐ **discrete and confined**
- ☐ **confined** ☐ **overland sheet flow**
- ☐ **other**

Explain:

**Rationale/Remarks:**

**Large, moderate to high value PEM wetland with moderate vegetative diversity; located within a forested area and abutting S607, connecting beyond survey corridor. Inflow and outflow via stream S607 and S607a, an unnamed tributary to Walnut Creek.**

**FEATURE ID: WNC92-S607**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5/22/08

State: NY

Observers: B. Smith, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: small creek

Tributary is: Natural ☒ Manipulated ☐

Watershed: WNC92

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2'

Width (ft) (bank to bank) 2'

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID: WNC92-S607**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Onoclea sensibilis, Impatiens capensis* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 8-10 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 6-8 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: North | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W607 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? No | | | | |
| Description of Erosion: | | | | |

Comments:
Stream S607 is a very small creek, flowing north, associated with wetland W607. Flow transects survey corridor

**Rationale/Remarks:**

**Large, moderate to high value PEM wetland with moderate vegetative diversity; located within a forested area and abutting S607, connecting beyond survey corridor. Inflow and outflow via stream S607 and S607a, an unnamed tributary to Walnut Creek.**

**FEATURE ID : WNC30-S50**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5-8-08

State: NY

Observers: A. Francisco, A. Marciano, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: Short trib. _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___WNC30____

Stream Flow Direction __Northwest_____

Width (ft) (water's edge to water's edge) _12'-16'____

Width (ft) (bank to bank) _25'_____

**Bottom Characteristics**

Substrate Type
- ☒ Bedrock
- ☐ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☒ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☒ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WNC30-S50**

| Bank Height and Slope | Associated Habitat |
|---|---|
| Left Bank Ht* / Right Bank Ht*<br>☐ 0-3 ft. ☐ 0-3 ft.<br>☐ 3-6 ft. ☐ 3-6 ft.<br>☒ 6+ ft. ☒ 6+ ft.<br>About 50-60' on both sides<br>*Direction when facing downstream: _Northwest_ | Riparian Vegetation ☒ Yes ☐ No<br>If yes, list: *Phalaris arundinacea*<br>Approximate Riparian Width (facing d.s.) 8-10 ft left bank<br>8-10 ft right bank<br>Aquatic Vegetation ☐ Yes ☒ No<br>If yes, list: |
| Left Bank* / Bank Slope / Right Bank*<br>☐ 0 -20% (0-11°) ☐<br>☐ 21 – 50% (12-27°) ☐<br>☐ 51 -100% + (38-45°) ☐<br>☒ 100% + (46°+) ☒<br>Evidence of Pollution? _No_<br>Presence of Riffle/Run/Pools? _Yes_<br>Evidence of Erosion? _Yes_<br>Description of Erosion: _Exposed roots_ | Associated Wetland ☒ Yes ☐ No<br>If yes, list: W50<br>Aquatic Organisms ☐ Yes ☒ No<br>If yes, list: Water strider<br>Riparian/Terrestrial Organisms ☐ Yes ☒ No<br>If yes, list:<br>T&E Species ☐ Yes ☒ No<br>If yes, list:<br>Comments: |

Comments:

**Stream S50 is large perennial RPW with quick, steady flow. Predominantly upland vegetation with 60 foot banks on each side. Stream flows in a northwest direction to Walnut Creek.**

**FEATURE ID : WNC103-S54**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 05-08-08

State: NY

Observers: A. Francisco, A. Marciano, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _Well incised, narrow stream channel_

Tributary is: Natural ☒ Manipulated ☐

Watershed: _WNC103_____

Stream Flow Direction _North_____

Width (ft) (water's edge to water's edge) _24 inches____

Width (ft) (bank to bank) _5-7 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☒ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WNC103-S54**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☒ | 6+ ft. | ☒ | 6+ ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank<br>n/a ft right bank |
| *Direction when facing downstream: _North_ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W54 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Crayfish |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☒ | 100% + (46°+) | ☒ | | If yes, list: Water strider |
| Evidence of Pollution? _No_ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _Small_ | | | | If yes, list: |
| Evidence of Erosion? _Yes_ | | | | Comments: |
| Description of Erosion: _Undercutting, thalwegs_ | | | | |

Comments:

**Stream S54 is a small, well incised, narrow stream with steep banks. Starts from culvert at unmapped pond outside the survey corridor and flows northwest into wetland W54 about 50 feet west of stream S54a.**

**FEATURE ID : WNC103-S54a**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 05-09-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _See comments_____

Tributary is: Natural ☐ Manipulated ☒

Watershed: _WNC103_____

Stream Flow Direction _Northwest_____

Width (ft) (water's edge to water's edge) _2 feet____

Width (ft) (bank to bank) _2-4 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☒ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : WNC103-S54a**

| Bank Height and Slope | | Associated Habitat |
|---|---|---|
| Left Bank Ht* | Right Bank Ht* | Riparian Vegetation ☒ Yes ☐ No |
| ☐ 0-3 ft. | ☐ 0-3 ft. | If yes, list: *Onoclea sensibilis, Carex sp.* |
| ☐ 3-6 ft. | ☐ 3-6 ft. | |
| ☒ 6+ ft. | ☒ 6+ ft. | Approximate Riparian Width (facing d.s.) 0 ft left bank<br>4-6 ft right bank |
| *Direction when facing downstream: _Northwest_ | | Aquatic Vegetation ☐ Yes ☒ No |
| | | If yes, list: |
| Left Bank* | Right Bank* | Associated Wetland ☒ Yes ☐ No |
| Bank Slope | | If yes, list: W54 |
| ☐ 0 -20% (0-11°) | ☐ | Aquatic Organisms ☐ Yes ☒ No |
| ☐ 21 – 50% (12-27°) | ☐ | If yes, list: |
| ☐ 51 -100% + (38-45°) | ☐ | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☒ 100% + (46°+) | ☒ | If yes, list: |
| Evidence of Pollution? _Yes_ | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_ | | If yes, list: |
| Evidence of Erosion? _Yes_ | | Comments: |
| Description of Erosion: _Minor bank scour_ | | |

Comments:

**Unable to determine stream origin due to historic filling of channel with concrete debris (see photos P301 & P302). Additional household litter in stream channel from stream points S54a-1 to S54a-2. Staining not apparent at Transmission Line crossing at Stream Data Point SD54a. Stream S54a meets stream S54 at beginning of wetland W54 (main hydraulic input).**

**FEATURE ID : WNC103-S56**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 05-10-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _WNC103_____

Stream Flow Direction _West_____

Width (ft) (water's edge to water's edge) _3 feet_____

Width (ft) (bank to bank) _5 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WNC103-S56**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Onoclea sensibilis, Toxicodendron radicans, Equisetum arvense* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | |
| *Direction when facing downstream: _West_____ | | | | Approximate Riparian Width (facing d.s.) 8-10 ft left bank<br>0 ft right bank |
| | | | | Aquatic Vegetation ☒ Yes ☐ No |
| | | | | If yes, list: Unknown species |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W56 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Stream S56 flows west from roadside ditch east of Dennison Road, through culvert and becomes channelized. Mapped as stream S56 from culvert outflow continuing west beyond survey corridor after merging with stream S56a near the transmission line crossing.**

**FEATURE ID : WNC103-S56a**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 05-10-08

State: NY

Observers: A. Francisco, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _WNC103_____

Stream Flow Direction _Southwest_____

Width (ft) (water's edge to water's edge) _20 feet_____

Width (ft) (bank to bank) _25 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☐ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☒ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☒ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Chanel blows out to pond-like feature (20 feet x 40 feet)**

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WNC103-S56a**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | |
| | | | | Approximate Riparian Width (facing d.s.) n/a ft left bank |
| *Direction when facing downstream: _Southwest_____ | | | | n/a ft right bank |
| | | | | Aquatic Vegetation ☒ Yes ☐ No |
| | | | | If yes, list: Lemnaceae |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W56 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☒ | 21 – 50% (12-27°) | ☒ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Chanel blows out to pond-like feature (20 feet x 40 feet). Data point taken at southeast portion of ponded area. Flows southwest to stream S56 near transmission line crossing and then to an unnamed tributary to Walnut Creek.**

**FEATURE ID : SVC23-S60**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Silver Creek

Date: 05-12-08

State: NY

Observers: A. Francisco, R. Dutton, J. Zoladz

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _Divide between former field and forest_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: _SVC23_____

Stream Flow Direction _North_____

Width (ft) (water's edge to water's edge) _6 feet_____

Width (ft) (bank to bank) _8-10 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Channel expands into pond-like feature (20 feet x 40 feet)**

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : SVC23-S60**

## Bank Height and Slope

| Left Bank Ht* | | Right Bank Ht* | |
|---|---|---|---|
| ☒ | 0-3 ft. | ☒ | 0-3 ft. |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. |
| ☐ | 6+ ft. | ☐ | 6+ ft. |

*Direction when facing downstream: _North_____

| Left Bank* | Bank Slope | Right Bank* |
|---|---|---|
| ☒ | 0 -20% (0-11°) | ☒ |
| ☐ | 21 – 50% (12-27°) | ☐ |
| ☐ | 51 -100% + (38-45°) | ☐ |
| ☐ | 100% + (46°+) | ☐ |

Evidence of Pollution? _No_____
Presence of Riffle/Run/Pools? _No_____
Evidence of Erosion? _No_____
Description of Erosion: _____
Comments:

## Associated Habitat

Riparian Vegetation ☒ Yes ☐ No
If yes, list: *Viburnum recognitum, Acer rubrum,Ulmus americana, Salix sp., Solidago sp.*

Approximate Riparian Width (facing d.s.) 10 ft left bank
10 ft right bank

Aquatic Vegetation ☒ Yes ☐ No
If yes, list: Unknown, *Typha latifolia*

Associated Wetland ☒ Yes ☐ No
If yes, list: W60, W61

Aquatic Organisms ☐ Yes ☒ No
If yes, list:

Riparian/Terrestrial Organisms ☒ Yes ☐ No
If yes, list: Unknown snail species

T&E Species ☐ Yes ☒ No
If yes, list:
Comments:

Comments:
**Stream S60 is between former agricultural field and forested area. Flow comes from drainage of wetland W60. Outflow is to an unnamed tributary to Silver Creek.**

**FEATURE ID: WNC47-S103**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5/22/08

State: NY

Observers: D. Crawley, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: Walnut Creek 47

Stream Flow Direction Northwest

Width (ft) (water's edge to water's edge) 10 feet

Width (ft) (bank to bank) 25 feet

**Bottom Characteristics**

Substrate Type
- ☒ Bedrock
- ☐ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☒ **Intermediate** > 10 ft.; < 100 ft.
- ☐ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☒ veg. matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID: WNC47-S103**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank |
| ☒ | 6+ ft. | ☐ | 6+ ft. | n/a ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: Northwest | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W103 |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☒ | 100% + (46°+) | ☒ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? Yes | | | | |
| Description of Erosion: Exposed roots | | | | |

Comments:

Stream S103 is a large perennial stream, flows northwest with no live vegetation. Drain D1032 run into stream.

**FEATURE ID : TUC6-S108_____**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed Tributary to Tupper Creek

Date: 4/23/08

State: NY

Observers: D. Crawley, B. Smith

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: _Very small stream with wetland_____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ____Tupper Creek 6_____

Stream Flow Direction ____Southwest_____

Width (ft) (water's edge to water's edge) ____1-2_____

Width (ft) (bank to bank) _____1-2_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☒ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID : TUC6-S108_____**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Viola spp., Typha latifolia, Onoclea sensibilis, Phalaris spp.* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 5-20 ft left bank<br>5-20 ft right bank |
| *Direction when facing downstream: _Southwest | | | | Aquatic Vegetation ☒ Yes ☐ No<br>If yes, list: Viola spp. |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: W108 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☒ Yes ☐ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Snails |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☒ Yes ☐ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: Snails |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _Yes_____ | | | | If yes, list: |
| Evidence of Erosion? _Yes_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

Stream S108 is perennial stream, with moderate to high value, dominated by *Typha latifolia*, other species include sensitive fern and Viola spp.

**FEATURE ID: WNC92-S607**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5/22/08

State: NY

Observers: B. Smith, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: small creek

Tributary is: Natural ☒ Manipulated ☐

Watershed: WNC92

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2'

Width (ft) (bank to bank) 2'

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☐ Gravel
- ☐ Sand
- ☒ Silt/Clay
- ☐ Other

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☐ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☒ abrupt change in plant community

**FEATURE ID: WNC92-S607**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Onoclea sensibilis, Impatiens capensis* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | Approximate Riparian Width (facing d.s.) 8-10 ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | 6-8 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: North | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W607 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? No | | | | |
| Description of Erosion: | | | | |

Comments:
Stream S607 is a very small creek, flowing north, associated with wetland W607. Flow transects survey corridor

**FEATURE ID: WNC92-S607a**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5/22/08

State: NY

Observers: B. Smith, A. Kielaszek

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: WNC 92

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2'

Width (ft) (bank to bank) 4-6'

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☒ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☒ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID: WNC92-S607a**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☒ Yes ☐ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: *Impatiens capensis, Onoclea sensibilis, Solidago sp.* |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) 8-10 ft left bank<br>6-8 ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: North | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☒ Yes ☐ No |
| | Bank Slope | | | If yes, list: Wetland W607 |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? Yes | | | | If yes, list: |
| Evidence of Erosion? No | | | | |
| Description of Erosion: | | | | |

Comments:
Stream S607a is a minor stream flowing north though wetland W607 on the eastern section of the wetland.

**FEATURE ID : WNC106-S1014**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5-8-08

State: NY

Observers: A. Francisco, A. Marciano, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☒
S-RPW ☐ Non-RPW ☐

Perennial ☒ Intermittent ☐
Ephemeral ☐

Geometry: Meanders ☒ Rel. Straight ☐

Description: Short trib. _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___WNC106 and WNC28____

Stream Flow Direction _Northwest_____

Width (ft) (water's edge to water's edge) _3 feet____

Width (ft) (bank to bank) _6 feet_____

**Bottom Characteristics**

Substrate Type
- ☒ Bedrock
- ☐ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☒ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WNC106-S1014**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank<br>n/a ft right bank |
| *Direction when facing downstream: _Northwest____ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☒ | 0 -20% (0-11°) | ☒ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: Water strider |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _Yes_____ | | | | If yes, list: |
| Evidence of Erosion? _No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Stream S1014 is a P-RPW stream, which flows northwest. Stream crosses transmission line.**

**FEATURE ID : WNC106-S1014**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5-8-08

State: NY

Observers: A. Francisco, A. Marciano, J. Rupp

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: Short trib. _Small branch splitting from S1014_

Tributary is: Natural ☒ Manipulated ☐

Watershed: ___WNC106 and WNC28____

Stream Flow Direction _North_____

Width (ft) (water's edge to water's edge) _12 inches____

Width (ft) (bank to bank) _4 feet_____

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☐ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg matted down, bent or absent
- ☒ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☐ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☒ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID : WNC106-S1014**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☒ | 0-3 ft. | ☒ | 0-3 ft. | If yes, list: |
| ☐ | 3-6 ft. | ☐ | 3-6 ft. | |
| ☐ | 6+ ft. | ☐ | 6+ ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank<br>n/a ft right bank |
| *Direction when facing downstream: _North____ | | | | Aquatic Vegetation ☐ Yes ☒ No |
| | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☒ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☒ | 21 – 50% (12-27°) | ☒ | | If yes, list: Water strider |
| ☐ | 51 -100% + (38-45°) | ☐ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? _No_____ | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? _No_____ | | | | If yes, list: |
| Evidence of Erosion? _No_____ | | | | Comments: |
| Description of Erosion: _____ | | | | |

Comments:

**Small branch splitting from stream S1014 near stream point S1014-2 resulting high flow event. Reverts to groundwater at stream point S1014a-6.**

**FEATURE ID: WNC47-S2000**

**STREAM DATA SHEET**

County: Chautauqua

Stream Name: Unnamed tributary to Walnut Creek

Date: 5/22/08

State: NY

Observers: D. Crawley, A. Marciano

**Stream Characteristics**

Perceptible Flow ☒ Yes ☐ No

TNW ☐ P-RPW ☐
S-RPW ☒ Non-RPW ☐

Perennial ☐ Intermittent ☒
Ephemeral ☐

Geometry: Meanders ☐ Rel. Straight ☒

Description: _____

Tributary is: Natural ☒ Manipulated ☐

Watershed: Walnut Creek 47

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2 feet

Width (ft) (bank to bank) 5 feet

**Bottom Characteristics**

Substrate Type
- ☐ Bedrock
- ☒ Gravel
- ☐ Sand
- ☐ Silt/Clay
- ☐ Other

_____

Probed Stream Depth (if water present)
- ☒ 0 – 6"
- ☐ 7 – 12"
- ☐ 13 – 24"
- ☐ 25 -36"
- ☐ 37" +
- ☐ No perceptible depth

**Size Class**

- ☐ **Major** > 100 ft.
- ☐ **Intermediate** > 10 ft.; < 100 ft.
- ☒ **Minor** < 10 ft.

**Ordinary High Water Mark (OHWM) Indicators (CHECK ALL THAT APPLY):**

- ☒ clear, natural line impressed on the bank
- ☐ changes in the character of the soil
- ☐ shelving
- ☐ veg. matted down, bent or absent
- ☐ leaf litter disturbed or washed away
- ☐ sediment deposition
- ☒ water staining
- ☐ other:
- ☒ the presence of litter and debris
- ☐ destruction of terrestrial vegetation
- ☐ the presence of wrack line
- ☐ sediment sorting
- ☐ scour
- ☐ multiple observed or predicted flow events
- ☐ abrupt change in plant community

**FEATURE ID: WNC47-S2000**

| Bank Height and Slope | | | | Associated Habitat |
|---|---|---|---|---|
| Left Bank Ht* | | Right Bank Ht* | | Riparian Vegetation ☐ Yes ☒ No |
| ☐ | 0-3 ft. | ☐ | 0-3 ft. | If yes, list: |
| ☒ | 3-6 ft. | ☒ | 3-6 ft. | Approximate Riparian Width (facing d.s.) n/a ft left bank |
| ☐ | 6+ ft. | ☐ | 6+ ft. | n/a ft right bank |
| | | | | Aquatic Vegetation ☐ Yes ☒ No |
| *Direction when facing downstream: North | | | | If yes, list: |
| Left Bank* | | Right Bank* | | Associated Wetland ☐ Yes ☐ No |
| | Bank Slope | | | If yes, list: |
| ☐ | 0 -20% (0-11°) | ☐ | | Aquatic Organisms ☐ Yes ☒ No |
| ☐ | 21 – 50% (12-27°) | ☐ | | If yes, list: |
| ☒ | 51 -100% + (38-45°) | ☒ | | Riparian/Terrestrial Organisms ☐ Yes ☒ No |
| ☐ | 100% + (46°+) | ☐ | | If yes, list: |
| Evidence of Pollution? No | | | | T&E Species ☐ Yes ☒ No |
| Presence of Riffle/Run/Pools? No | | | | If yes, list: |
| Evidence of Erosion? No | | | | |
| Description of Erosion: | | | | |

Comments:
Stream S2000 is an intermittent stream, which flows north.

# Sector F

## Transmission Line

### Wetland Photos

W50, W51, W52, W53, W54, W56, W57, W58, W59, W60, W61, W61a, W62, W63, W64, W65, W66, W67, W68, W69, W70, W71, W72, W73, W103, W104, W105, W106, W107,W108, W109, W110, W111, W125, W126, W127, W606 and W607

### Drain Photos

D51, D51c, D51d, D51e, D53, D53a, D54, D55, D58, D58c, D59b, D60b, D63, D64, D66a, D66c, D69, D72, D73, D1015, D1016, D1017

### Stream Photos

S1014, S50, S54, S56, S56a, S60, S108, S607, S607a

### Pond Photos

PO66

### Turbine Location Photos

NA

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 23, 2008
Location P1587: Wetland W109
Direction of View: Northeast



Date: May 23, 2008
Location P1585: Wetland W108
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 23, 2008
Location P1586: Wetland W108 and Stream S108 (downstream)
Direction of View: Southwest



Date: June 10, 2008
Location P1666: Wetland W125 from between W125-9 and W125-10
Direction of View: Northwest



Date: June 10, 2008
Location P1667: Wetland W125-open from between W125-9 and W125-10
Direction of View: Southwest



Date: June 10, 2008
Location P1668: Wetland W125 from W125-20
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 10, 2008
Location P1669: Wetland W125 from W125-20
Direction of View: Northeast



Date: June 10, 2008
Location P1670: Drainage into Wetland W125 at W125-1open
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 10, 2008
Location P1671: North edge of Wetland W125
Direction of View: South



Date: June 10, 2008
Location P1672: Drain D126 entering Wetland W126 from WD126
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 10, 2008
Location P1673: Drain D126 leaving Wetland W126 at WD126
Direction of View: West



Date: June 10, 2008
Location P1674: Drain D126 inflow to Wetland W127 from W127-2
Direction of View: East



Date: June 10, 2008
Location P1675: Wetland W127 beyond upland forest from W127-2
Direction of View: North



Date: June 10, 2008
Location P1676: Drain D126 inflow to Wetland W127 at W127-2
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 23, 2008
Location P1583:  Wetland W107, at rutted logging road that leads to rest of W107
Direction of View: South



Date: May 23, 2008
Location P1584: Wetland W107, in cleared area
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 23, 2008
Location P1581: Wetland W106, upstream of flow
Direction of View: West



Date: May 23, 2008
Location P1582: Wetland W106, downstream of flow
Direction of View: East



Date: May 23, 2008
Location P1578: Pools on west side of Wetland W105
Direction of View: South



Date: May 23, 2008
Location P1579: Wetland W105 in junk yard
Direction of View: South



Date: May 23, 2008
Location P1580: Wetland W105 (upstream)
Direction of View: West



Date: May 22, 2008
Location P1004: Wetland W607
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 22, 2008
Location P1005: Wetland W607
Direction of View: Southeast



Date: May 22, 2008
Location P1006:  Wetland W607 and Stream S607 (upstream)
Direction of View: South



Date: May 22, 2008
Location P1007: Wetland W607 and Stream S607 (downstream)
Direction of View: North



Date: May 22, 2008
Location P1008: Stream S607a (downstream)
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 22, 2008
Location P1009: Eastern portion of Wetland W607 from Stream S607a
Direction of View: Southeast



Date: May 22, 2008
Location P1002: Wetland W606
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 22, 2008
Location P1003: Wetland W606
Direction of View: East



Date: May 14, 2008
Location P419: Wetland W73 from southeast of W73-1
Direction of View: North



Date: May 14, 2008
Location P415: Start of W72 beyond survey corridor
Direction of View: South



Date: May 14, 2008
Location P416: Wetland W72 as a broad swale from east of W72-11
Direction of View: North



Date: May 14, 2008
Location P417: Wetland W72 from east of W72-2
Direction of View: South



Date: May 14, 2008
Location P418: Wetland W72 and Drain D72 both continuing north beyond survey corridor

Direction of View: North



Date: May 14, 2008
Location P414: Wetland W71 from southeast of W71-10
Direction of View: Northwest



Date: May 14, 2008
Location P408: Wetland W70 and wet ATV trail from northwest of W70-14
Direction of View: Northwest



Date: May 14, 2008
Location P409: Wetland W70 from northwest of W70-14
Direction of View: East



Date: May 14, 2008
Location P411: Wetland W70 from north of W70-10
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 14, 2008
Location P413: Wetland W70 from north of W70-10
Direction of View: East



Date: May 14, 2008
Location P393: Trail along Wetland W69 from W69-25
Direction of View: East



Date: May 14, 2008
Location P394: Wetland W69 at W69-29 from trail
Direction of View: South



Date: May 14, 2008
Location P395: Wetland W69-26open from trail
Direction of View: West



Date: May 14, 2008
Location P396: East edge of Wetland W69 and Drain D69-1, from south of W69-10
Direction of View: North



Date: May 14, 2008
Location P397: West edge of Wetland W69 from south of W69-10
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 14, 2008
Location P398: Wetland W69 from south of W69-10
Direction of View: South



Date: May 14, 2008
Location P399: Wetland W69 from south of W69-10
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 14, 2008
Location P402: Wetland W69 from WD69
Direction of View: South



Date: May 14, 2008
Location P403: Wetland W69 from WD69
Direction of View: Northwest



Date: May 14, 2008
Location P405: Wetland W69, wet road to right, Drain D69 on left, from W69-104
Direction of View: Southwest



Date: May 14, 2008
Location P406: Wetland W69 extending into open wet field with large groundwater seep
Direction of View: Southeast



Date: May 14, 2008
Location P407: Drain D69 going north along trail
Direction of View: North



Date: May 14, 2008
Location P400: Start of Drain D69
Direction of View: North



Date: May 14, 2008
Location P391: Wetland W68 where it drains to ummapped stream
Direction of View: Northwest



Date: May 14, 2008
Location P392: Wetland W68 “open” between W68-10 and -11b
Direction of View: Northwest



Date: May 13, 2008
Location P385: Wetland W67 and Snowmobile trail at Transmission line crossing, from W67-10
Direction of View: North



Date: May 13, 2008
Location P386: Wetland W67 and Snowmobile trail at Transmission line crossing, from W67-10
Direction of View: South



Date: May 13, 2008
Location P387: Wetland W67 from 50 feet northeast of SD67
Direction of View: North



Date: May 13, 2008
Location P388: Wetland W67 from 50 feet northeast of SD67
Direction of View: West



Date: May 13, 2008
Location P389: Wetland W67 from 50 feet northeast of SD67
Direction of View: South



Date: May 13, 2008
Location P390: Wetland W67 from 50 feet northeast of SD67

Direction of View: East



Date: May 13, 2008
Location P382: Drain D1017 and new gas well at Transmission line crossing
Direction of View: North



Date: May 13, 2008
Location P383: Gas well road from Transmission line crossing and Drain D1017
Direction of View: East



Date: May 13, 2008
Location P381: Drain D1017 from Transmission line crossing
Direction of View: East



Date: May 13, 2008
Location P380: Drain D1017 from Transmission line crossing
Direction of View: West



Date: May 13, 2008
Location P374: South end of Wetland W66 across gas line and extending beyond survey corridor
Direction of View: East



Date: May 13, 2008
Location P375: Wetland W66 and snowmobile trail from north of W66-5
Direction of View: South



Date: May 13, 2008
Location P376: Wetland W66 at W66-15 where discrete drain D66a flows southwest
Direction of View: East



Date: May 13, 2008
Location P377: Wetland W66 at edge of field and Drain D66c draining west
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 13, 2008
Location P378: Southwest corner of Wetland W66, Pond PO66 is the cottonwoods
Direction of View: Southeast



Date: May 13, 2008
Location P379: Pond PO66 from edge of snowmobile trail
Direction of View: Northwest



Date: June 12, 2008
Location (P563): Wetland W103 from south of WD103
Direction of view: Northeast



Date: June 12, 2008
Location (P564): Wetland W103 south of WD103
Direction of view: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 12, 2008
Location (P1684): North portion of Wetland W104 from Transmissions Line crossing
Direction of view: North



Date: June 12, 2008
Location (P1685): North portion of Wetland W104 from Transmission line center line
Direction of view: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 12, 2008
Location (P1683): Wetland W104 from WD104
Direction of view: South



Date: June 12, 2008
Location (P1686): Wetland W104 from WD104
Direction of view: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: June 12, 2008
Location (P570): Wetland W104 from WD104
Direction of view: North



Date: June 12, 2008
Location (P571): Wetland W104 from WD104
Direction of view: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P266: Stream S50 from SD50 and Transmission Line crossing
Direction of View: East Southeast



Date: May 8, 2008
Location P267: Stream S50 from SD50 and Transmission Line crossing
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P269:  Wetland W50 from W50-1
Direction of View: Southwest



Date: May 8, 2008
Location P270: Drain D51 and west edge of Wetland W51 from south of W51-7
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P271: Wetland W51 from south of W51-7
Direction of View: East



Date: May 8, 2008
Location P272: Drain D51 from south of W51-7
Direction of View: West



Date: May 8, 2008
Location P273: Drain D51d from D51d-6
Direction of View: South Southeast



Date: May 8, 2008
Location P274: Drain D51c from D51d-6
Direction of View: Southeast



Date: May 8, 2008
Location P275: Drain D51c from D51d-6
Direction of View: North



Date: May 8, 2008
Location P276: Drain D51c and D51d confluence
Direction of View: Northwest



Date: May 8, 2008
Location P277: Drain D51e from D51e-6
Direction of View: Southeast



Date: May 8, 2008
Location P278: Drain D51e (ephemeral gully) from D51e-6
Direction of View: Northwest



Date: May 8, 2008
Location P279: Stream S1014 (downstream) from S1014-2
Direction of View: Northwest



Date: May 8, 2008
Location P281: Stream S1014 (upstream) from S1014-2
Direction of View: Southeast



Date: May 8, 2008
Location P282: Stream S1014 (downstream) from Transmission line crossing
Direction of View: Northwest



Date: May 8, 2008
Location P283: Stream S1014 (upstream) from Transmission line crossing
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P280: Stream S1014a start from S1014-2
Direction of View: North



Date: May 8, 2008
Location P284: Stream S1014a (downstream) from SD1014a
Direction of View: Northwest



Date: May 8, 2008
Location P285: Stream S1014a (upstream) from SD1014a
Direction of View: Southeast



Date: May 8, 2008
Location P287: Wetland W52 from southwest of W52-1a
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P288: Drain D52 inflow to Wetland W52
Direction of View: South



Date: May 8, 2008
Location P289: Wetland W53 inflow from D1014 from W53-19
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P290: Wetland W53 inflow from D1014 from W53-19
Direction of View: Northeast



Date: May 8, 2008
Location P291: Wetland W53 from W53-17
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P292: Wetland W53 from W53-17
Direction of View: Northeast



Date: May 8, 2008
Location P293: Drain D53 inflow to Wetland W53 from south of W53-11
Direction of View: North



Date: May 8, 2008
Location P294: Drain D53a inflow to Wetland W53
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P295: Railroad bed from Transmission line crossing
Direction of View: Northeast



Date: May 8, 2008
Location P296: Railroad bed from Transmission line crossing
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 8, 2008
Location P297: Drain D1015 start at Transmission line crossing
Direction of View: Northeast



Date: May 8, 2008
Location P298: Drain D1015 down gradient on Transmission Line crossing
Direction of View: Northwest



Date: May 8, 2008
Location P299: Stream S54 from SD54
Direction of View: South



Date: May 8, 2008
Location P300: Stream S54 from SD54
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P301: At top of huge concrete fill/rubble pile that has been dumped into Stream S54.
Bottom of pile is start of S54a approximately 15 feet below pile
Direction of View: North



Date: May 9, 2008
Location P302: Looking up the fill pile and heavily iron stained water at Stream S54a-1
Direction of View: South



Date: May 9, 2008
Location P303: Stream S54a (downstream) with heavily iron stained water from S54a-1
Direction of View: North



Date: May 9, 2008
Location P323: Stream S54a (upstream) from SD54a
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P324: Stream S54a (downstream) from SD54a
Direction of View: North



Date: May 9, 2008
Location P304: Drain D54 where it reverts to D.O.F
Direction of View:

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P306: East side of Wetland W54 where D.O.F draws into it from D54-3
Direction of View: West



Date: May 9, 2008
Location P307: Stream S54 enters at W54-154
Direction of View: South



Date: May 9, 2008
Location P308: Location where Streams S54 and S54a merge at northeast of W54-153
Direction of View: West



Date: May 9, 2008
Location P310: Trash pile within Wetland W54
Direction of View: Northwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P309: Wetland W54 and Stream S54 from trash pile
Direction of View: South



Date: May 9, 2008
Location P311: Wetland W54 and Stream S54 (blow cut)
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P305: Upland Datapoint UD54
Direction of View: Northeast



Date: May 9, 2008
Location P312: Groundwater seep near Upland Datapoint UD54
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P313: Groundwater seep near W54-10 and -11
Direction of View: Northwest



Date: May 9, 2008
Location P314: Upland Datapoint UD54a, wet field
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P315: Upland Datapoint UD54a, wet field
Direction of View: West



Date: May 9, 2008
Location P316: Wetland W54 from WD54 and northwest of W54-17
Direction of View: South



Date: May 9, 2008
Location P317: Wetland W54 from WD54 and northwest of W54-17
Direction of View: North



Date: May 9, 2008
Location P319: Wetland W54 and Stream S54 from W54-24
Direction of View: South

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 9, 2008
Location P320: North portion of Wetland W54 in reverting field from culvert
Direction of View: Northeast



Date: May 9, 2008
Location P321: North portion of Wetland W54 and Stream S54 draining west to culvert
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 10, 2008
Location P325: Stream S56 from culvert
Direction of View: Northwest



Date: May 13, 2008
Location P372: Drain D1016 from Stream S56-3 where it blows out
Direction of View: South



Date: May 13, 2008
Location P373: Drain D1016 blowing out to Stream S56a
Direction of View: Northwest



Date: May 13, 2008
Location P370: Ponded portion of Stream S56a
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 13, 2008
Location P371: Stream S56a draining to S56
Direction of View: Southeast



Date: May 10, 2008
Location P326: Wetland W56 and Stream S56 from W56-10
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 10, 2008
Location P327: Wetland W56 from west of WD56
Direction of View: East



Date: May 10, 2008
Location P328: Wetland W56 from west of WD56
Direction of View: Southwest



Date: May 10, 2008
Location P329: Wetland W57 from W57-6
Direction of View: East



Date: May 10, 2008
Location P330: Wetland W57 from W57-6
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 10, 2008
Location P331: Pond PO58 from southwest edge
Direction of View: Northeast



Date: May 10, 2008
Location P332: Pond PO58 and beaver dam.  Drain D58 drains through dam to Wetland W58
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 10, 2008
Location P333: Wetland W58 from WD58
Direction of View: North



Date: May 10, 2008
Location P334: Wetland W58 from WD58
Direction of View: West

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 10, 2008
Location P335: Wetland W58 from WD58
Direction of View: South



Date: May 10, 2008
Location P337: Wetland W58 from W58-14
Direction of View: North



Date: May 10, 2008
Location P338: Wetland W59 and Drain D58b inflow from W59-1
Direction of View: North



Date: May 10, 2008
Location P339: Wetland W59 and WD59 from W59-5
Direction of View: Southeast



Date: May 10, 2008
Location P340: Wetland W59 and Drain D59 from east of W59-11
Direction of View: South



Date: May 10, 2008
Location P341: Wetland W59 and Drain D59 from east of W59-11
Direction of View: North



Date: May 12, 2008
Location P342: Drain D60a from D60a-1
Direction of View: East Northeast



Date: May 12, 2008
Location P343: West edge of Wetland W60 from southeast of W60-21
Direction of View: Northeast



Date: May 12, 2008
Location P344: West edge of Wetland W60 and upland area beyond survey corridor
Direction of View: Northwest



Date: May 12, 2008
Location P345: Wetland W60 draining northwest beyond survey corridor, at W60-25
Direction of View: Northwest



Date: May 12, 2008
Location P346: Wetland W60 from W60-25
Direction of View: South



Date: May 12, 2008
Location P347: Drain D58c transition to D60b east side of Wetland W60
Direction of View: North



Date: May 12, 2008
Location P348: Wetland W60 from south of Drain D60b-4open
Direction of View: North



Date: May 12, 2008
Location P349: Wetland W60 from south of Drain D60b-4open
Direction of View: West



Date: May 12, 2008
Location P350: Wetland W60 from south of Drain D60b-4open
Direction of View: South



Date: May 12, 2008
Location P351: Wetland W60 from south of Drain D60b-4open
Direction of View: East



Date: May 12, 2008
Location P352: Stream S60 (upstream) from SD60
Direction of View: South



Date: May 12, 2008
Location P353: Stream S60 (downstream) from SD60
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 12, 2008
Location P354: Wetland W62 from north of W62-3a
Direction of View: South



Date: May 12, 2008
Location P355: Wetland W62-1 draining to Stream S60 from north of W62-3a
Direction of View: East

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 12, 2008
Location P356: Riparian portion of Wetland W61 and Stream S60
Direction of View: South



Date: May 12, 2008
Location P357: North end of Wetland W60, PEM/PSS portion from between W60-105 and -5
Direction of View: North



Date: May 12, 2008
Location P358: Wetland W61a from east of W61a-3
Direction of View: Northwest



Date: May 12, 2008
Location P359: East edge of Wetland W61 from east of W61-24
Direction of View: Southeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 12, 2008
Location P360: Wetland W61 from east of W61-24
Direction of View: West



Date: May 12, 2008
Location P361: Wetland W61, outflow from agricultural swale, from W61-14a
Direction of View: North

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 12, 2008
Location P362: Wetland W63 and Drain D63 from north of W63-9
Direction of View: East



Date: May 12, 2008
Location P363: Wetland W64 and Drain D64 from 10 feet east of W64-3
Direction of View: West



Date: May 12, 2008
Location P364: Wetland W64 from west of W64-1
Direction of View: North



Date: May 13, 2008
Location P365: Wetland W65 at wet logging road, southwest of W65-13
Direction of View: Northeast



Date: May 13, 2008
Location P366: Wetland W65, brush pile in wetland from southwest of W65-13
Direction of View: Northwest



Date: May 13, 2008
Location P367: Wetland W65, brush pile in wetland, from W65-13
Direction of View: West



Date: May 13, 2008
Location P368: Wetland W65, wet logging road, from southwest of W65-13
Direction of View: Southeast



Date: May 13, 2008
Location P369: Wetland W65 and brush pile from northeast of W65-38
Direction of View: Northeast

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



Date: May 24, 2008
Location P1588: Wetland W110
Direction of View: Northwest



Date: May 24, 2008
Location P1589: Wetland W111
Direction of View: Southwest

Ball Hill Wind Energy Park
Wetland Photolog
Spring 2008



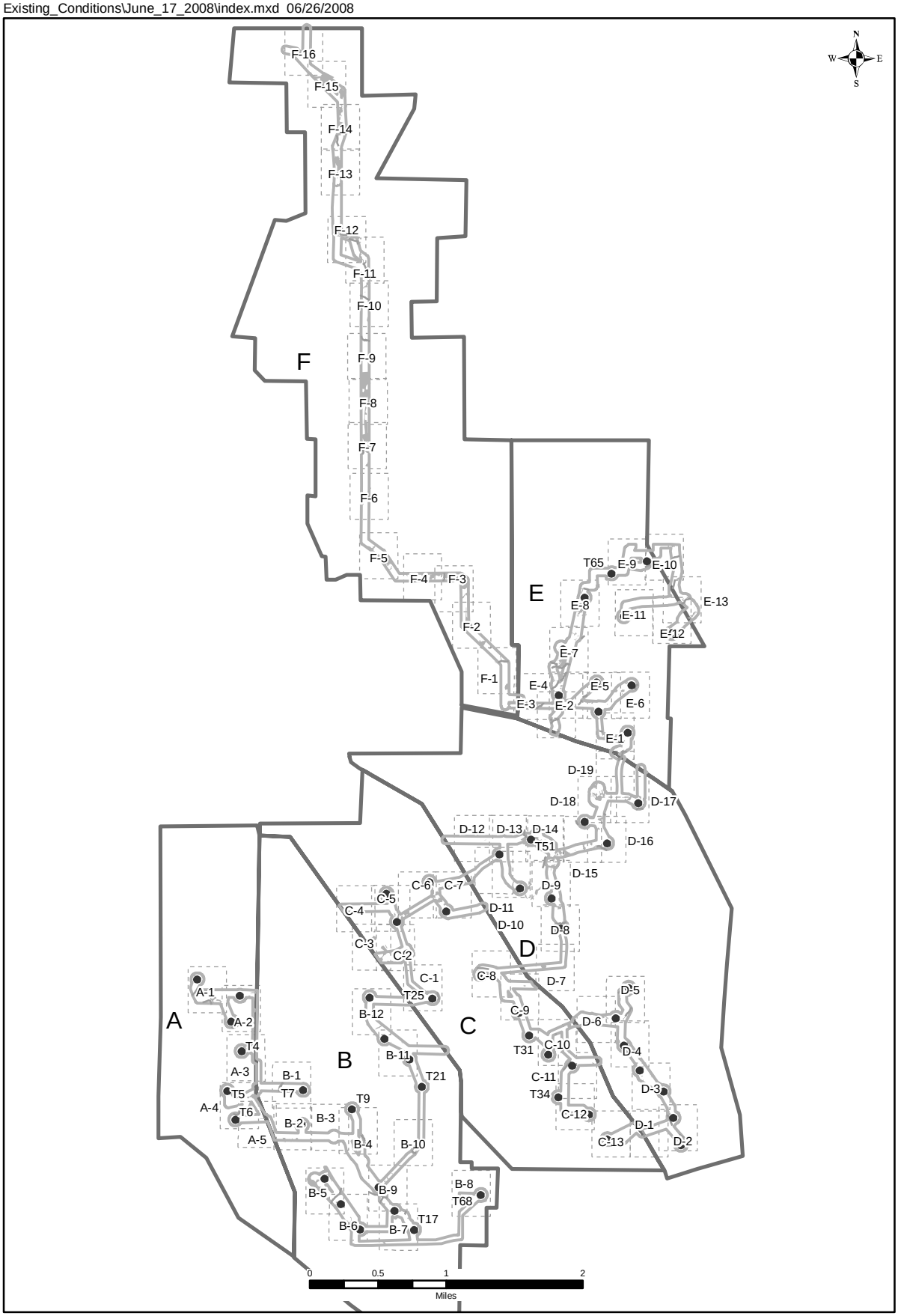
Date: May 24, 2008
Location P1590: Wetland W111
Direction of View: Northwest



Date: May 24, 2008
Location P1591:
Direction of View:

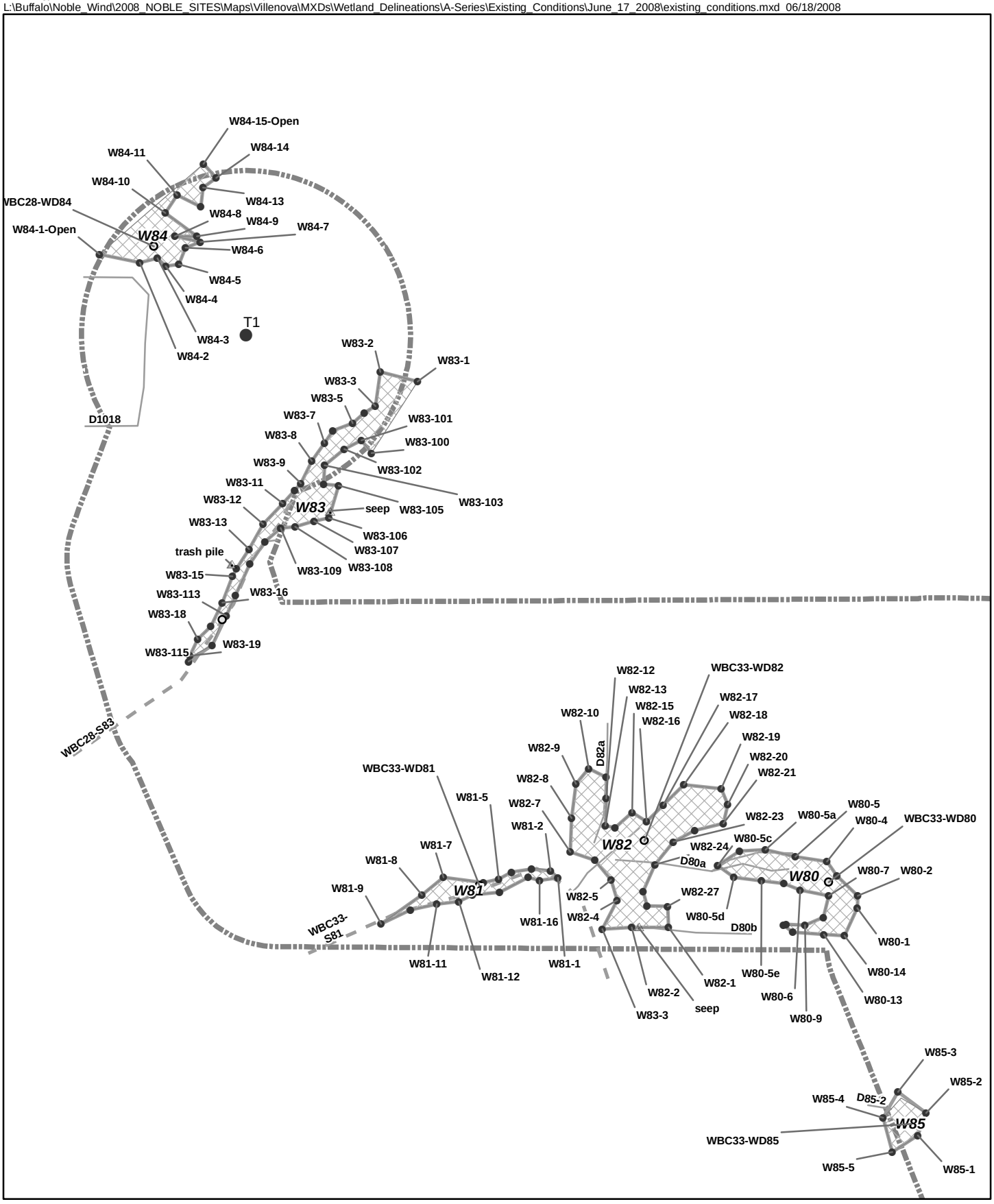
# G Maps – Existing Conditions

© Ecology & Environment, Inc. GIS Department Project #\Buffalo\Noble_Wind\
2008_NOBLE_SITES\Maps\Villenova\MXDs\Wetland_Delineations\A-Series\
Existing_Conditions\June_17_2008\index.mxd 06/26/2008




- Turbine (06-10-2008)
- Field Delineated Stream
- Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)
- Sector
- Map Index

Ball Hill Windfarm
Wetland Delineations
Map Series Index
August 16, 2008




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

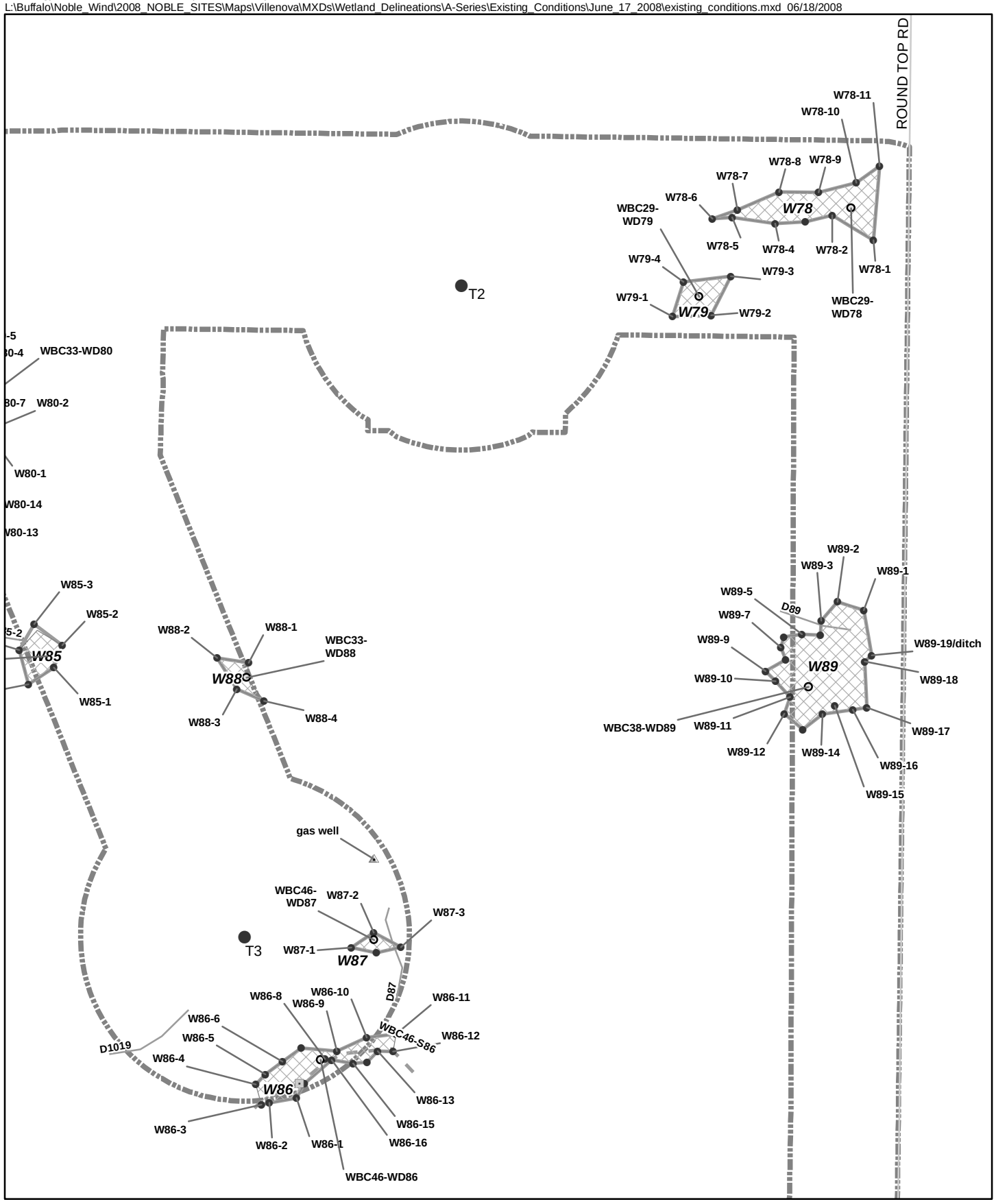
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame A-1
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

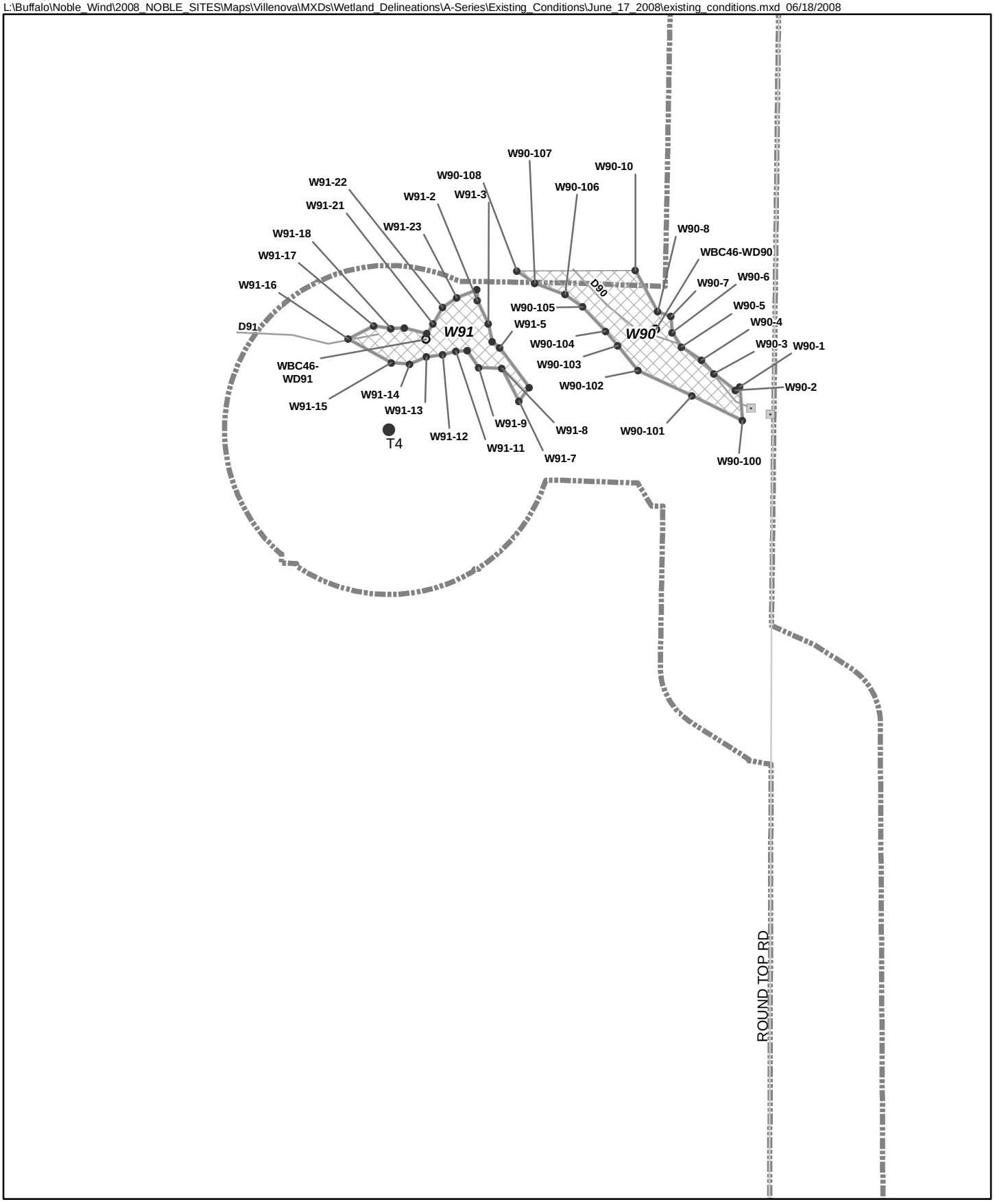
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame A-2
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet



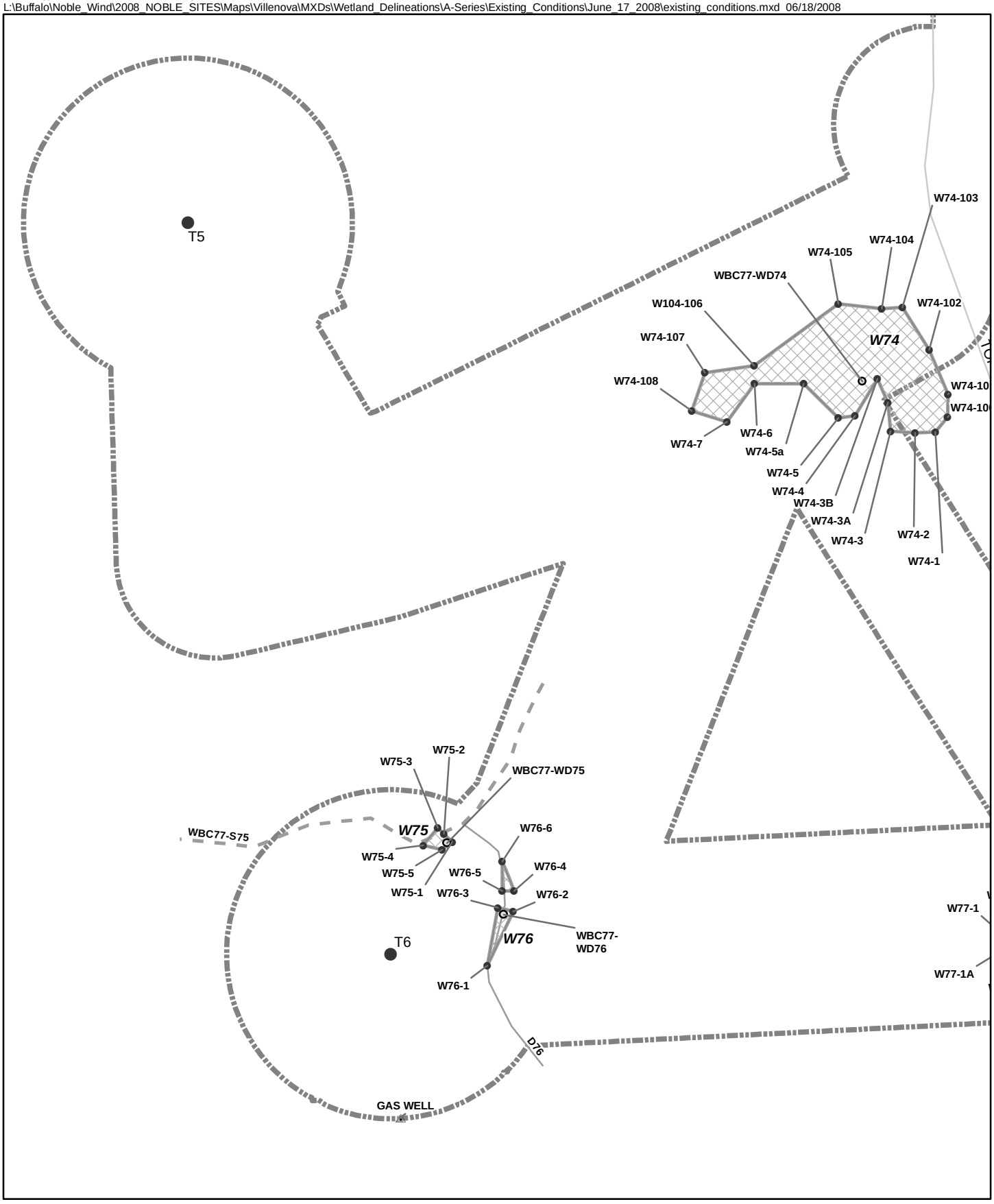

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame A-3
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

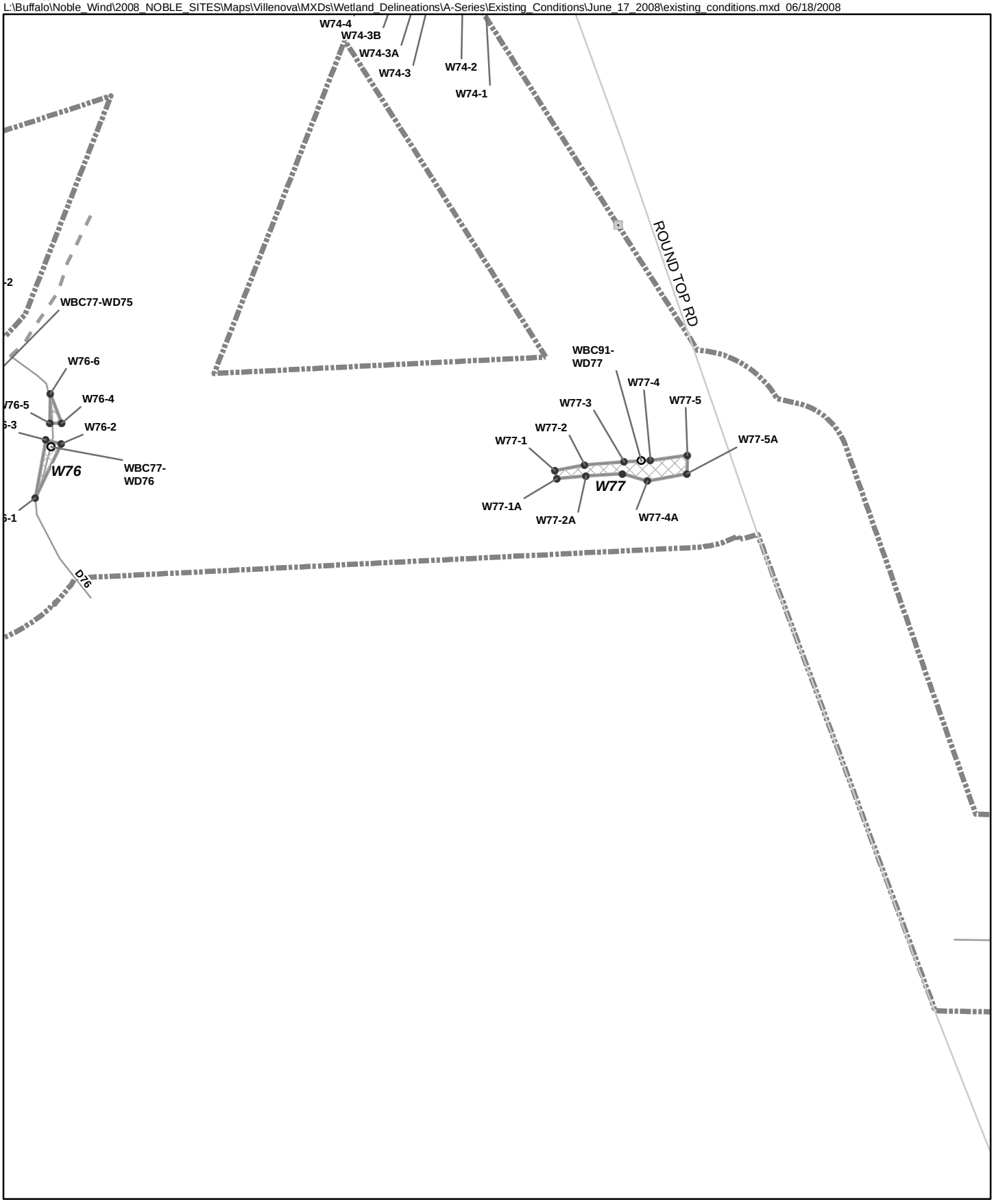
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame A-4
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet



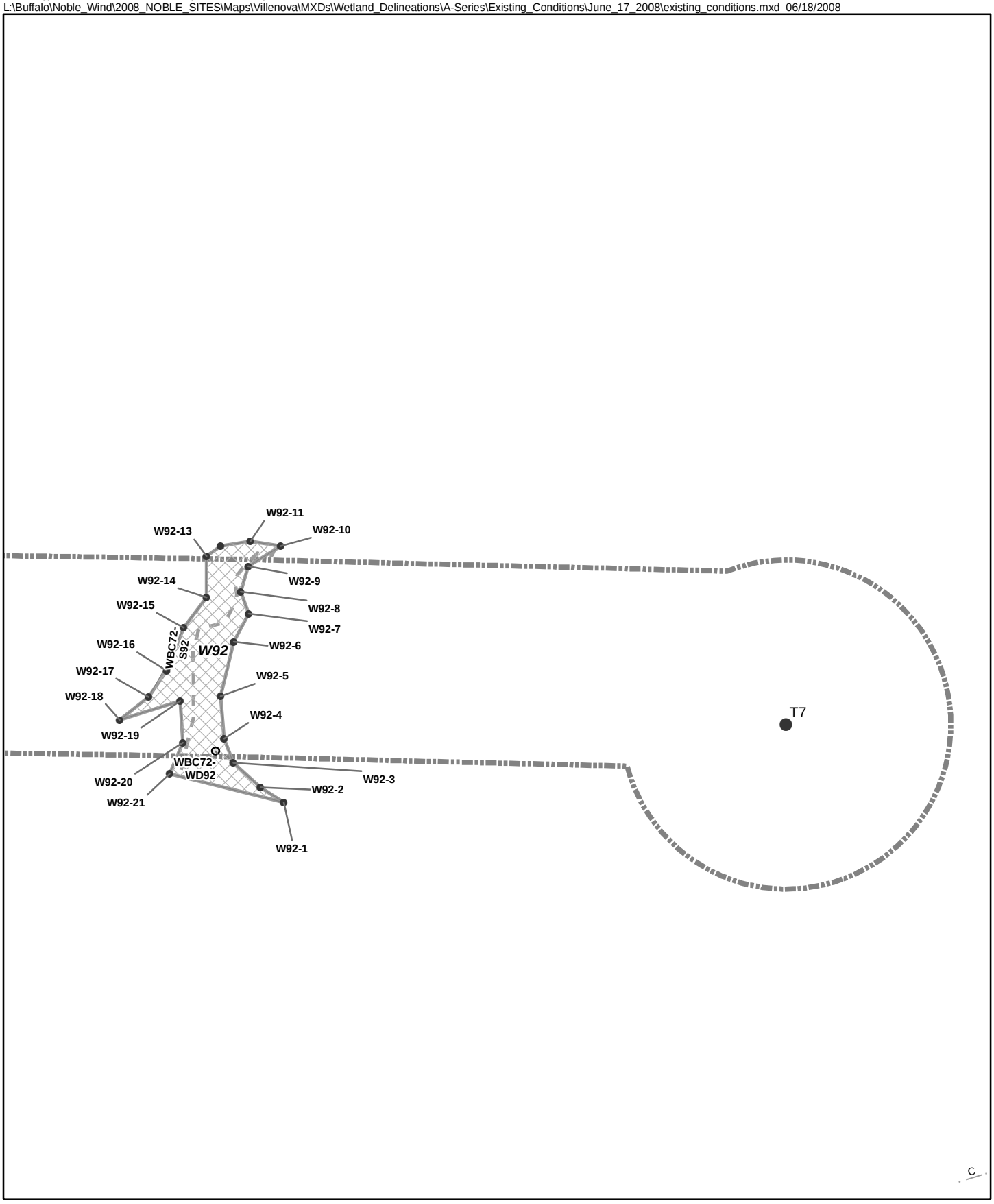

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame A-5
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

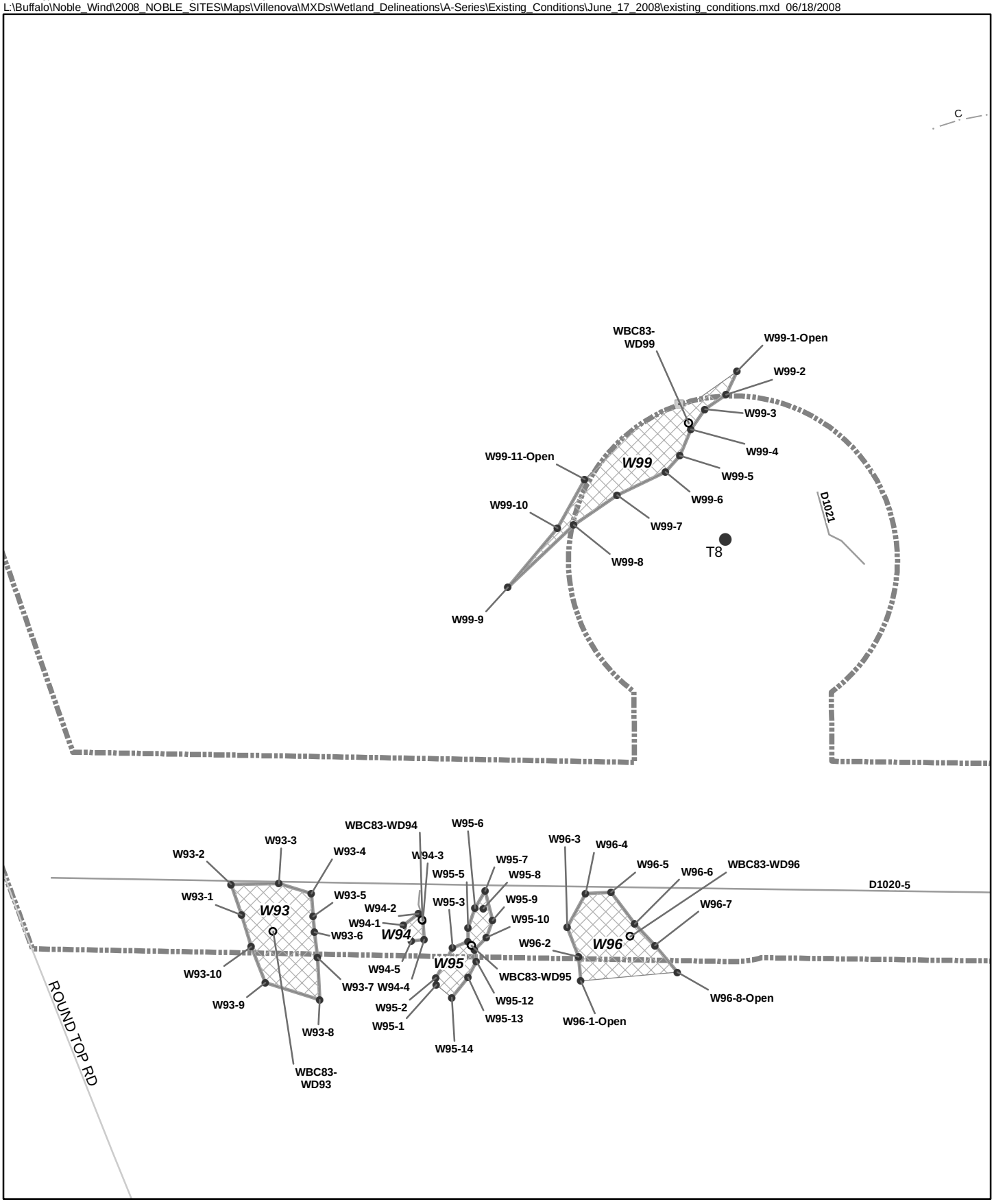
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame B-1
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet



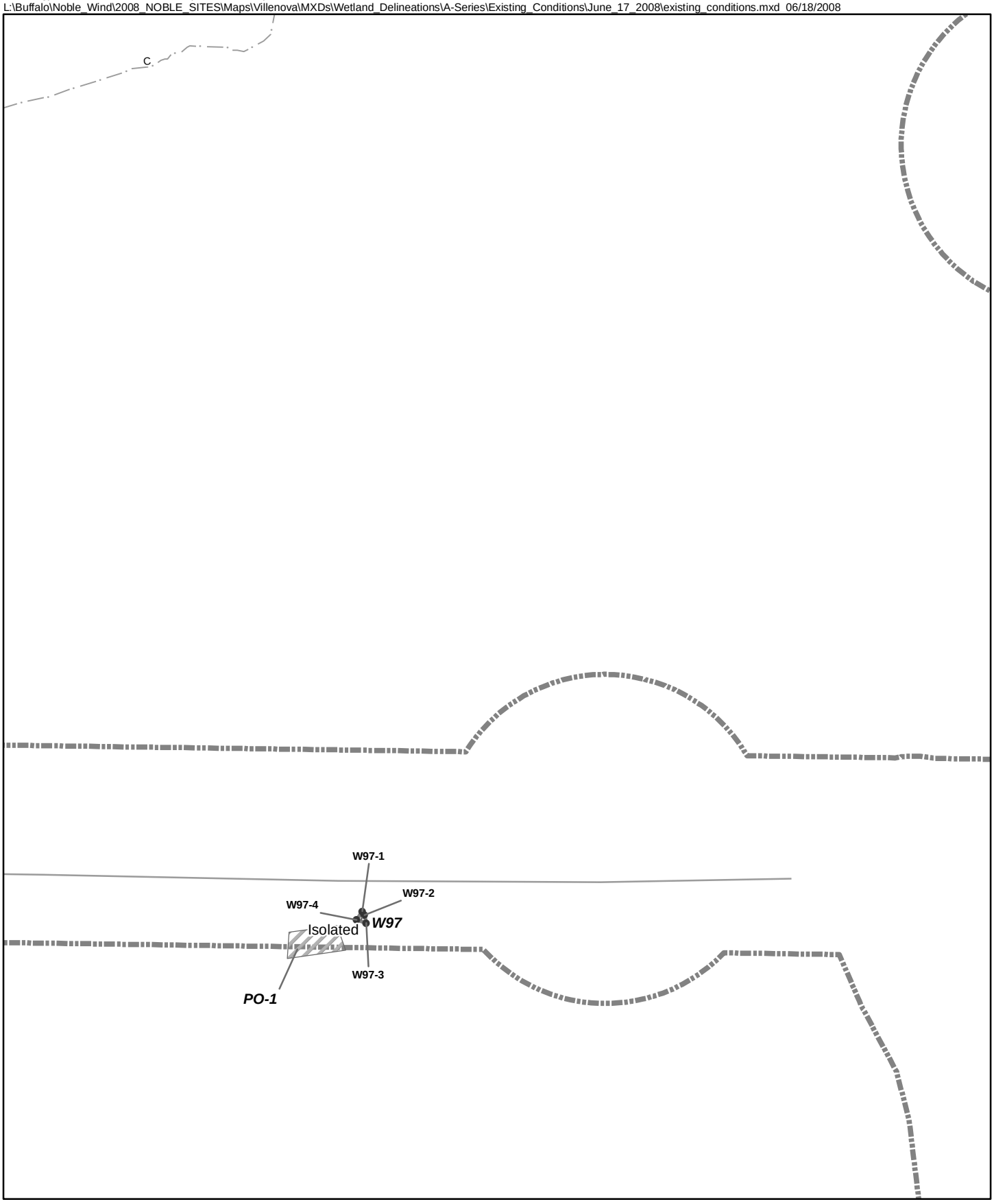

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame B-2
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



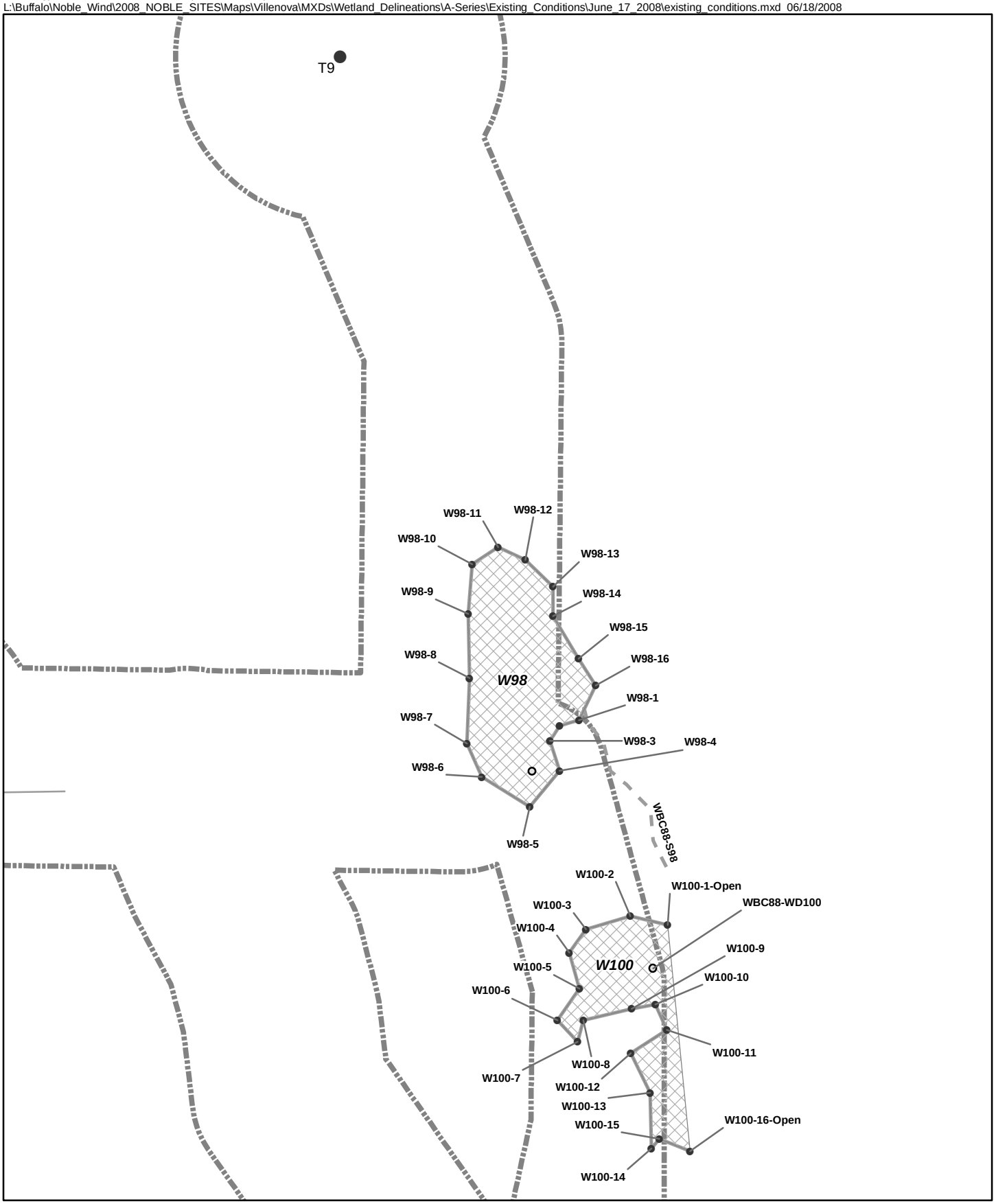

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame B-3
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



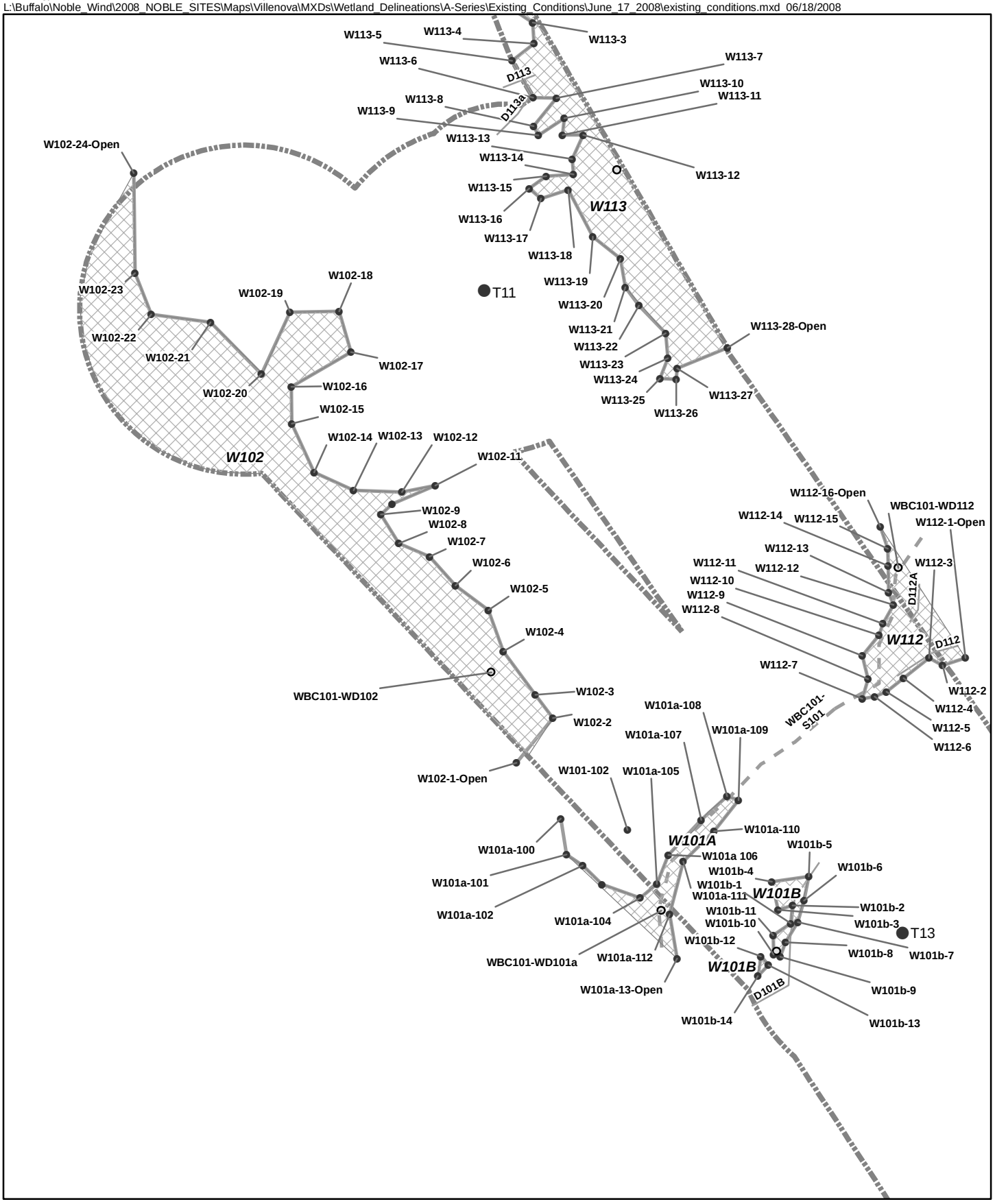

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame B-4
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



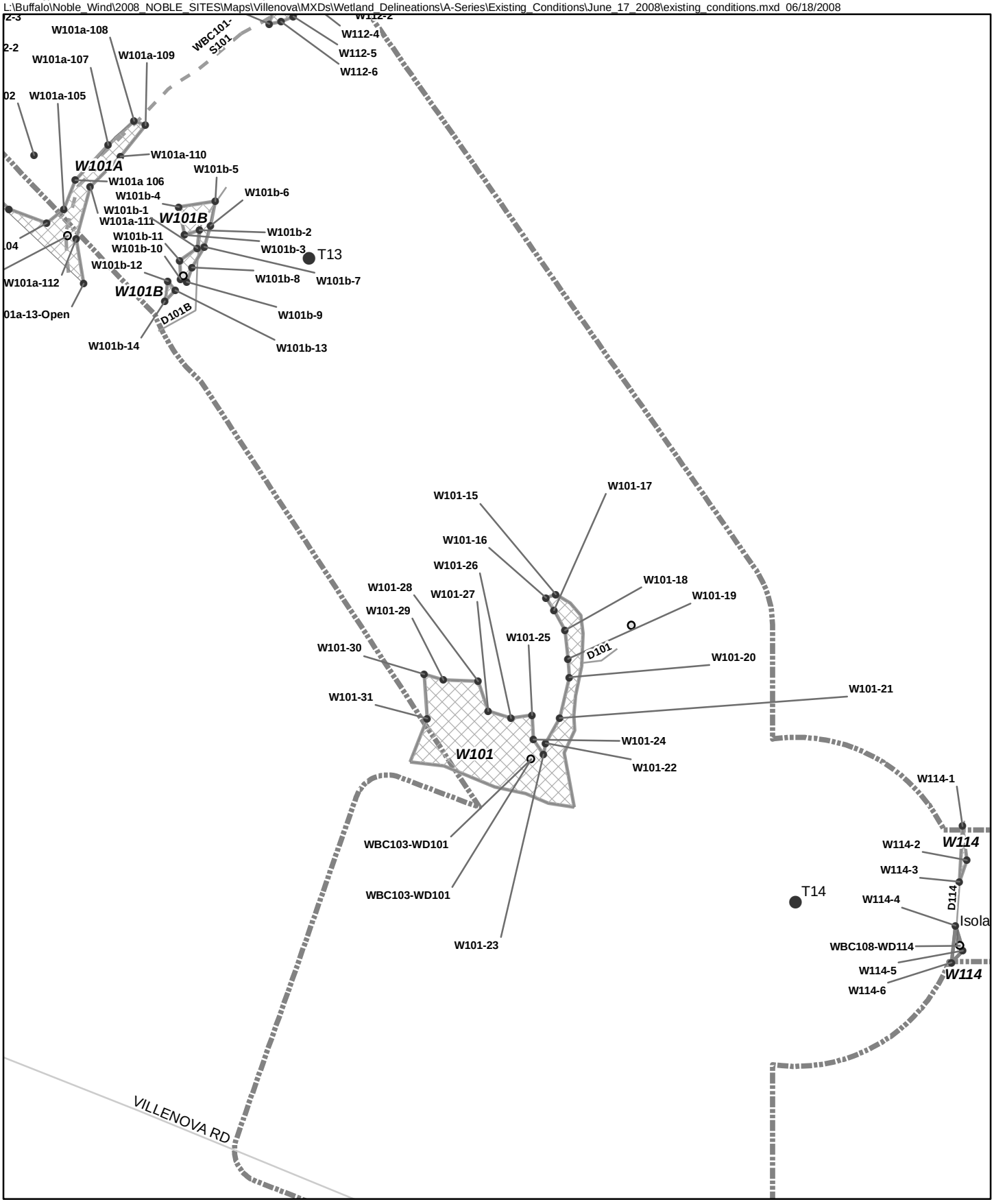

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame B-5
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

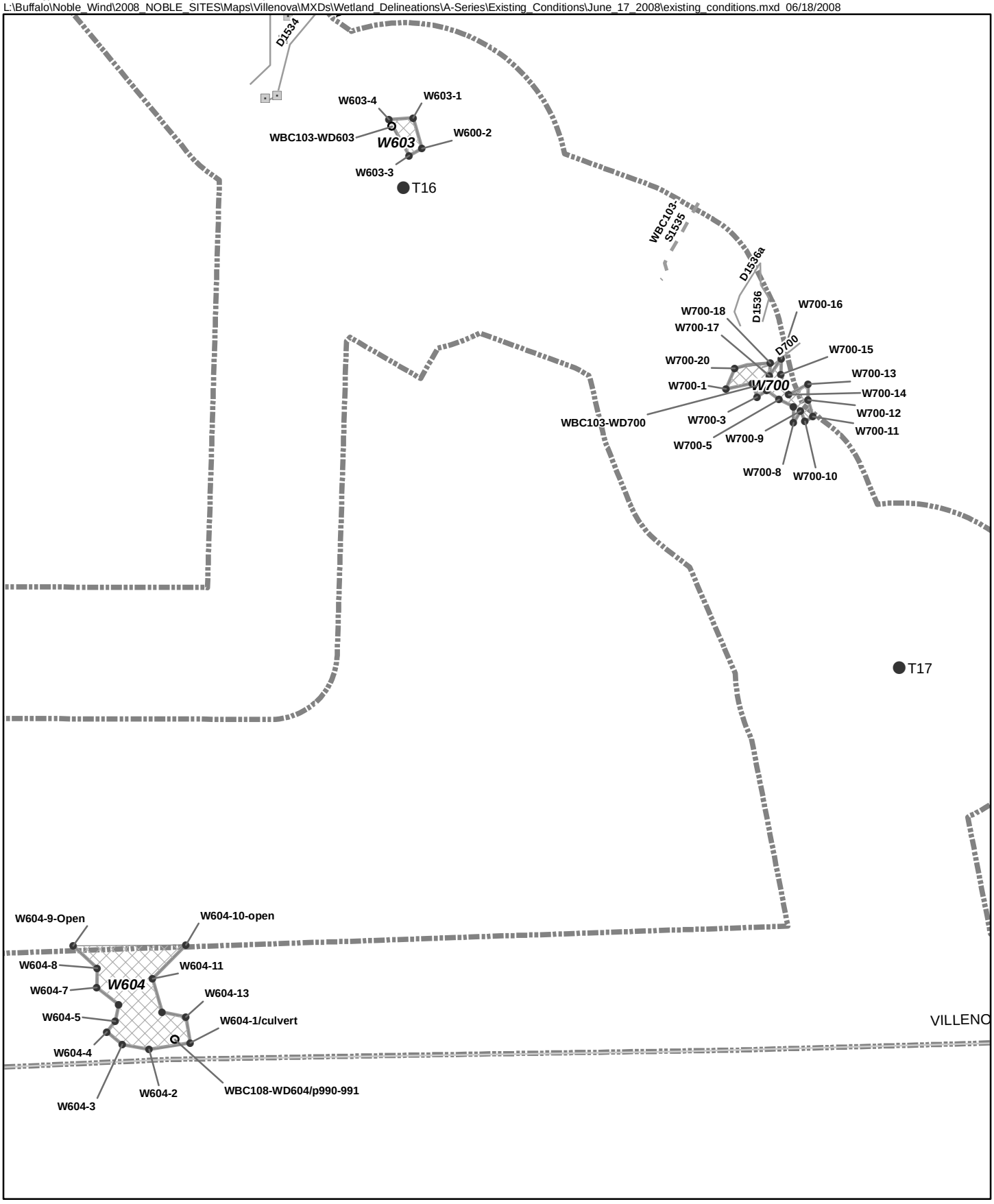
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame B-6
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



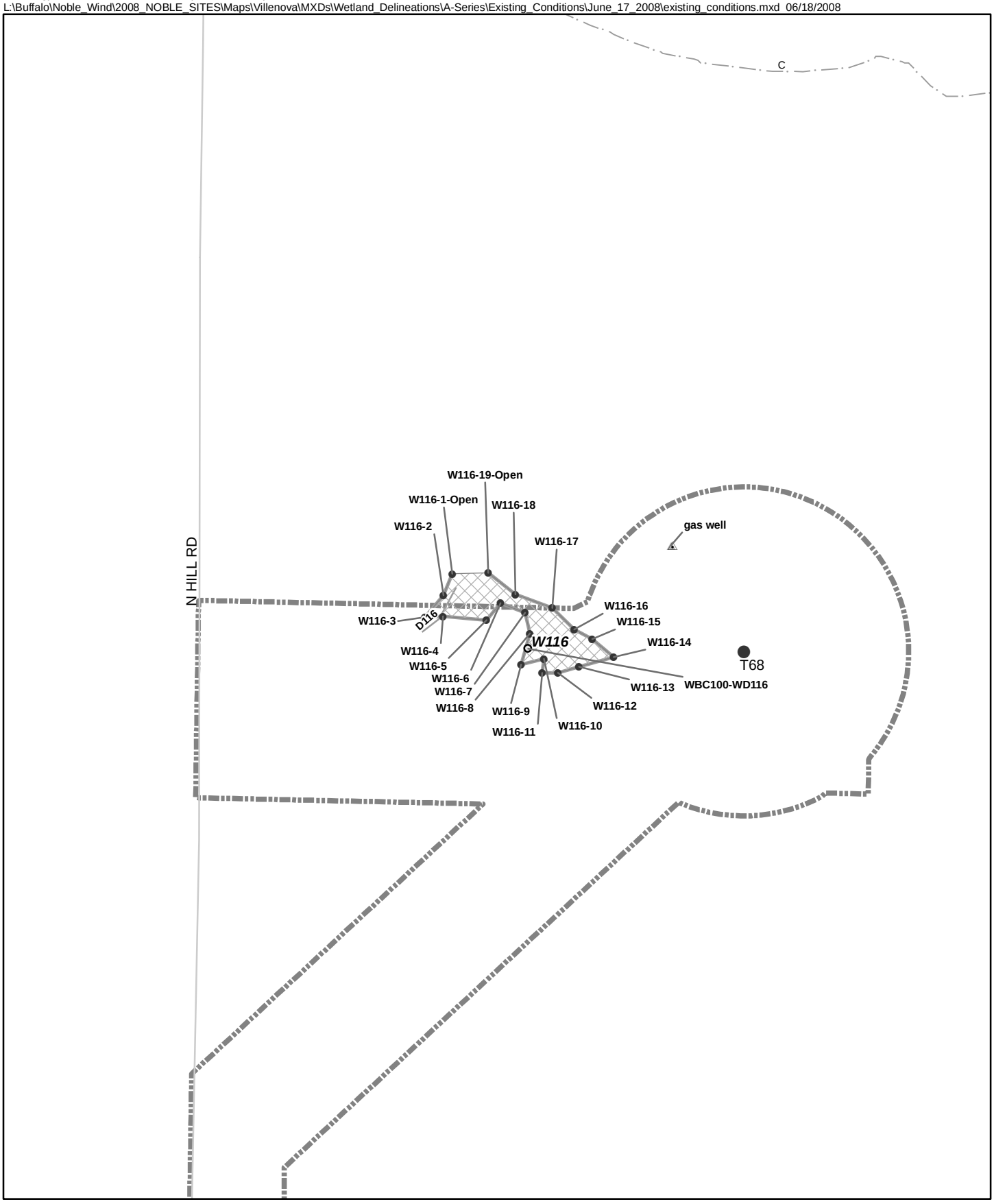

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame B-7
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

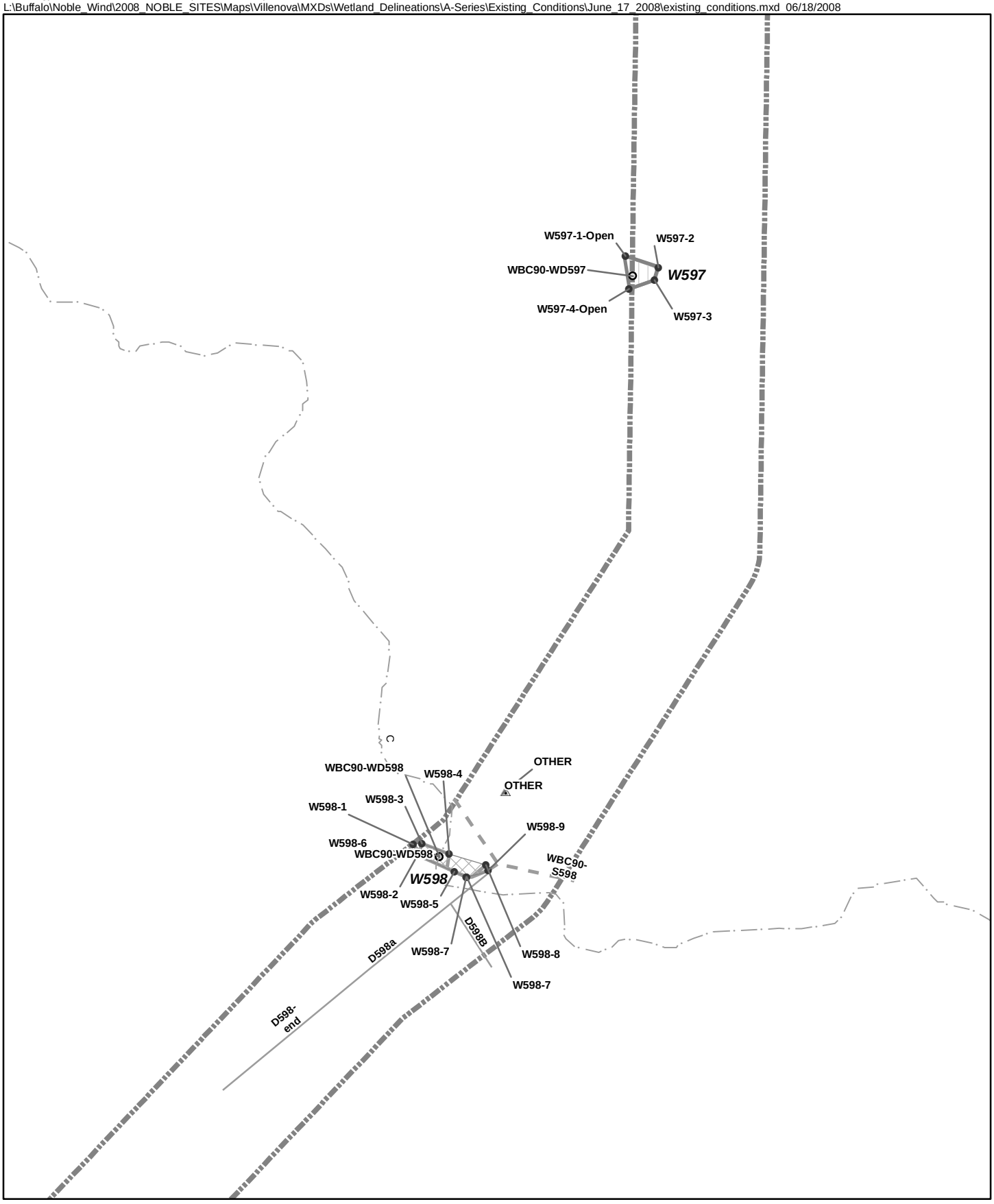
Frame B-8
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Frame B-9
Ball Hill Windpark
Field Delineated Wetlands



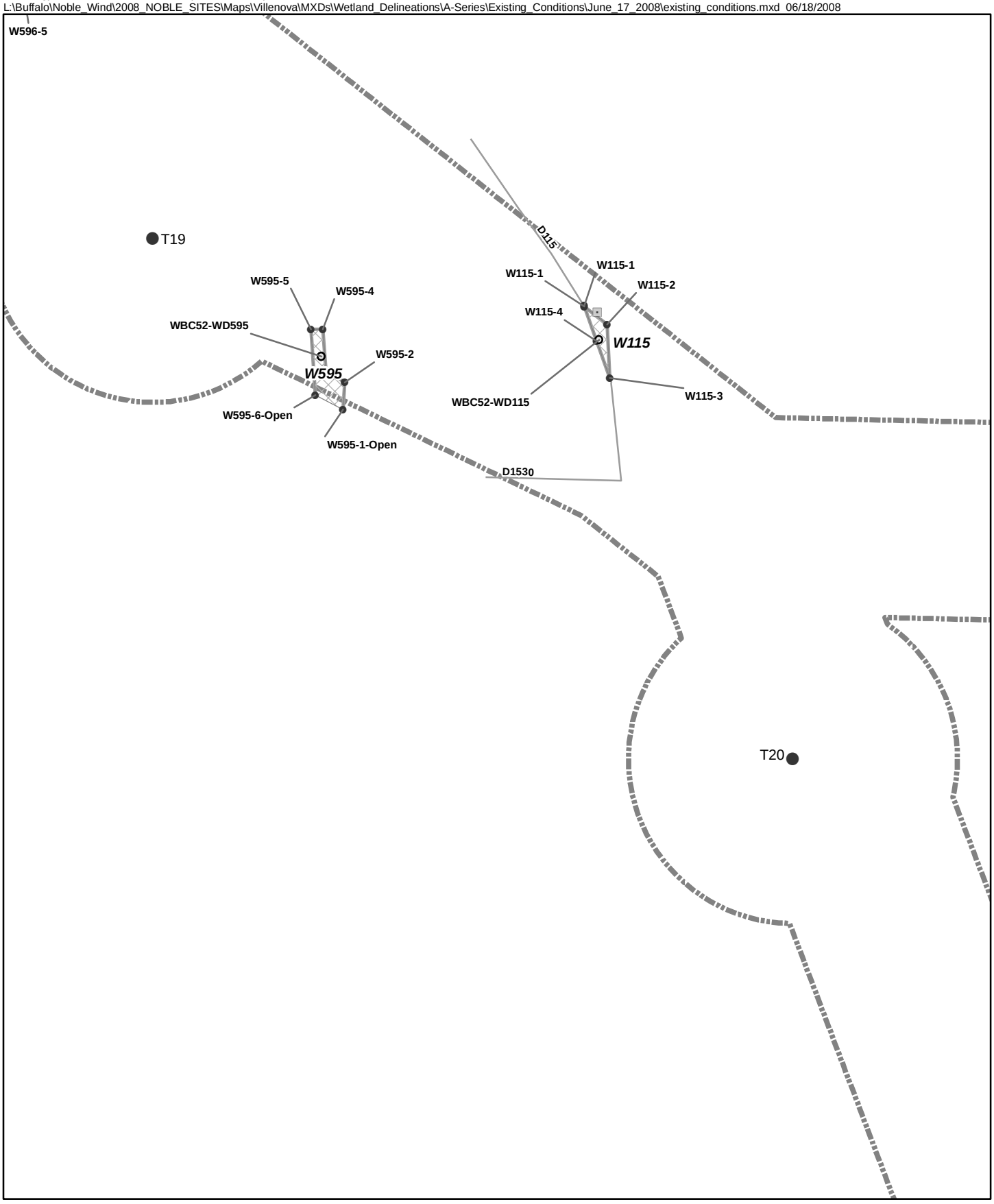

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame B-10
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

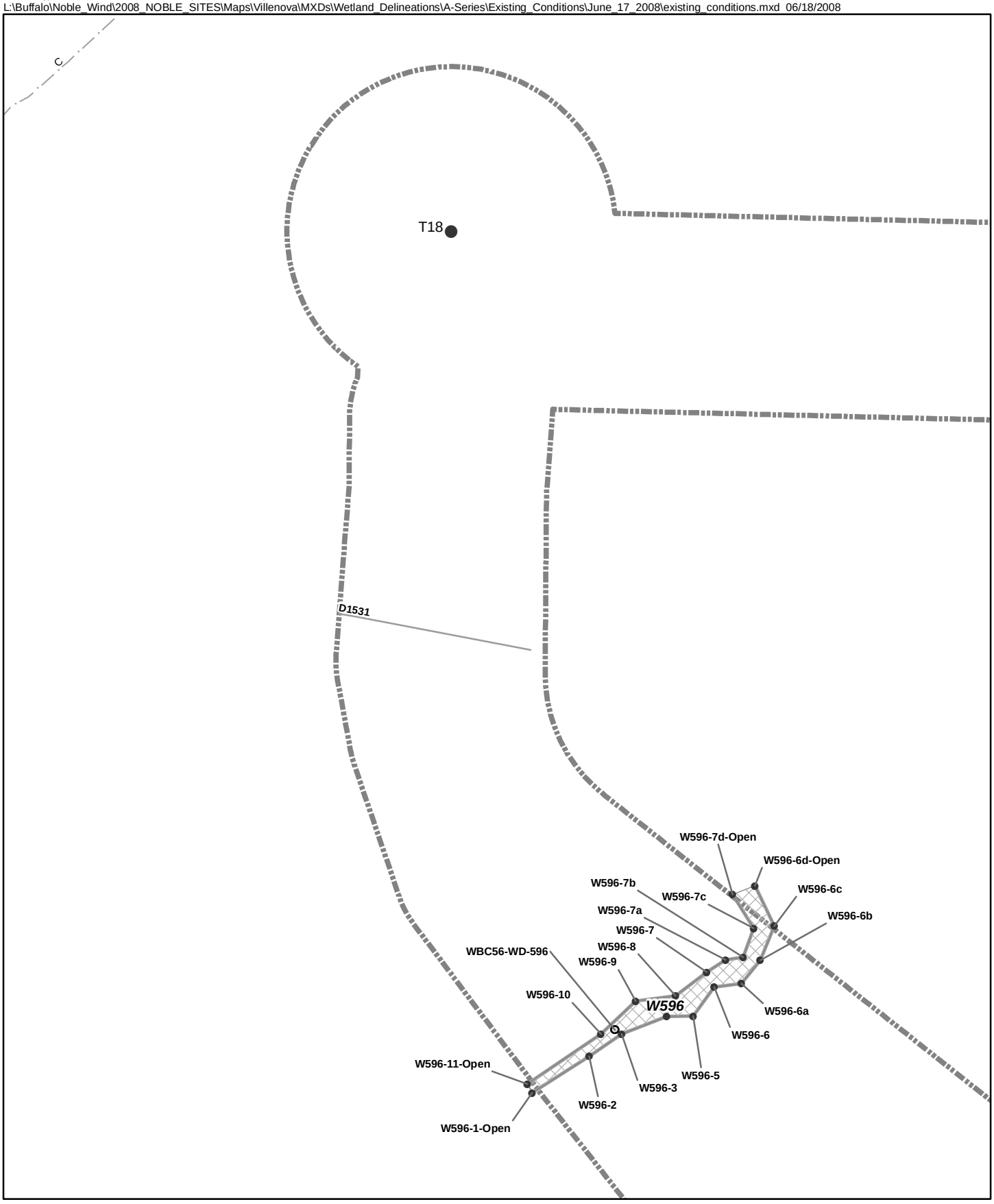
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame B-11
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

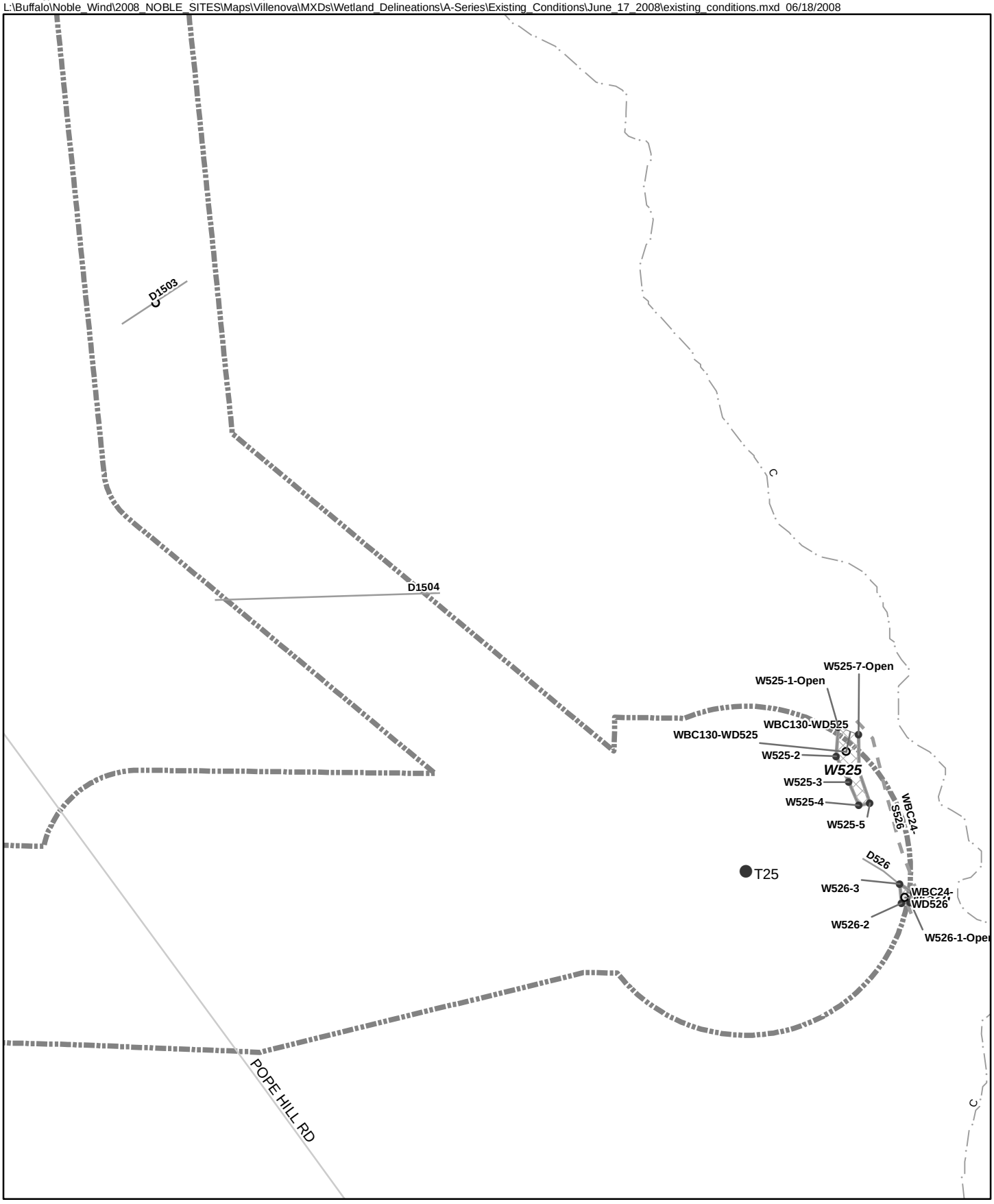
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame B-12
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet



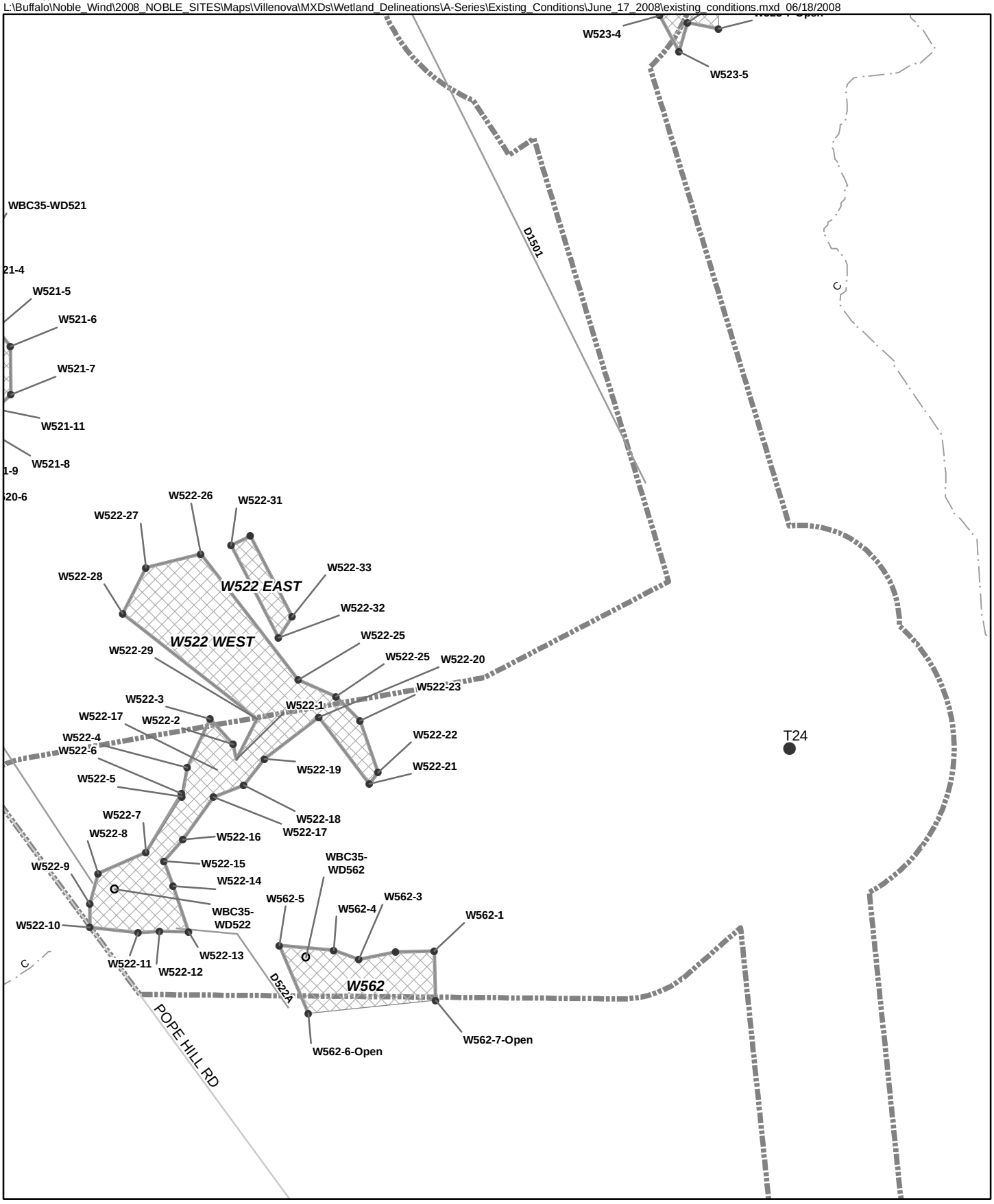

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame C-1
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



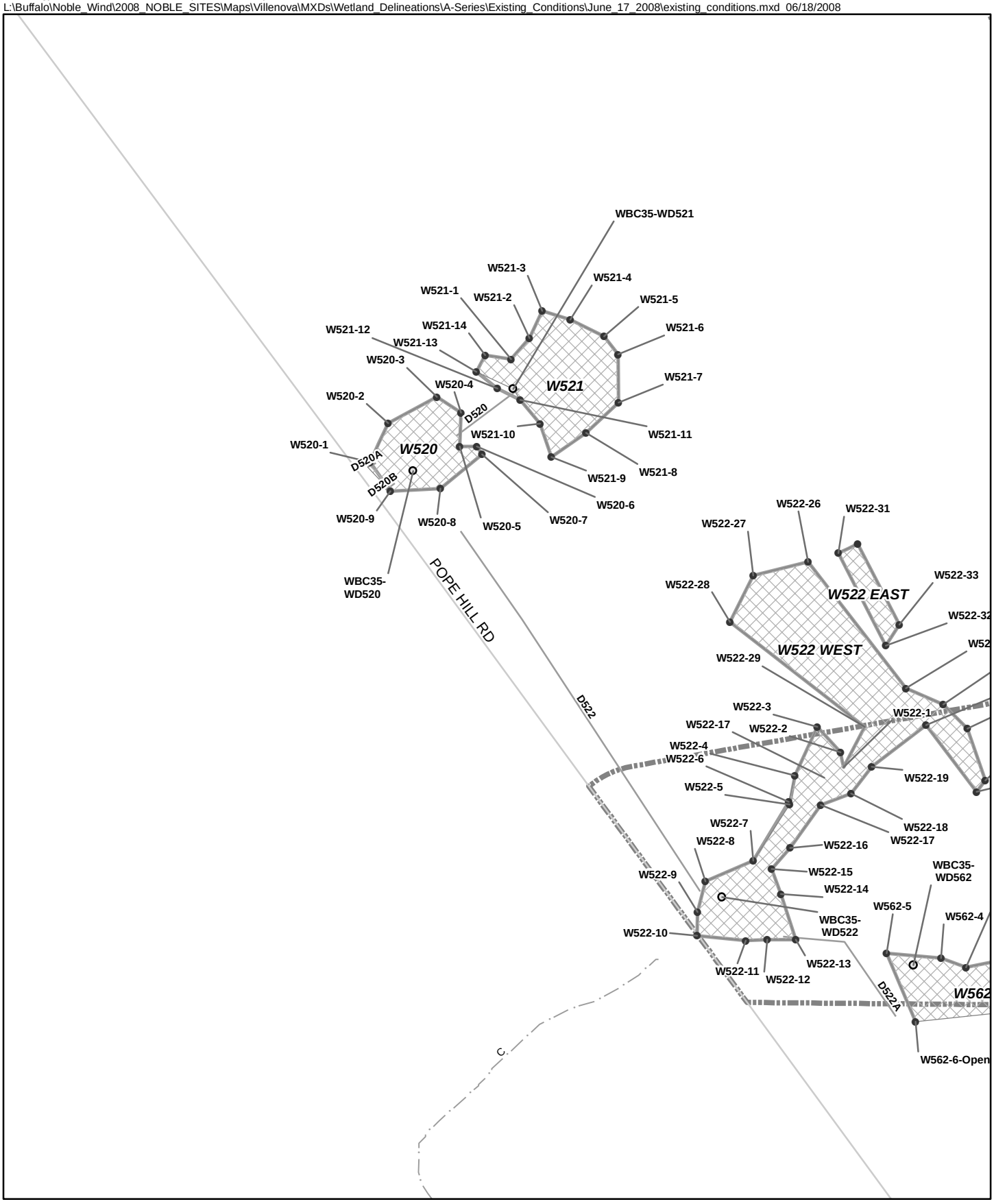

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-2
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

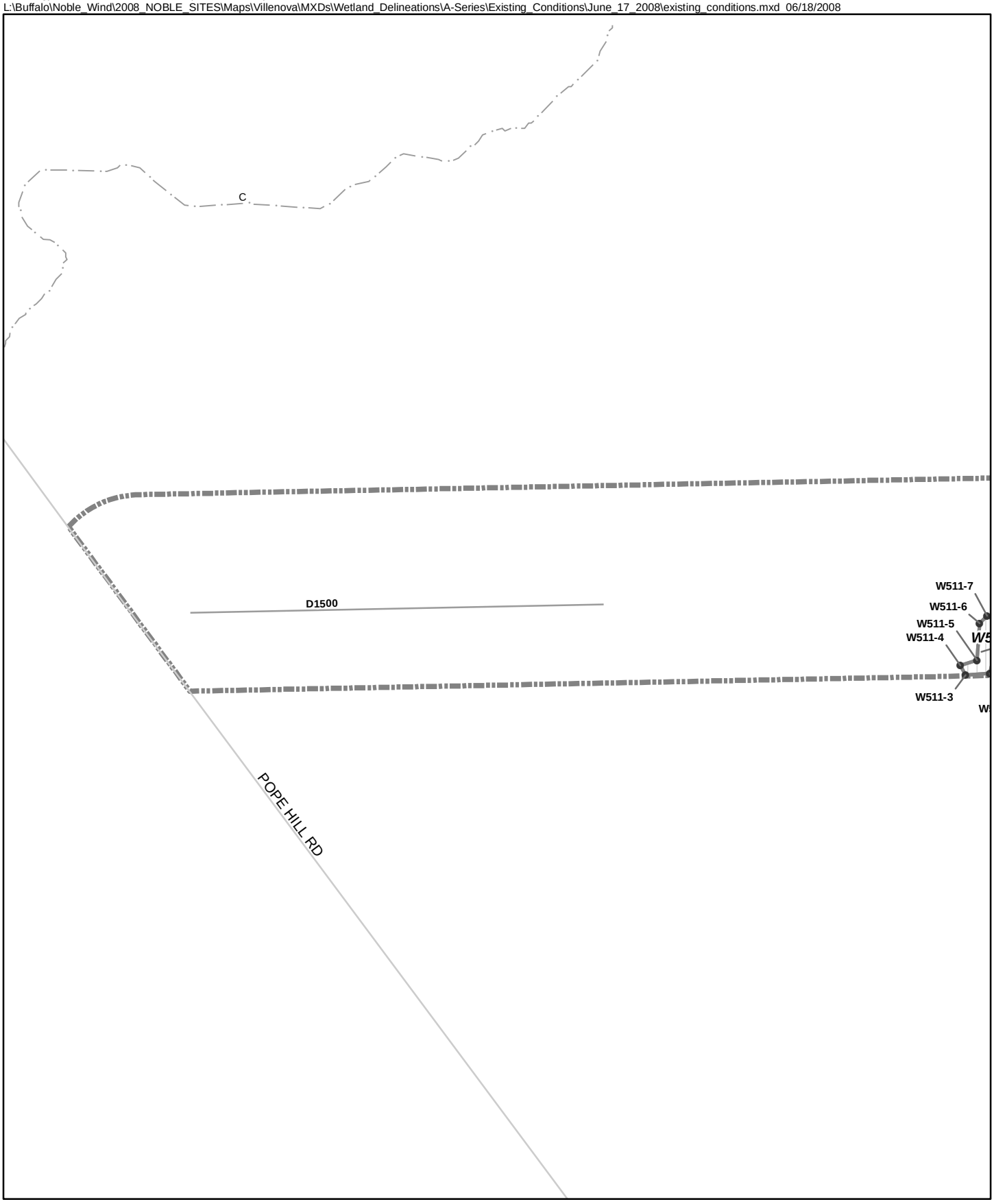
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-3
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

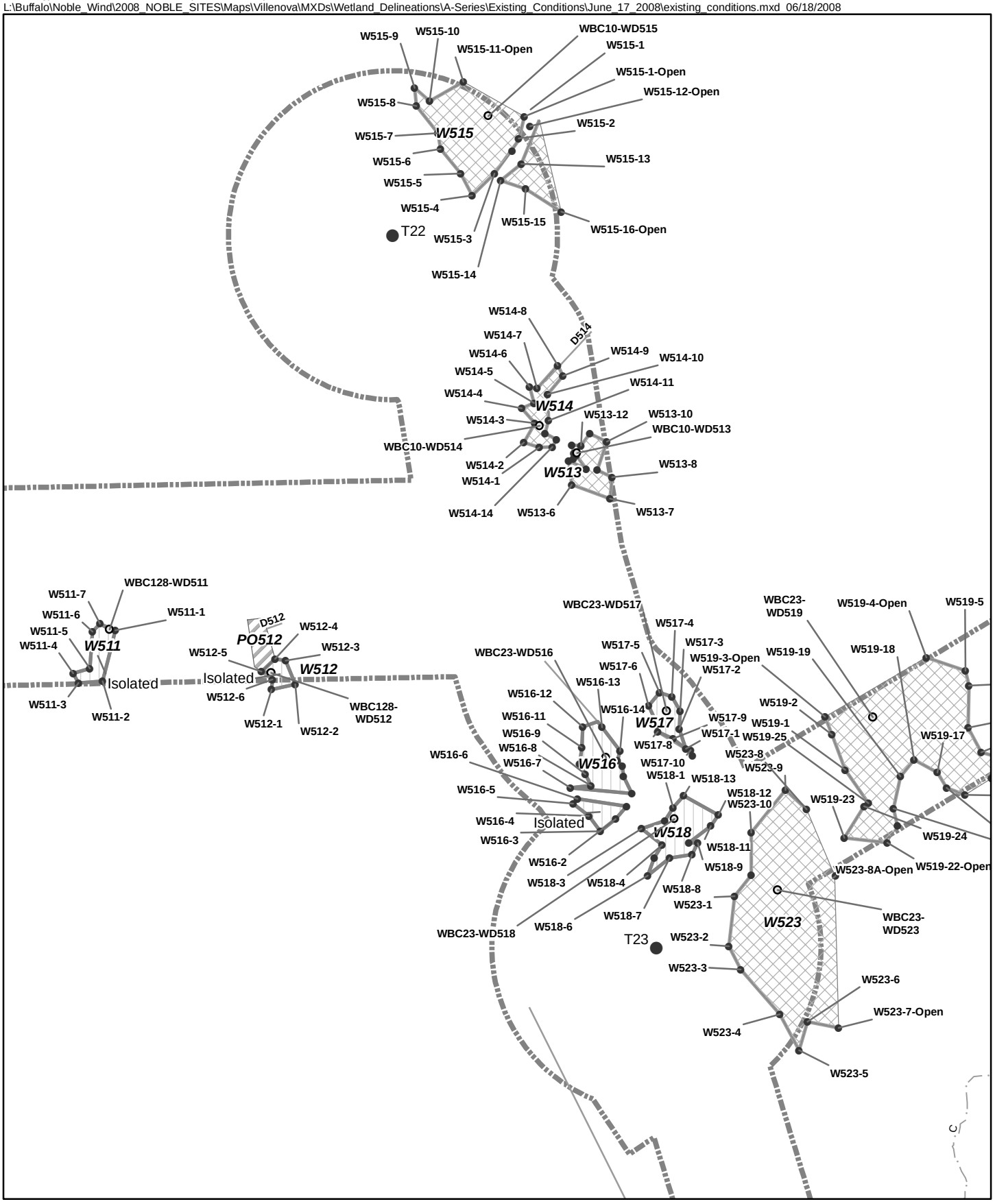
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-4
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



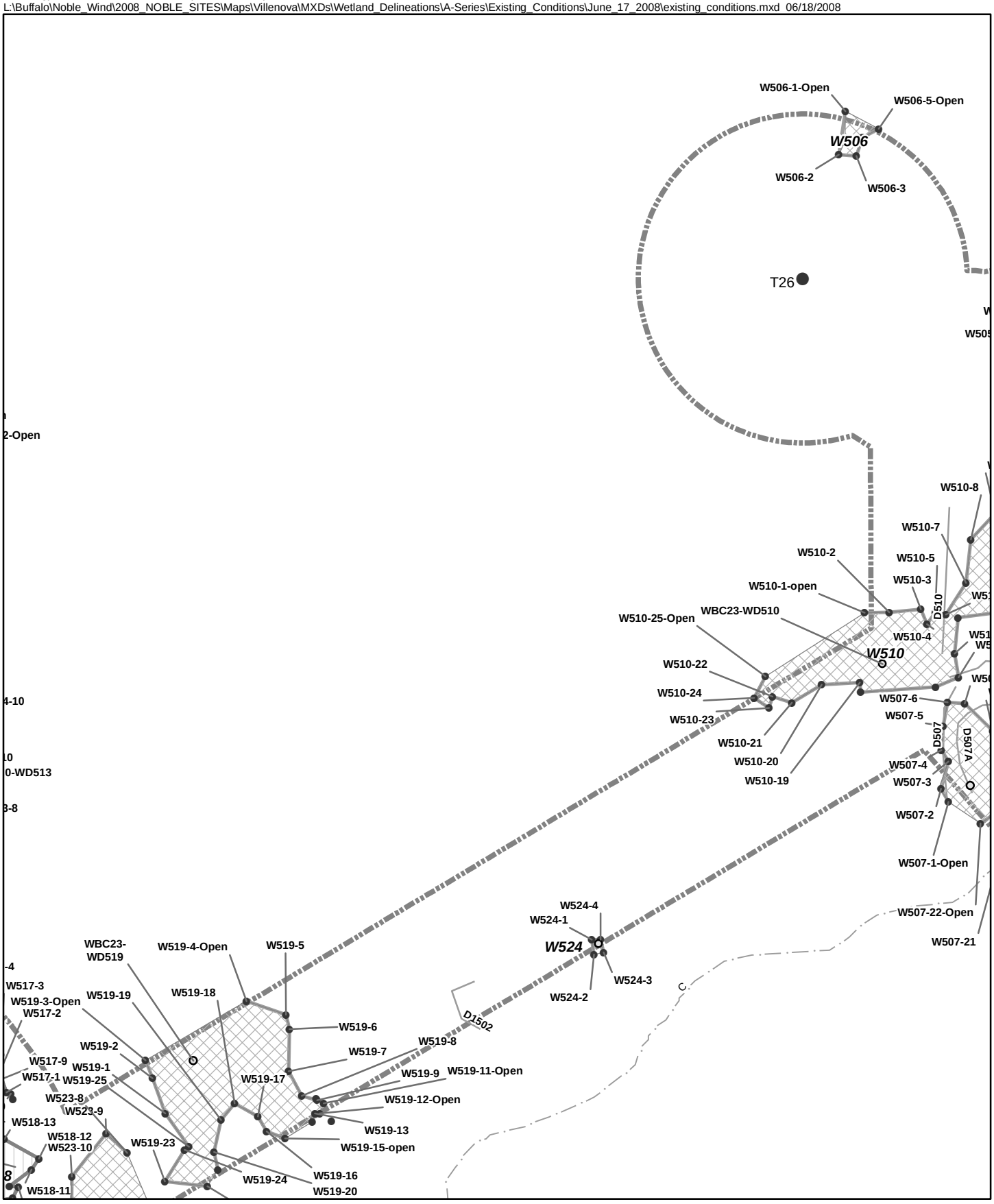

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-5
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



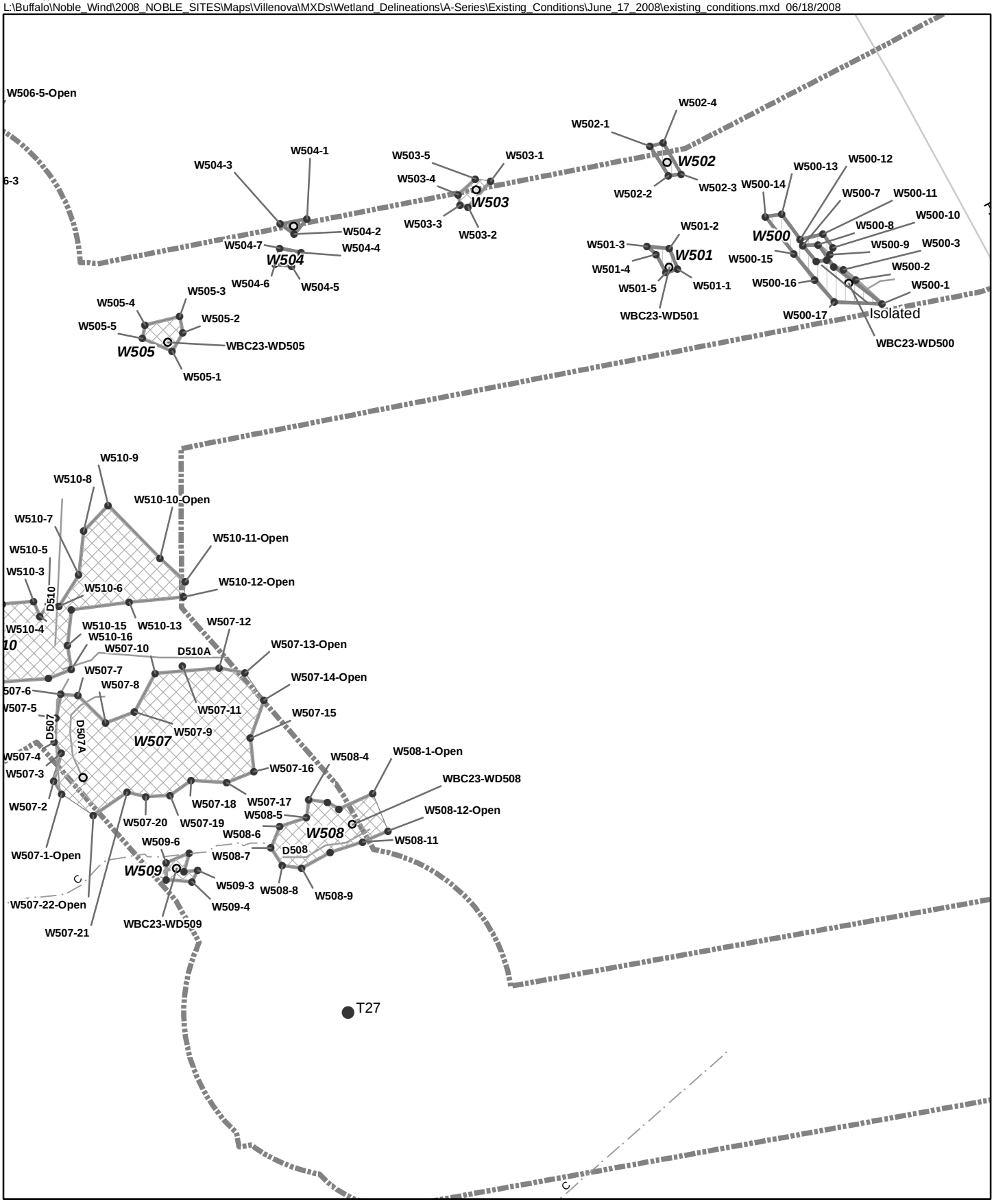

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame C-6
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



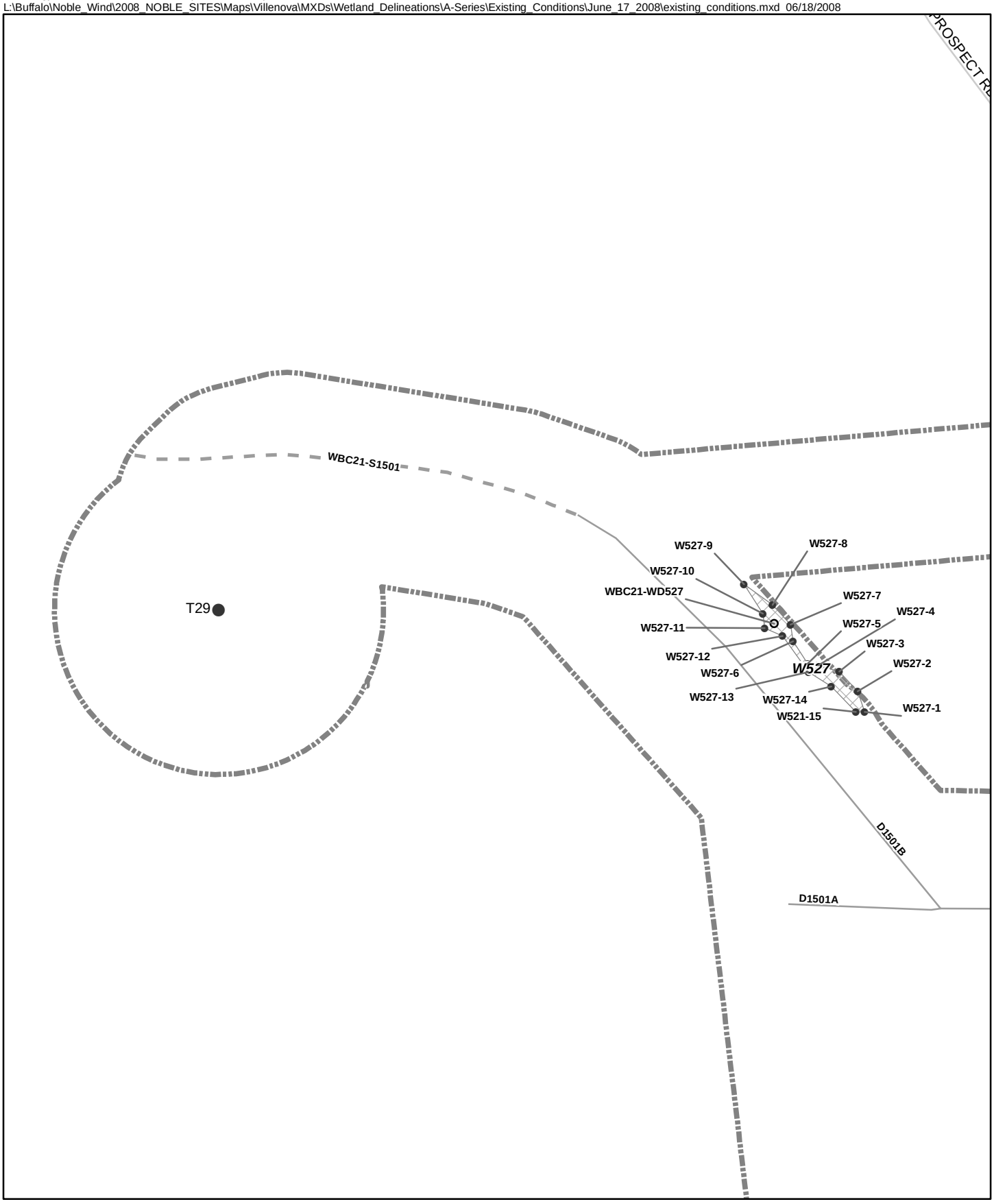

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-7
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



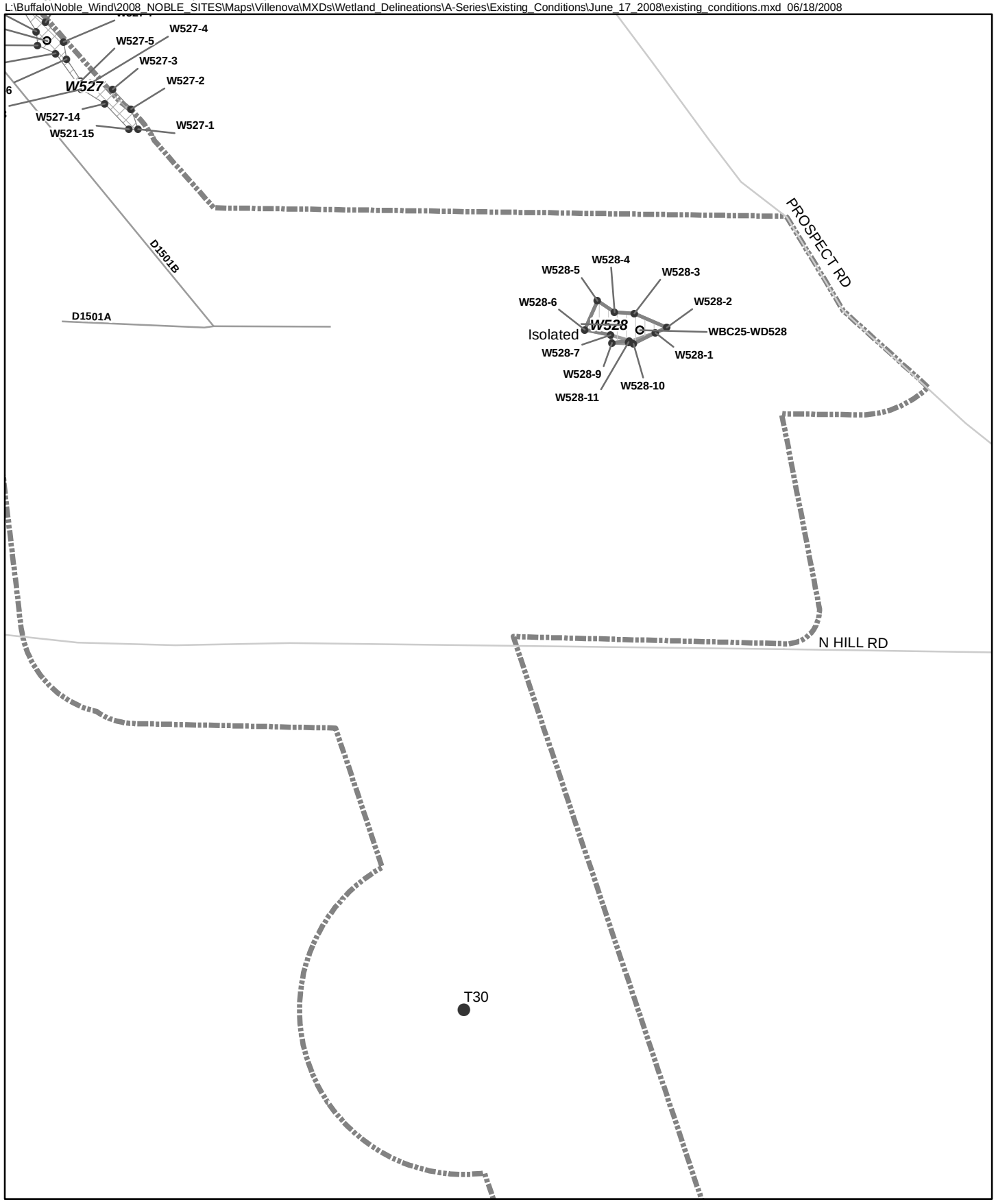

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame C-8
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

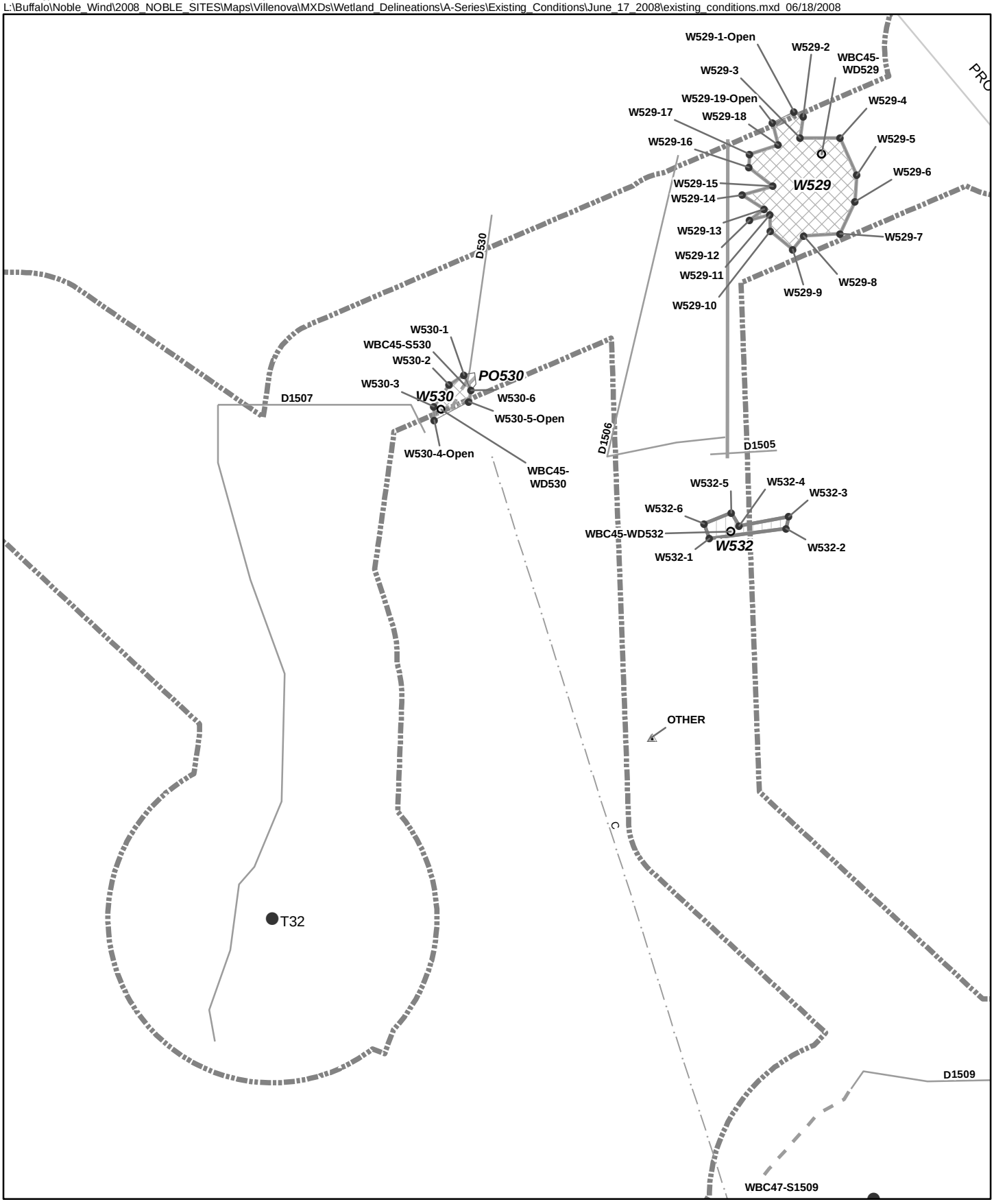
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-9
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

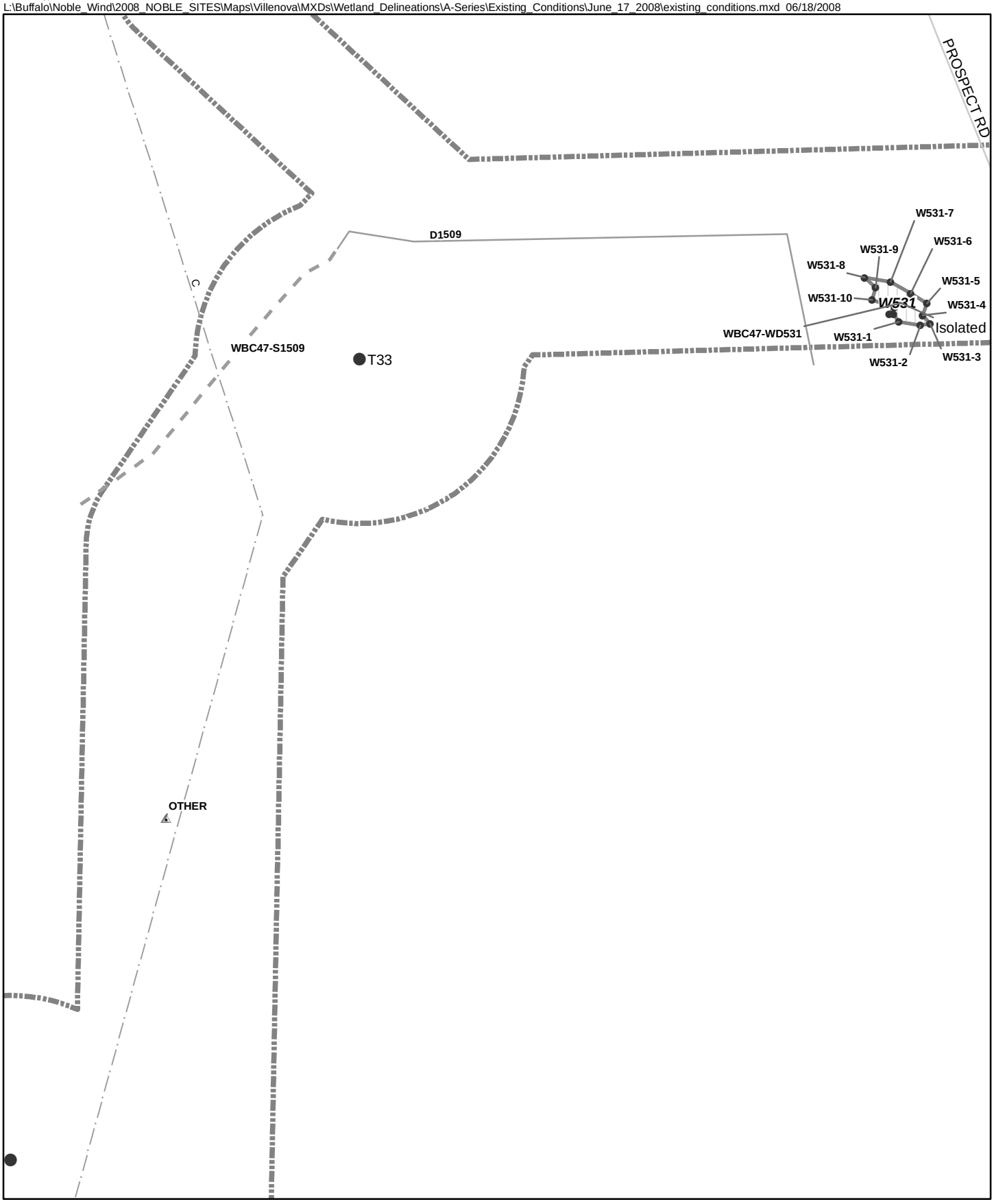
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-10
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



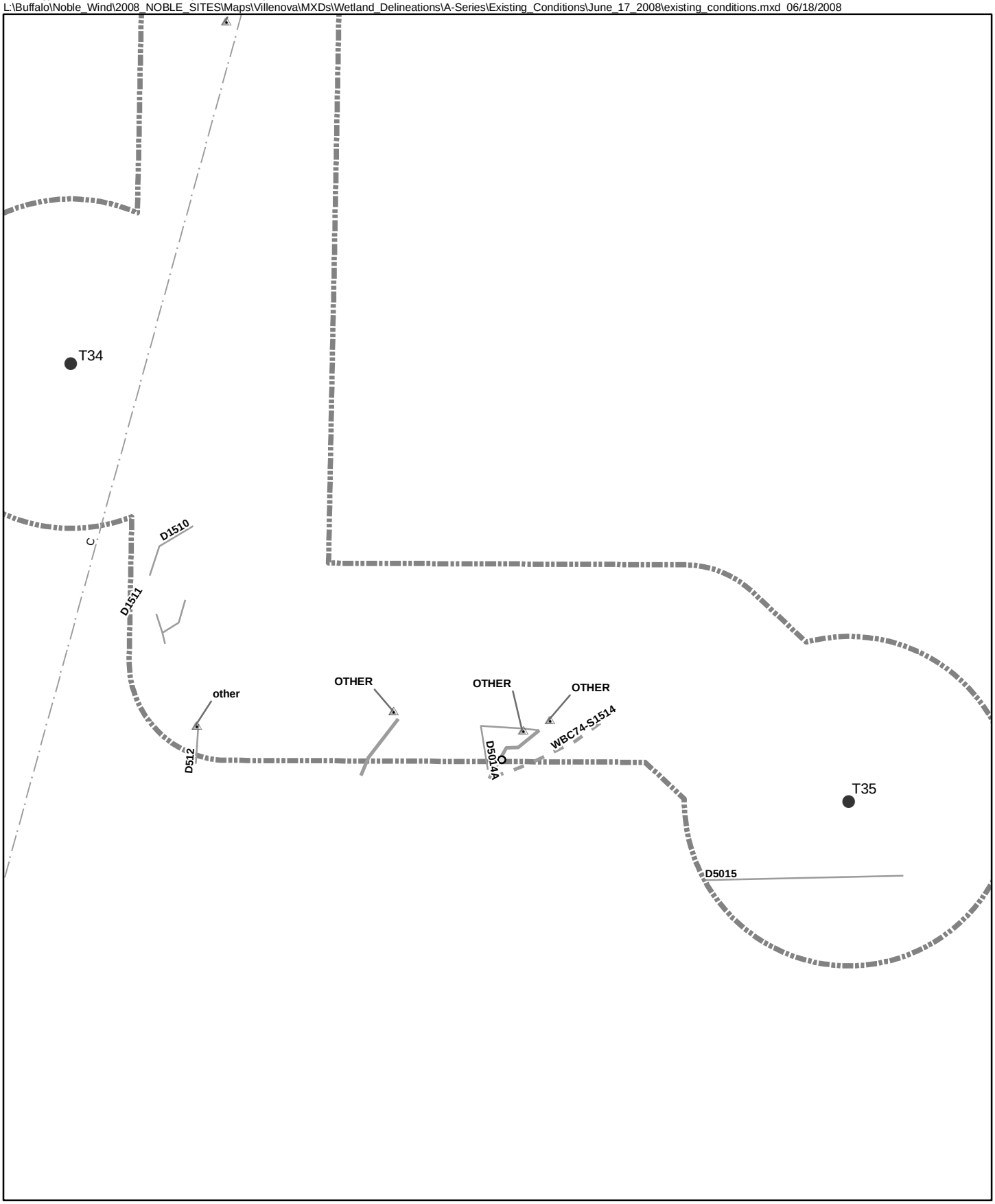

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame C-11
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

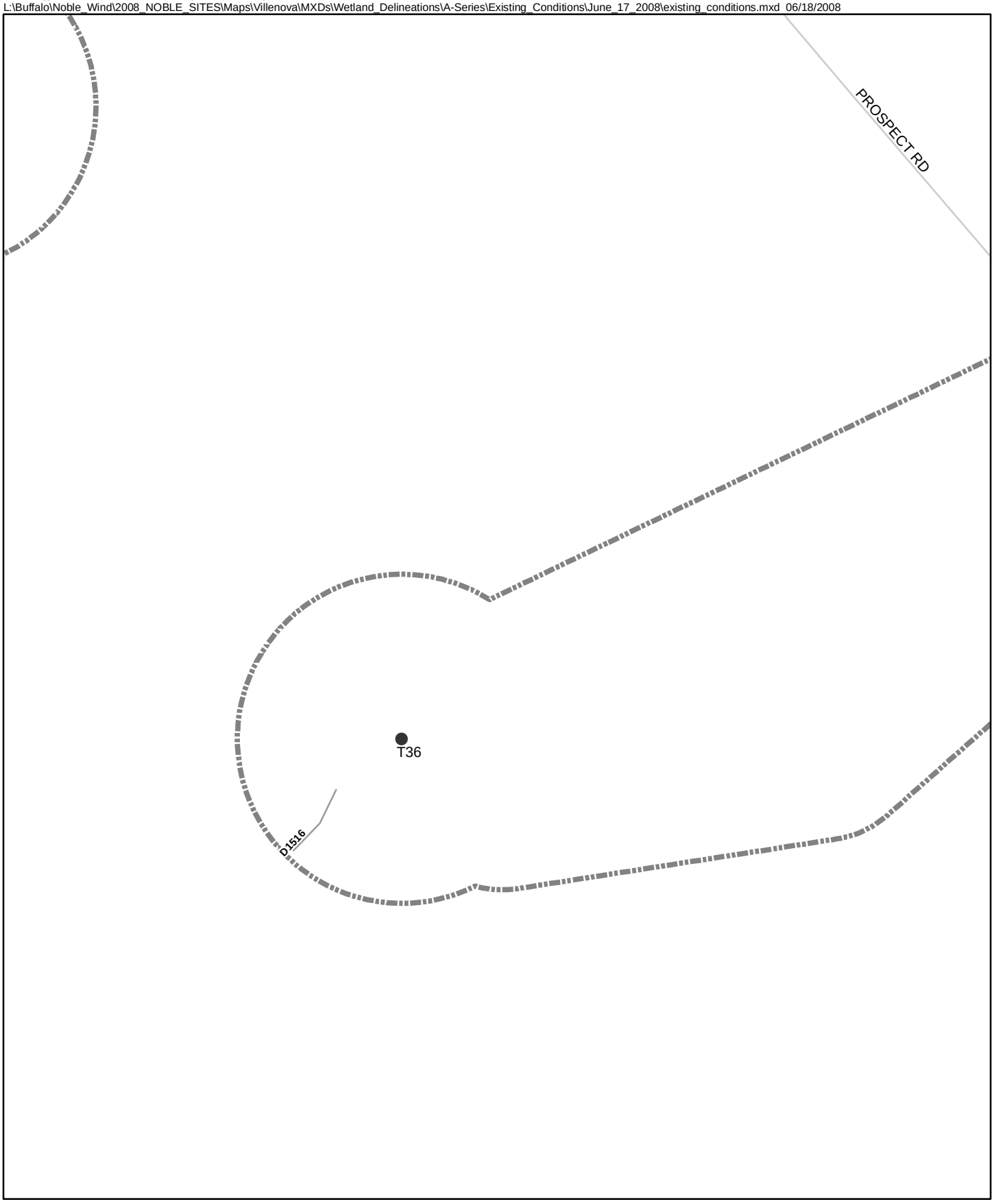
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame C-12
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



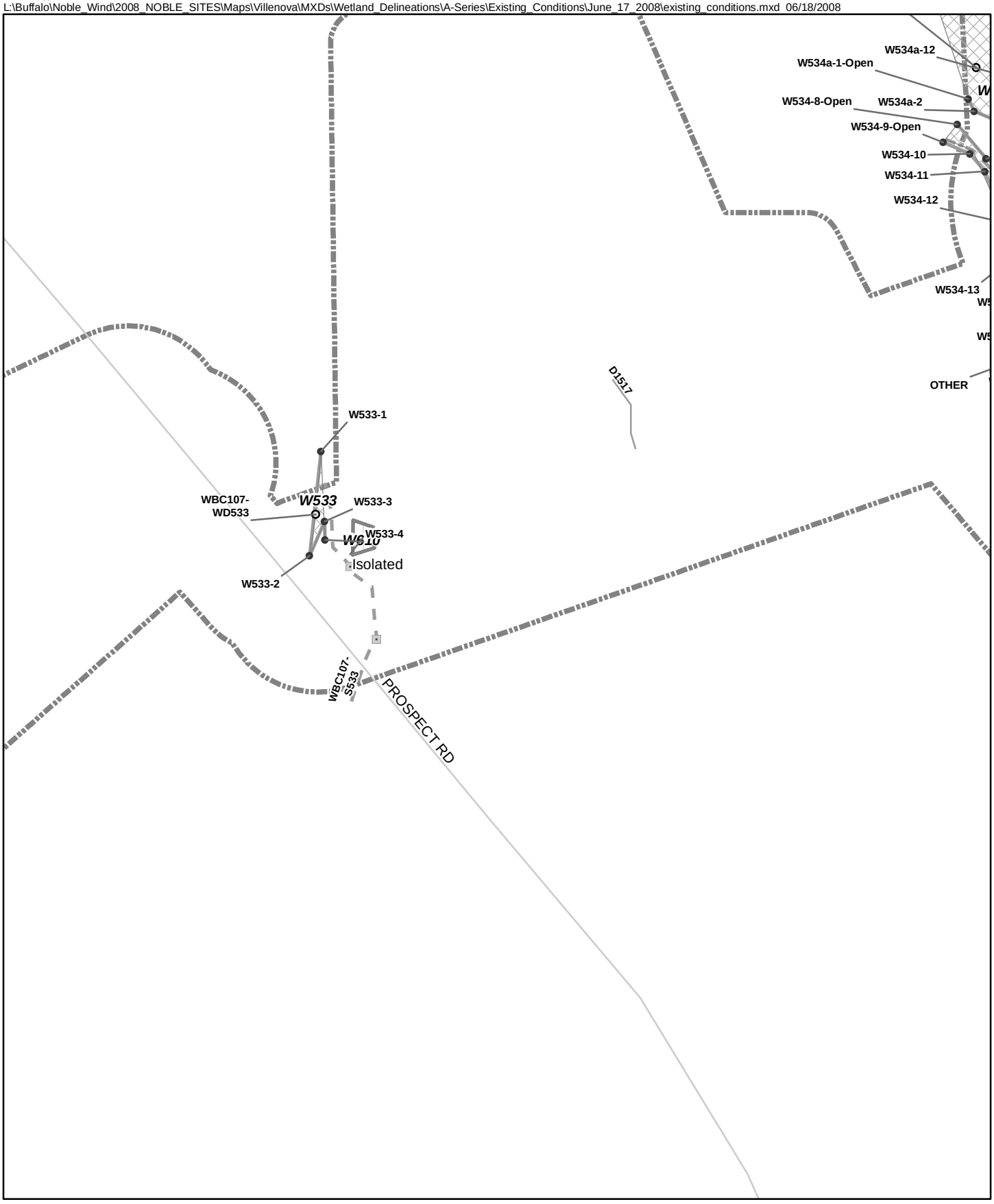

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame C-13
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



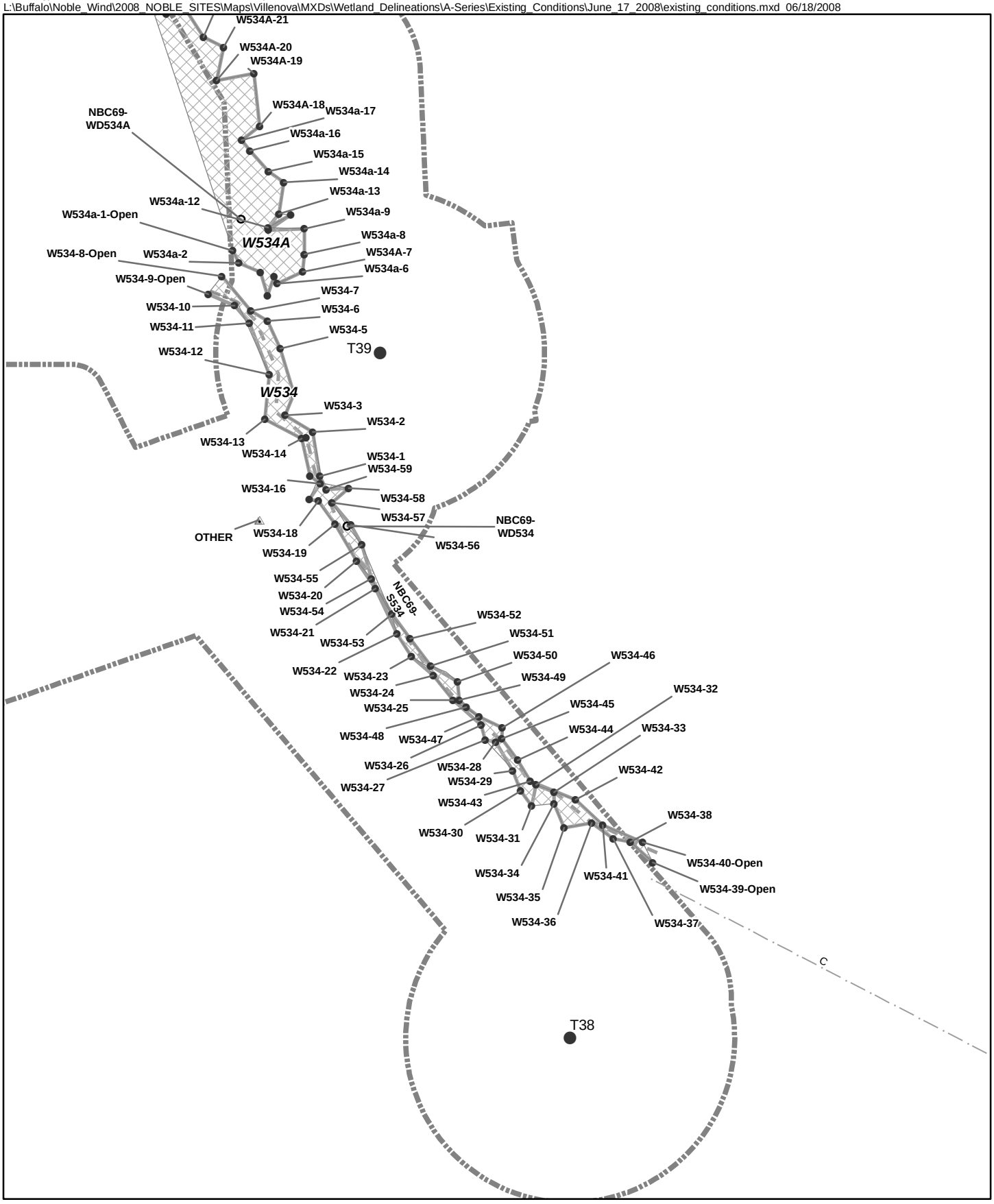

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-1
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

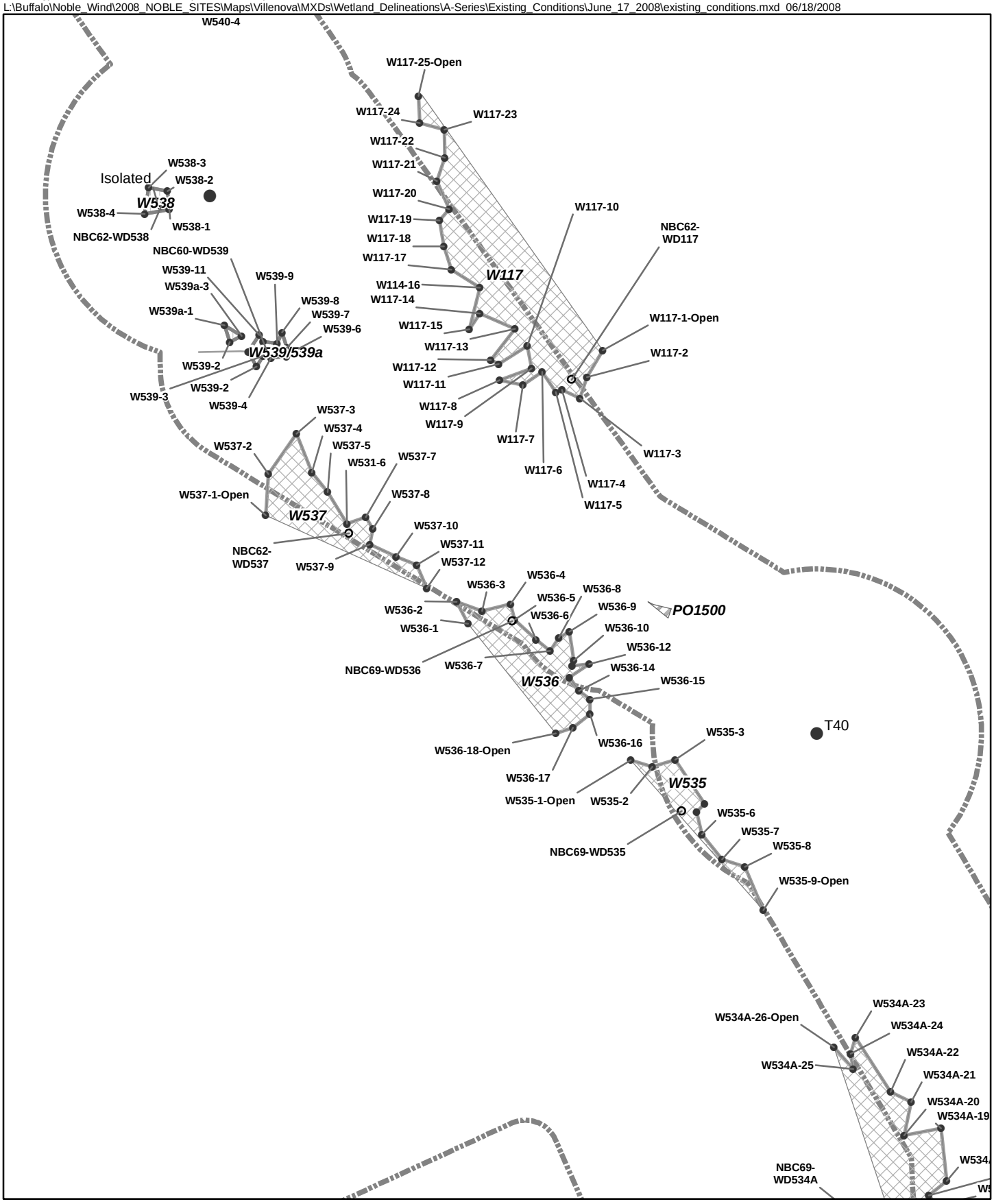
NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-2
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet

' Ecology & Environment, Inc. GIS Department Project #002270.NP32.02
L:\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\Wetland_Delineations\A-Series\Existing_Conditions\June_17_2008\existing_conditions.mxd 06/18/2008

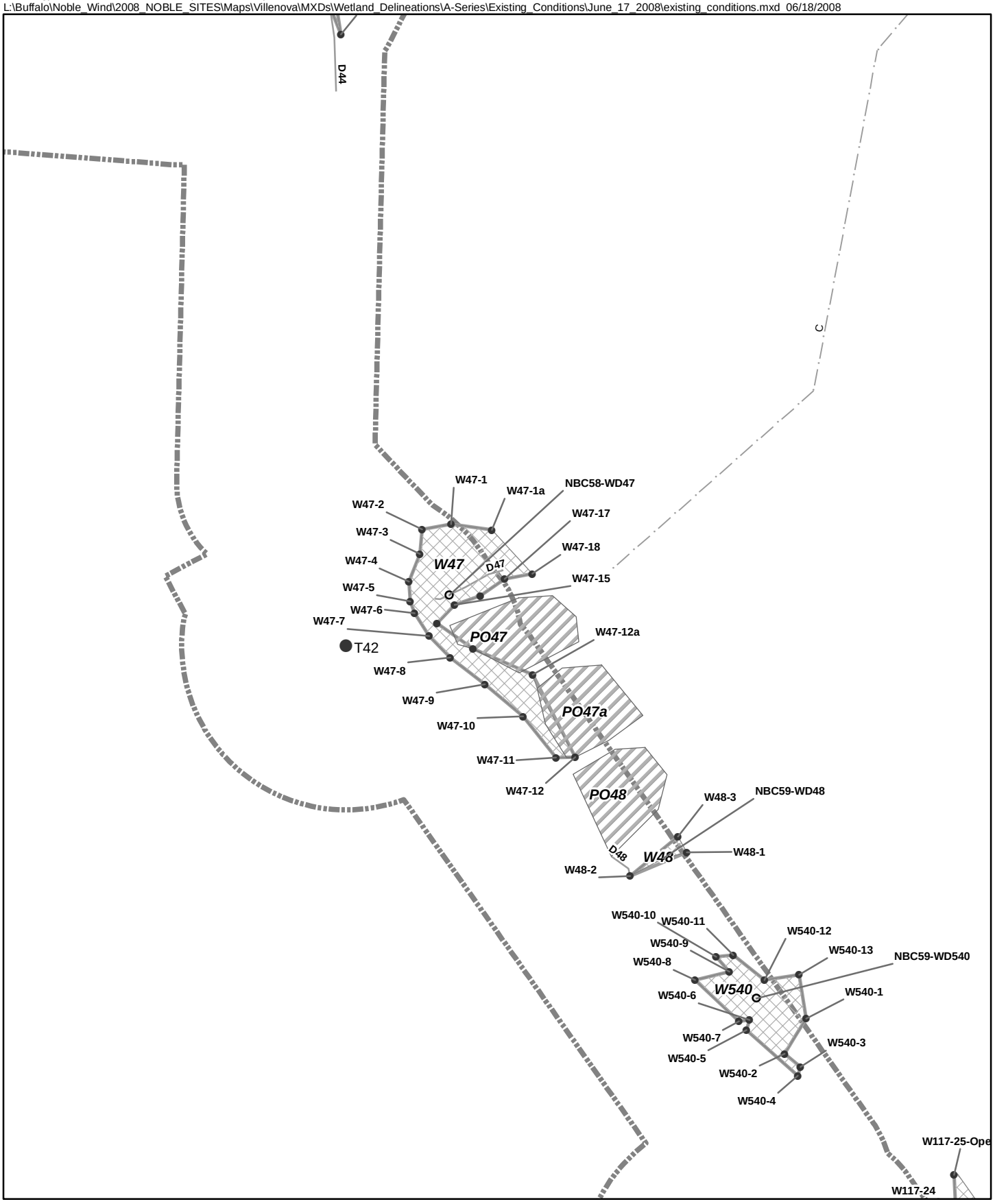



Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-3
Ball Hill Windpark
Field Delineated Wetlands




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

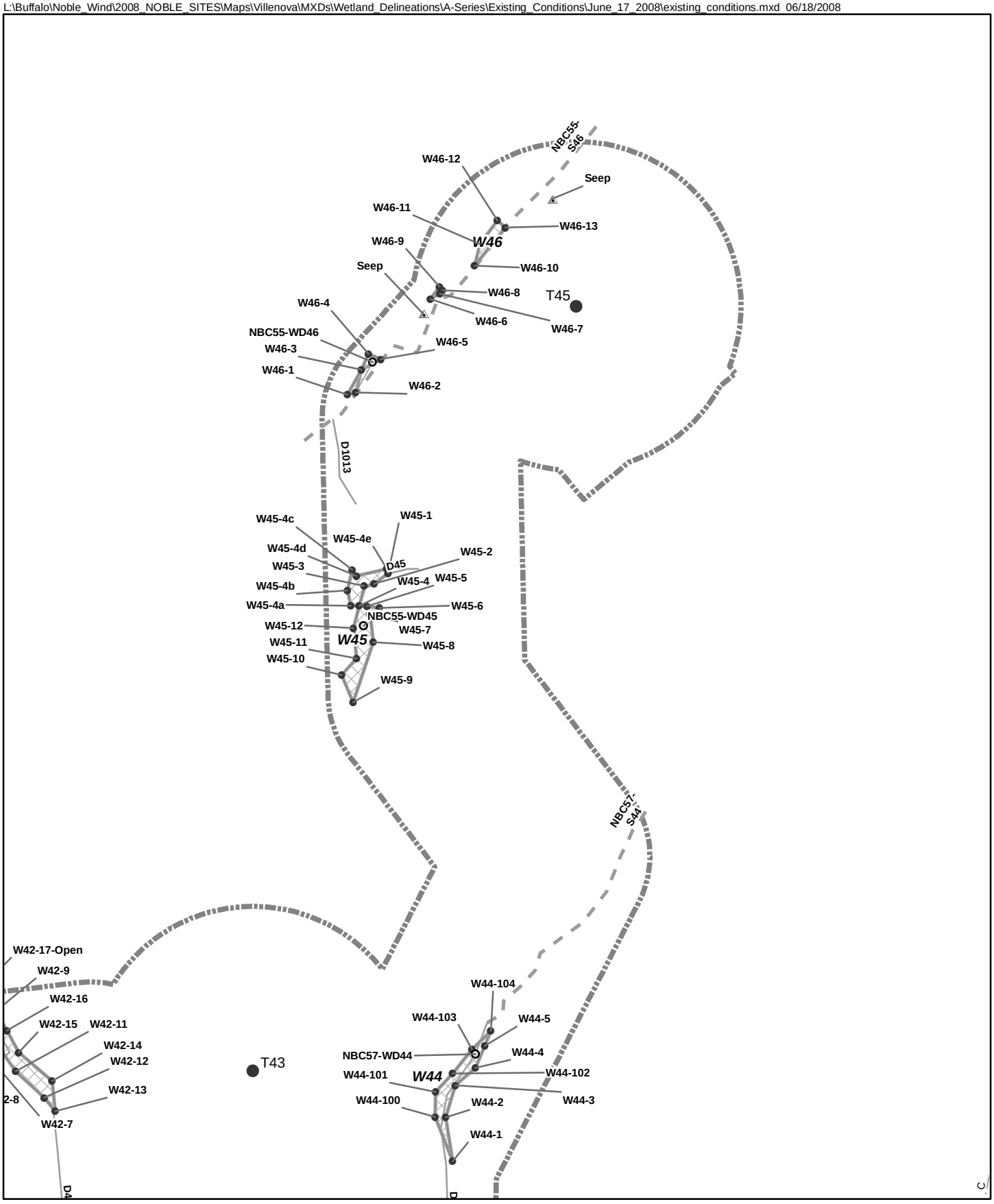
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-4
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet

' Ecology & Environment, Inc. GIS Department Project #002270.NP32.02
L:\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\Wetland_Delineations\A-Series\Existing_Conditions\June_17_2008\existing_conditions.mxd 06/18/2008



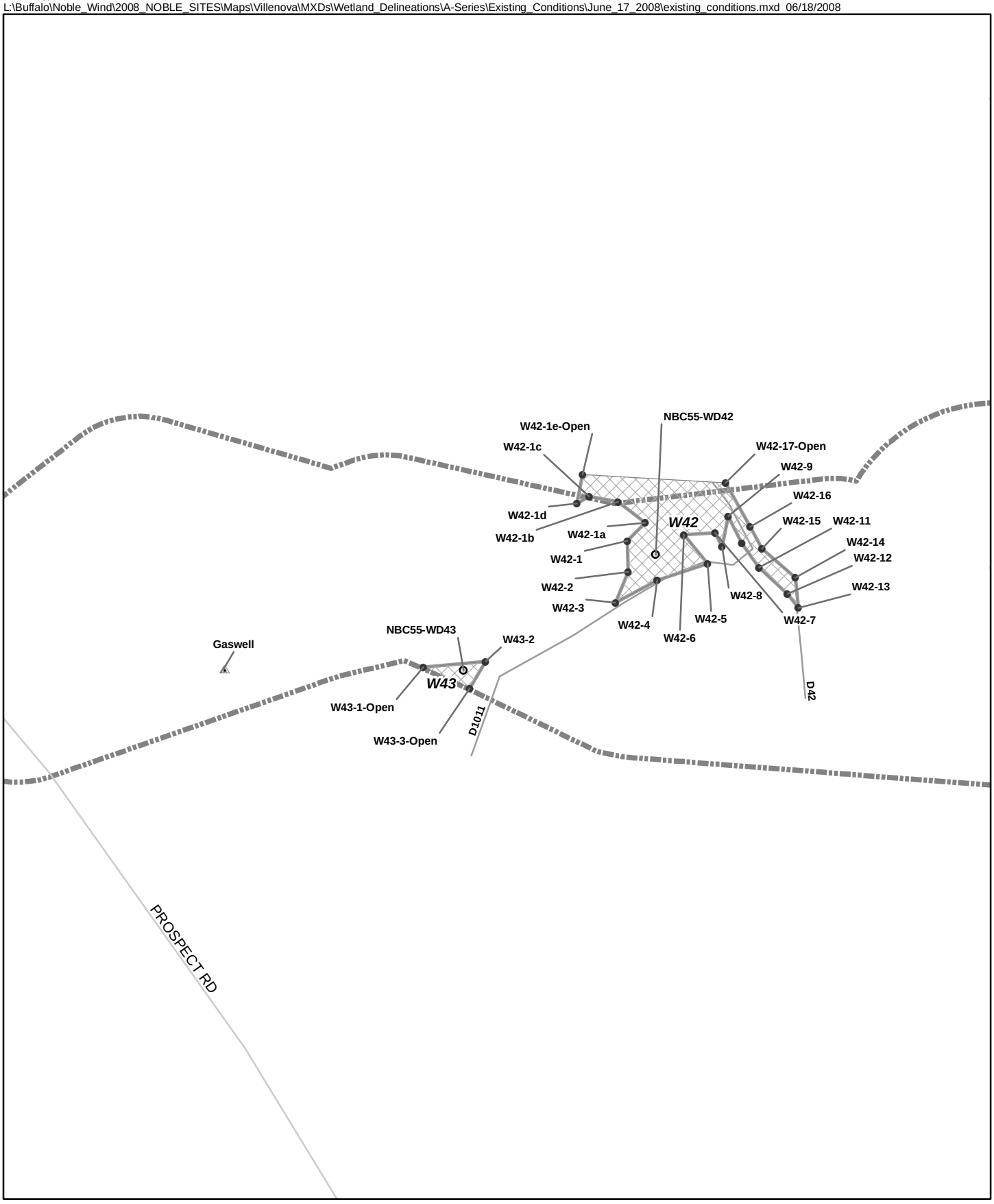

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-5
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

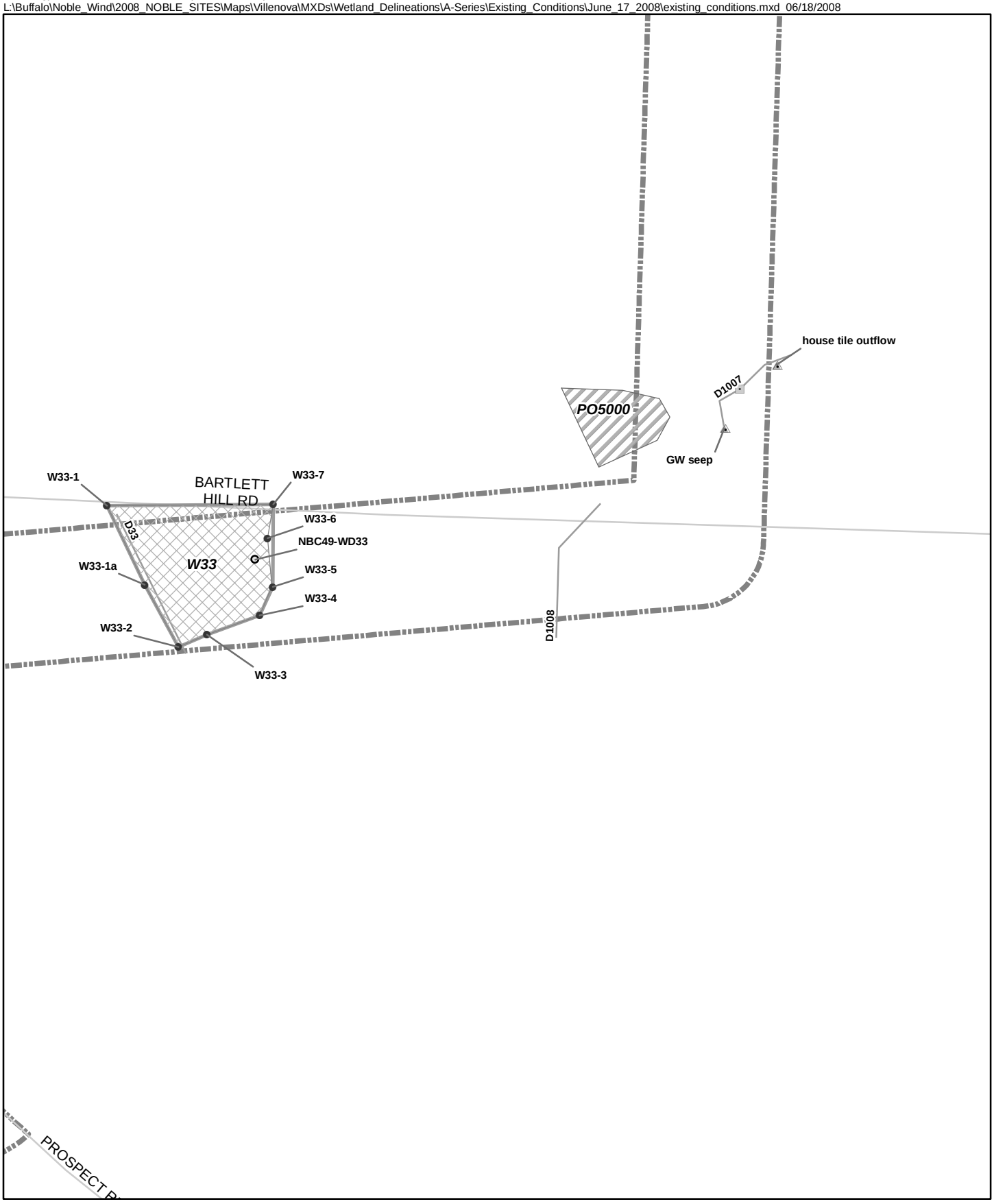
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-6
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



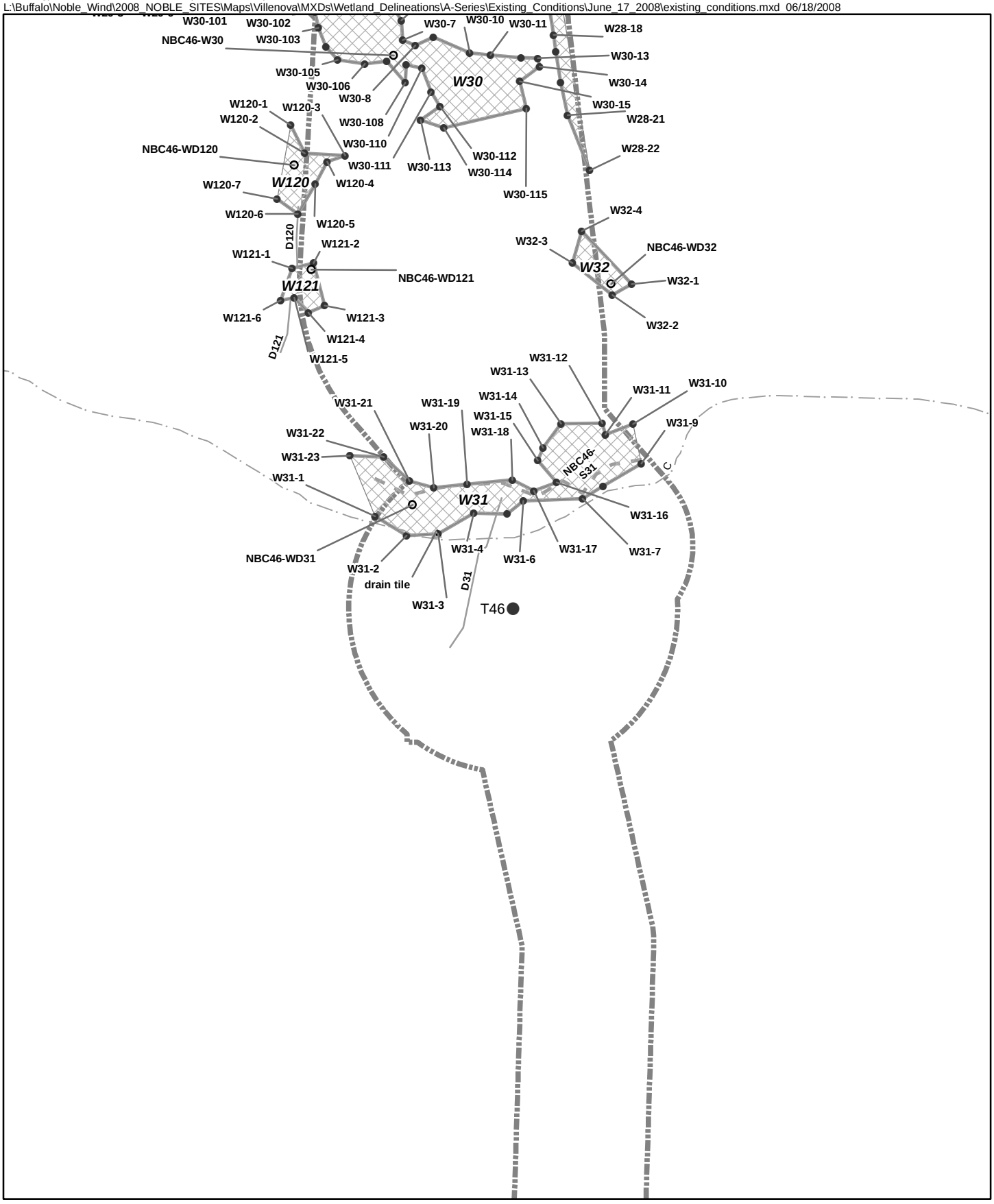

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-7
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

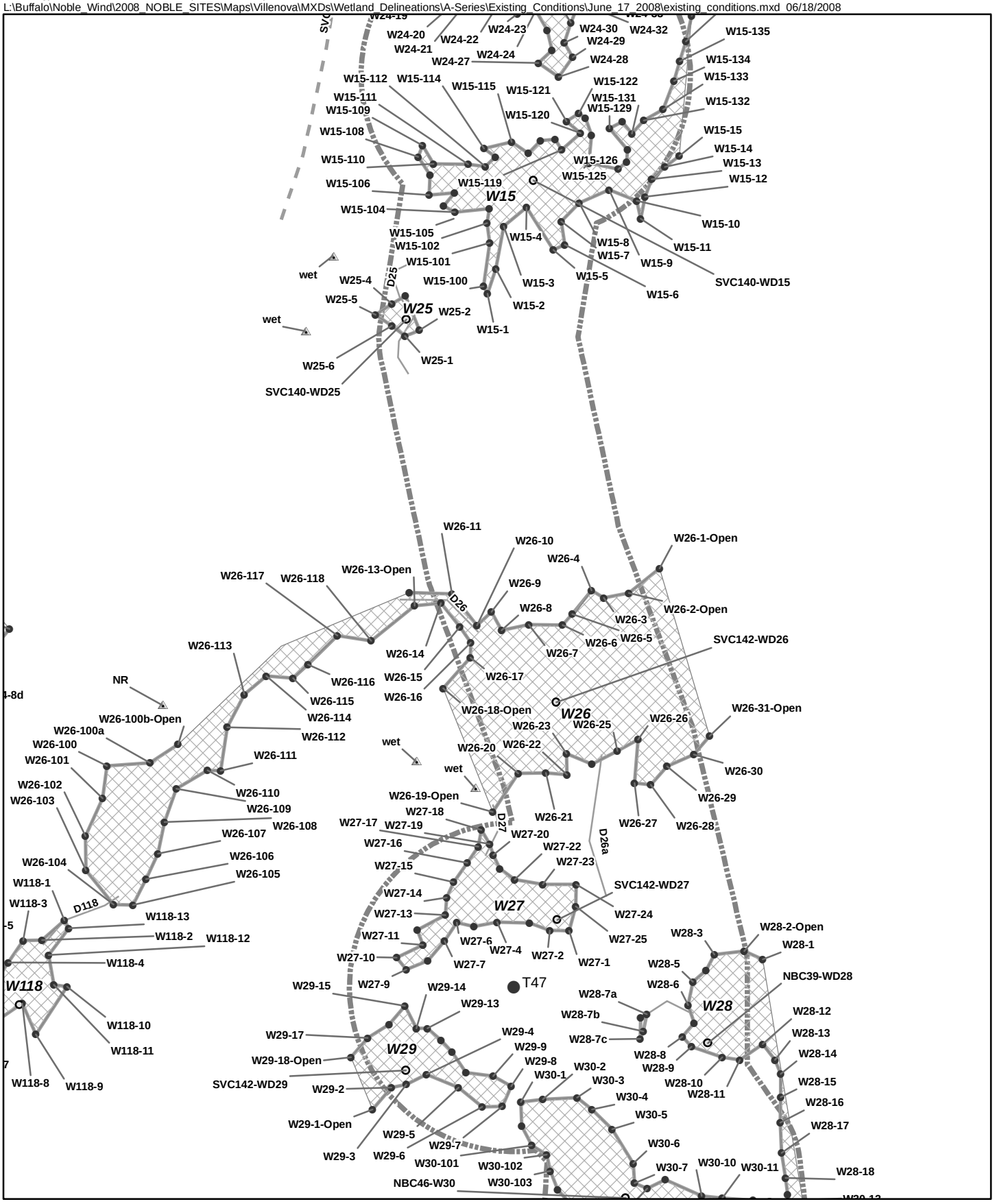
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-8
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet



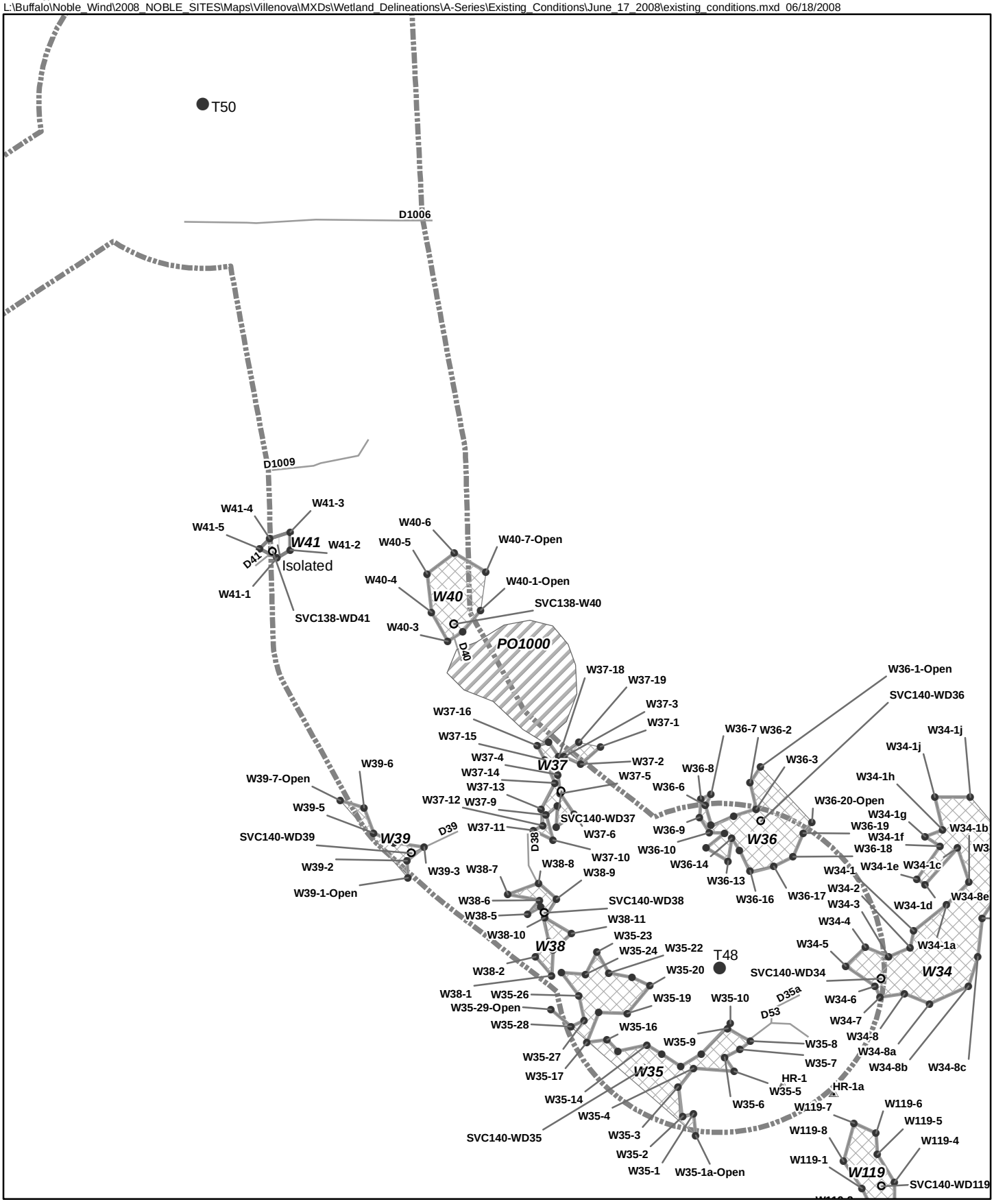

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-9
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



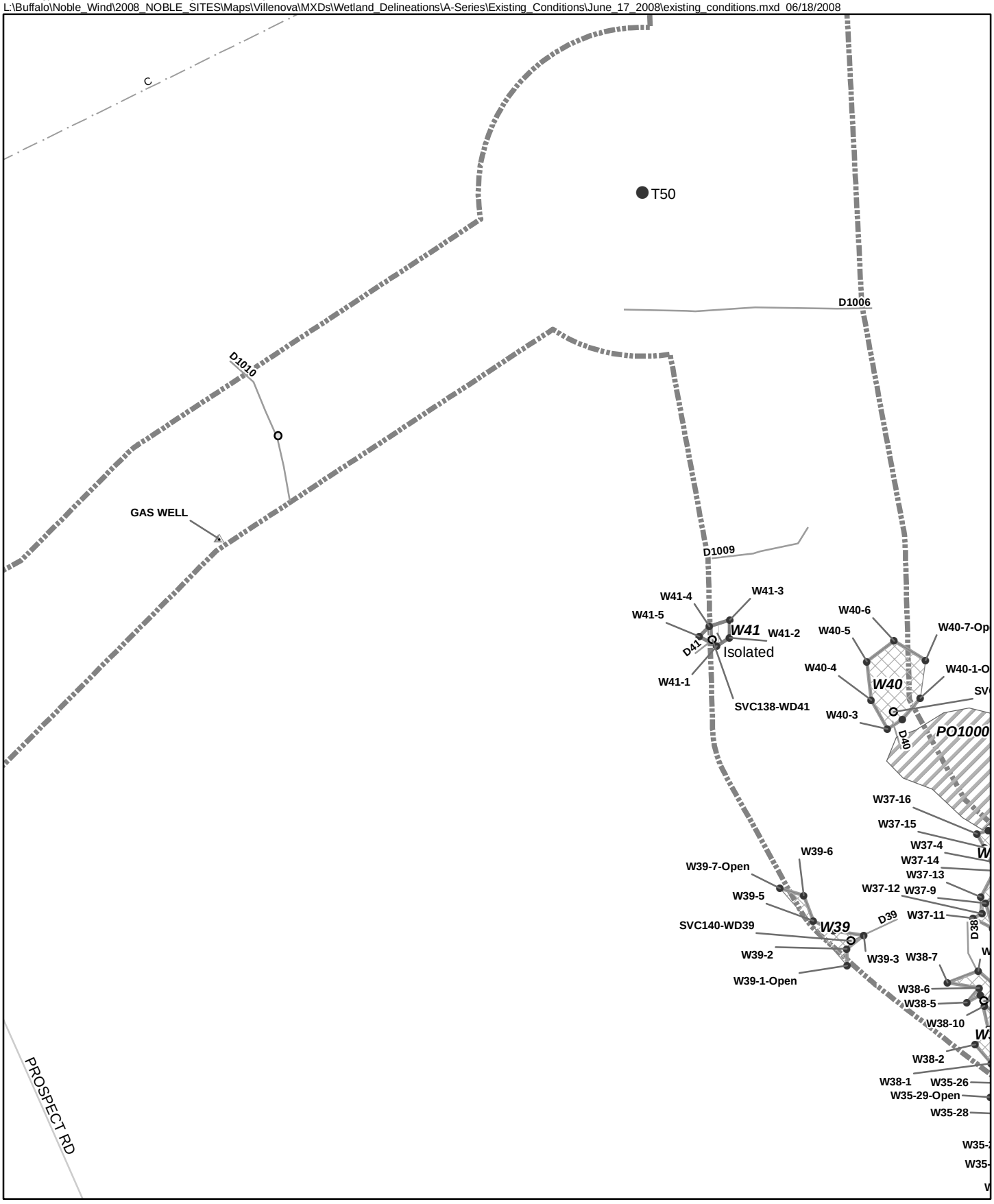

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-10
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



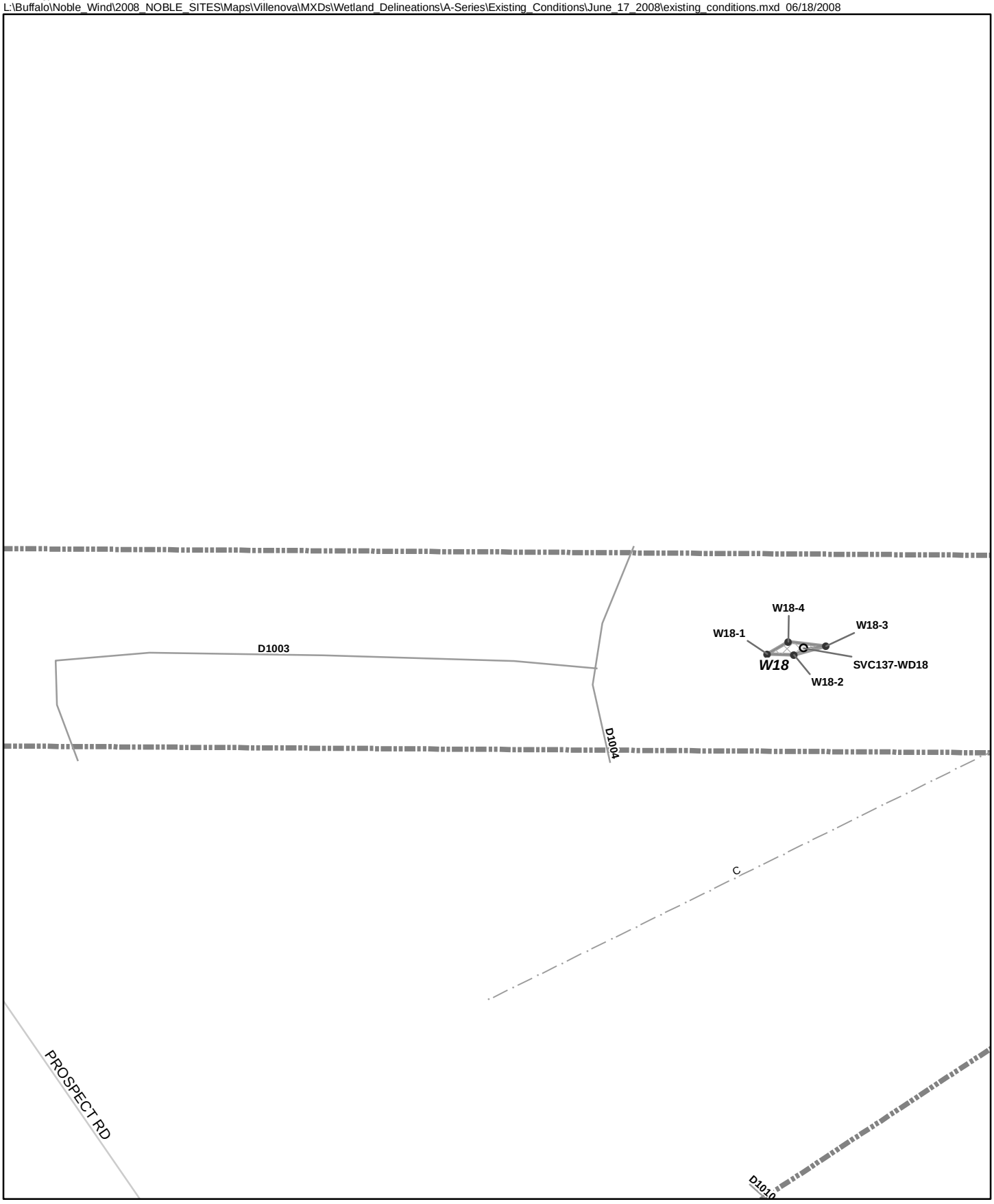

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-11
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



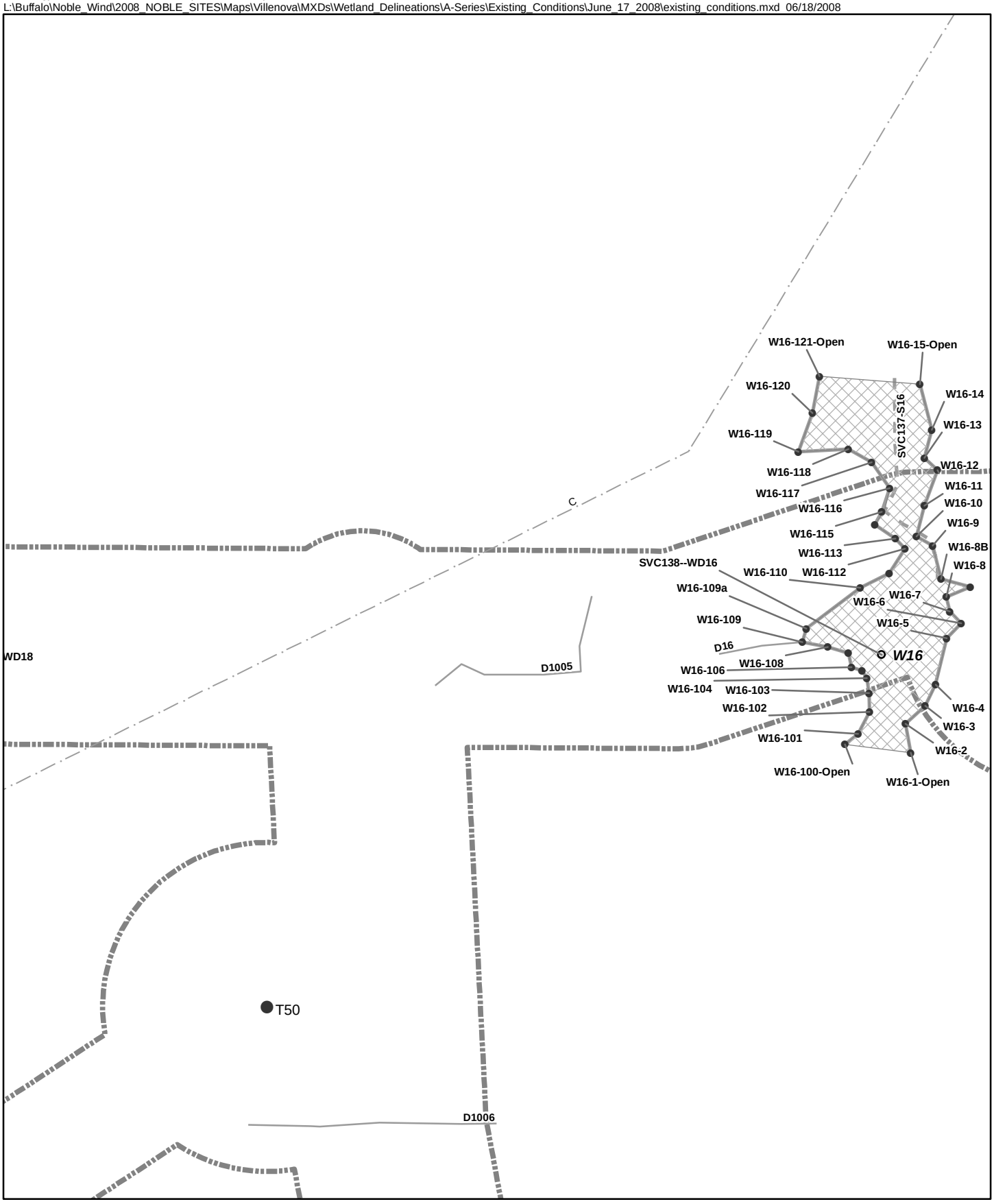

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-12
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-13
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet



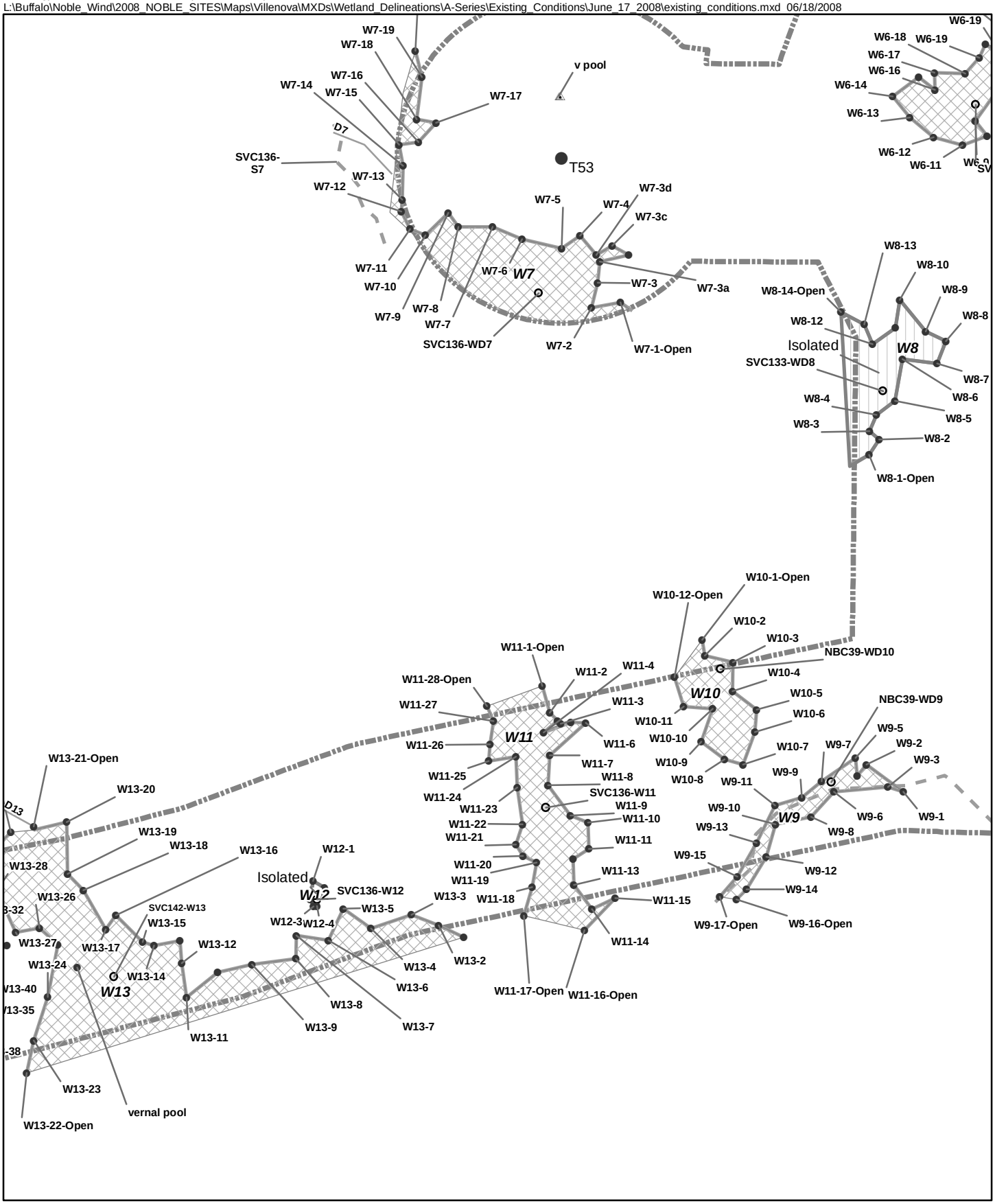

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-14
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



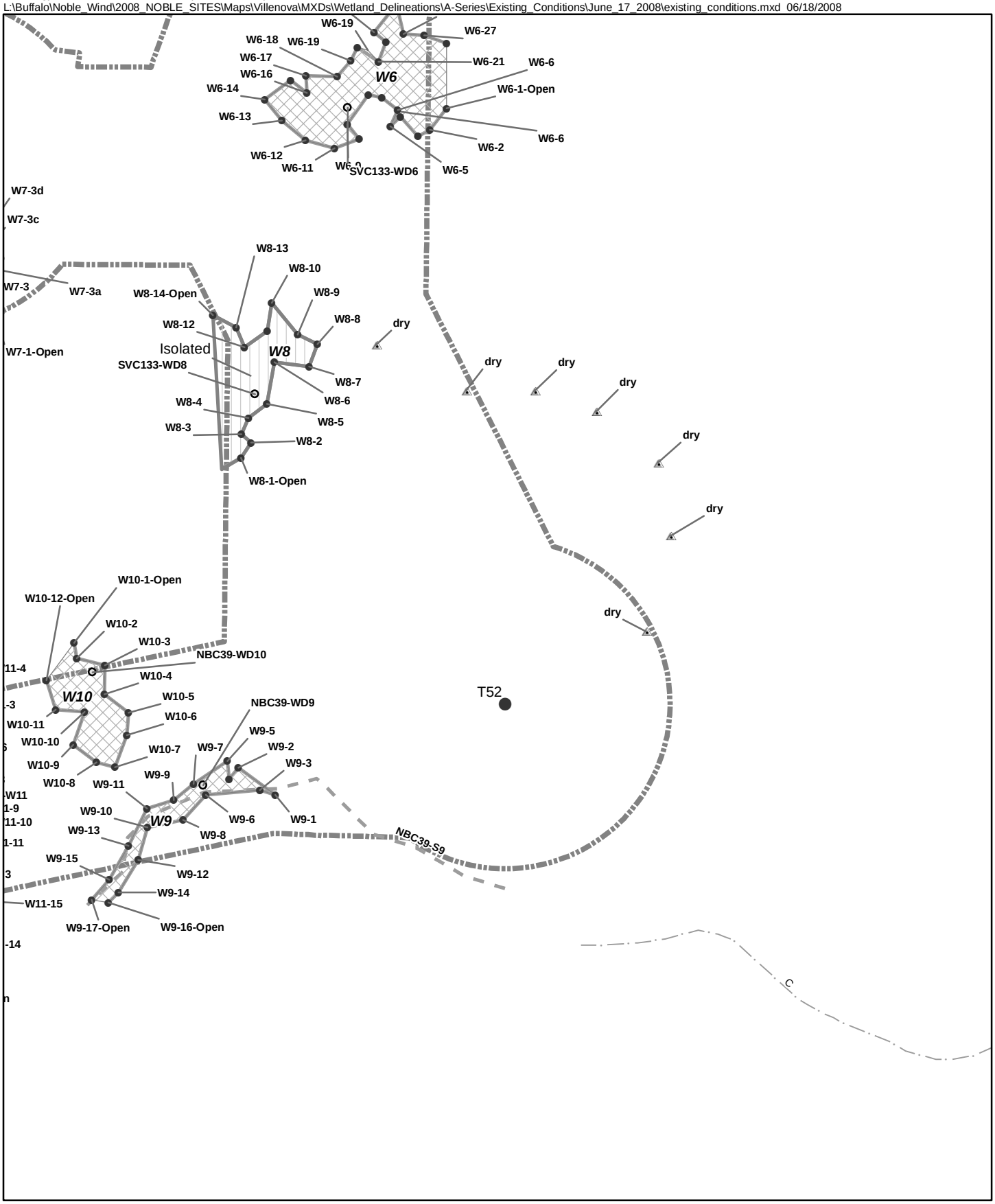

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-15
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



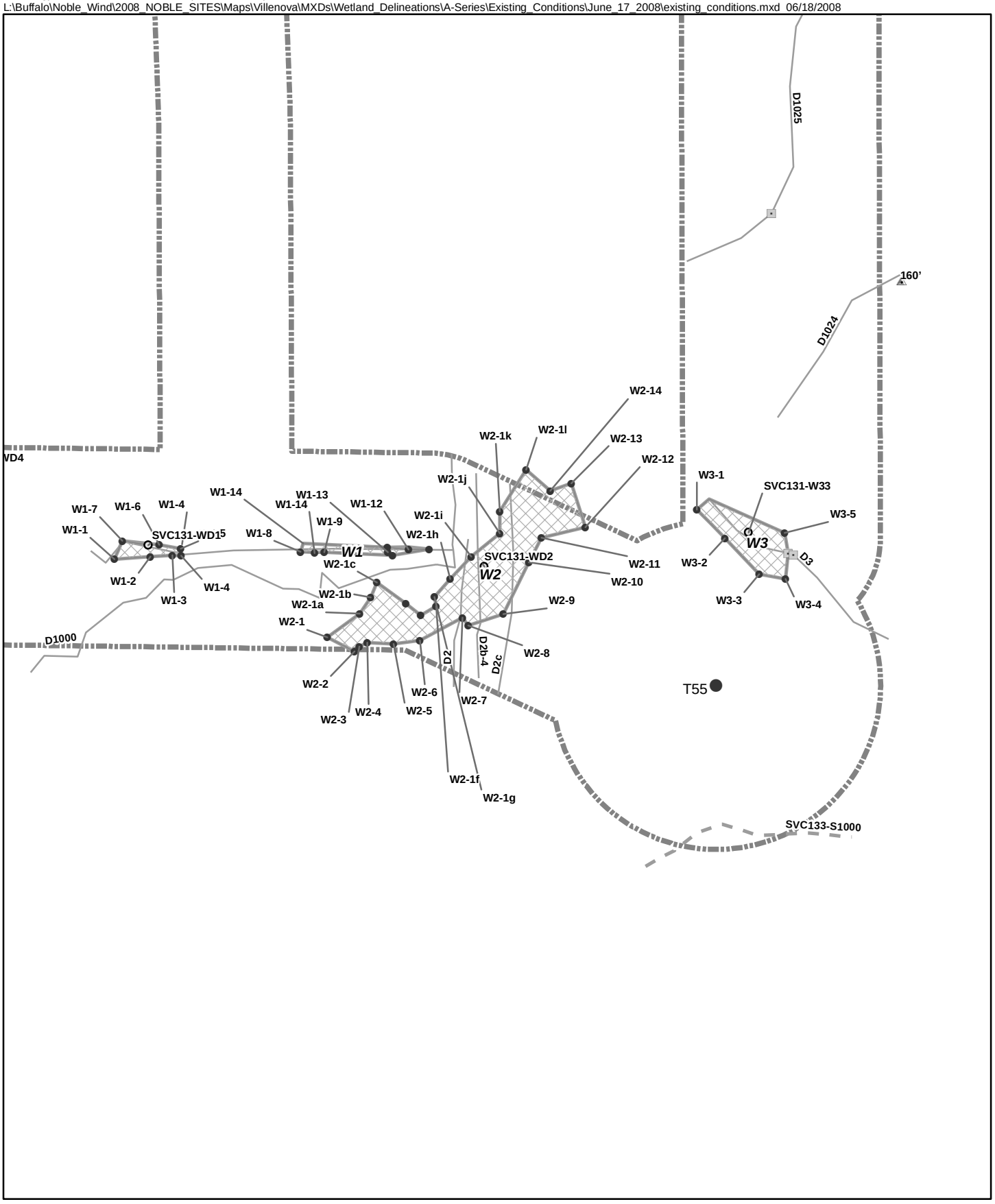

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-16
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-17
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame D-18
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet

' Ecology & Environment, Inc. GIS Department Project #002270.NP32.02
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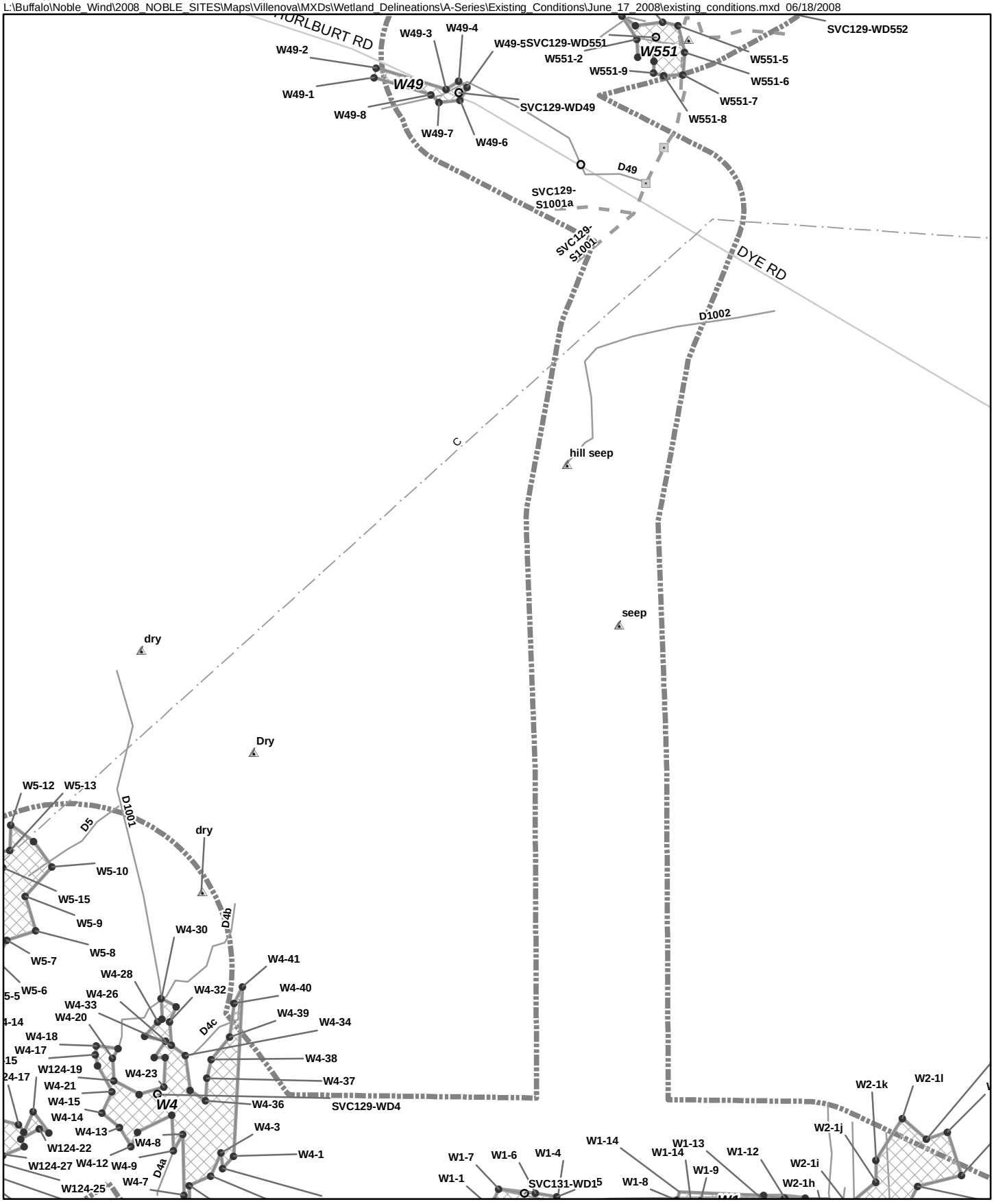


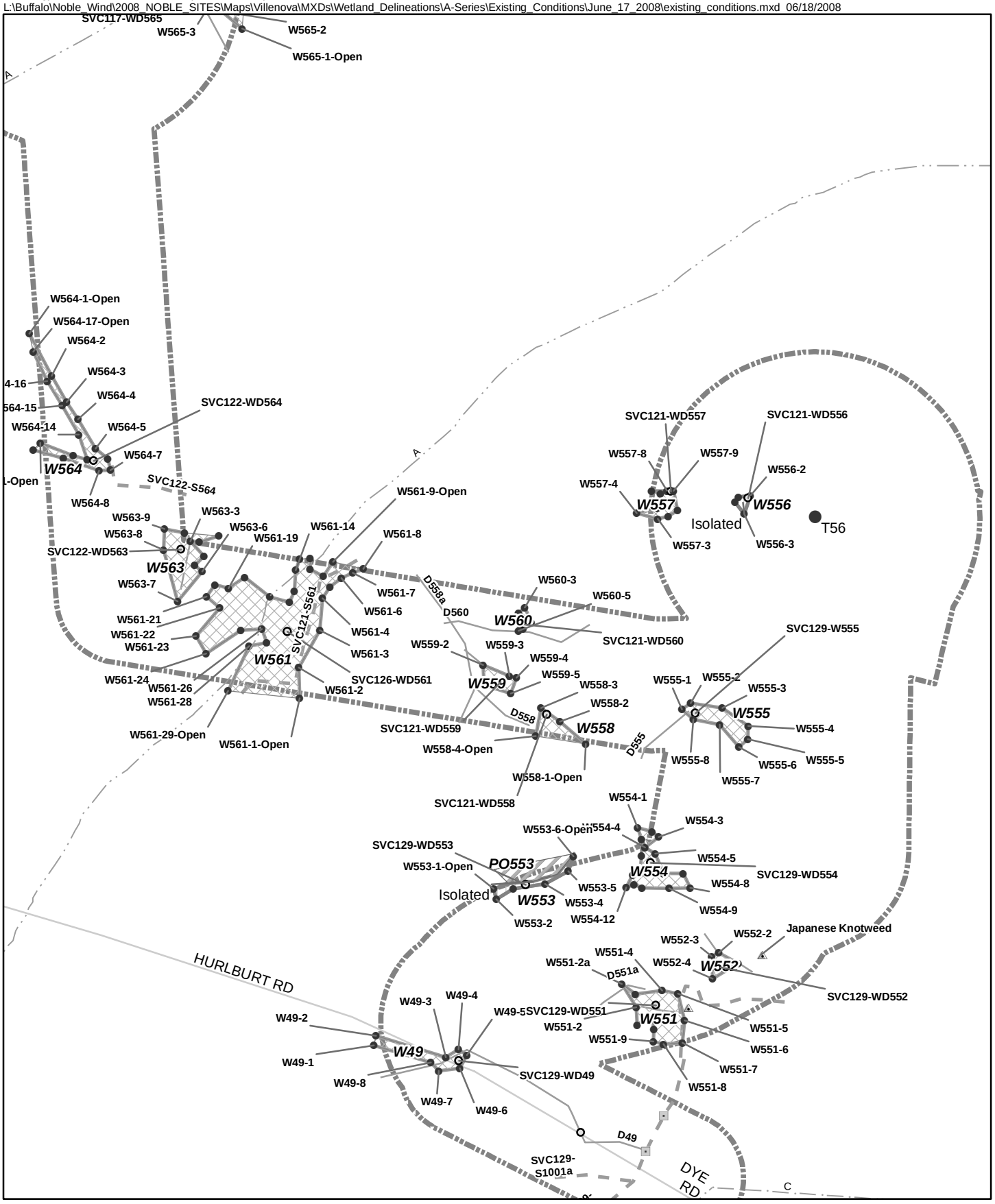

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame D-19
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

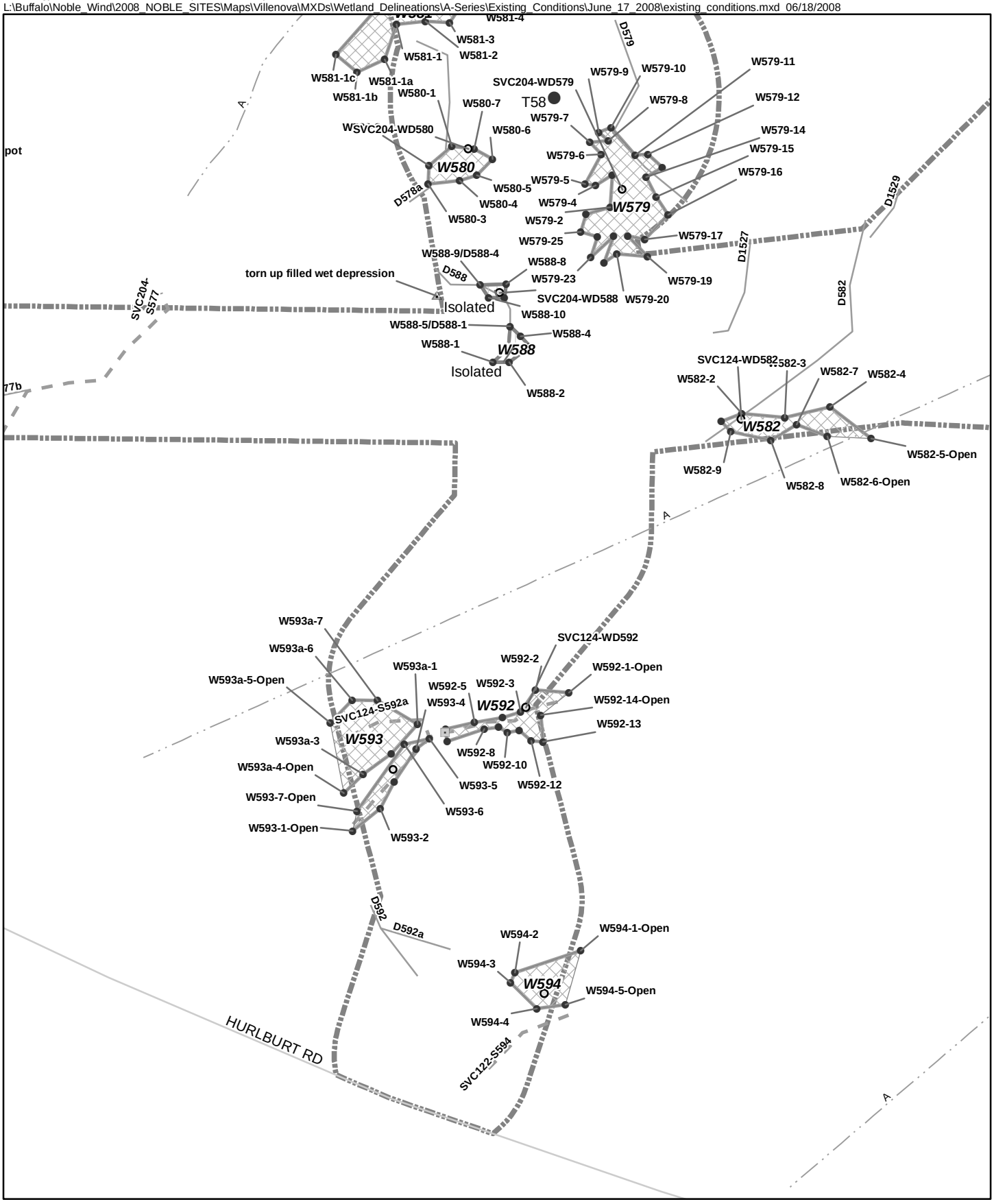
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-1
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



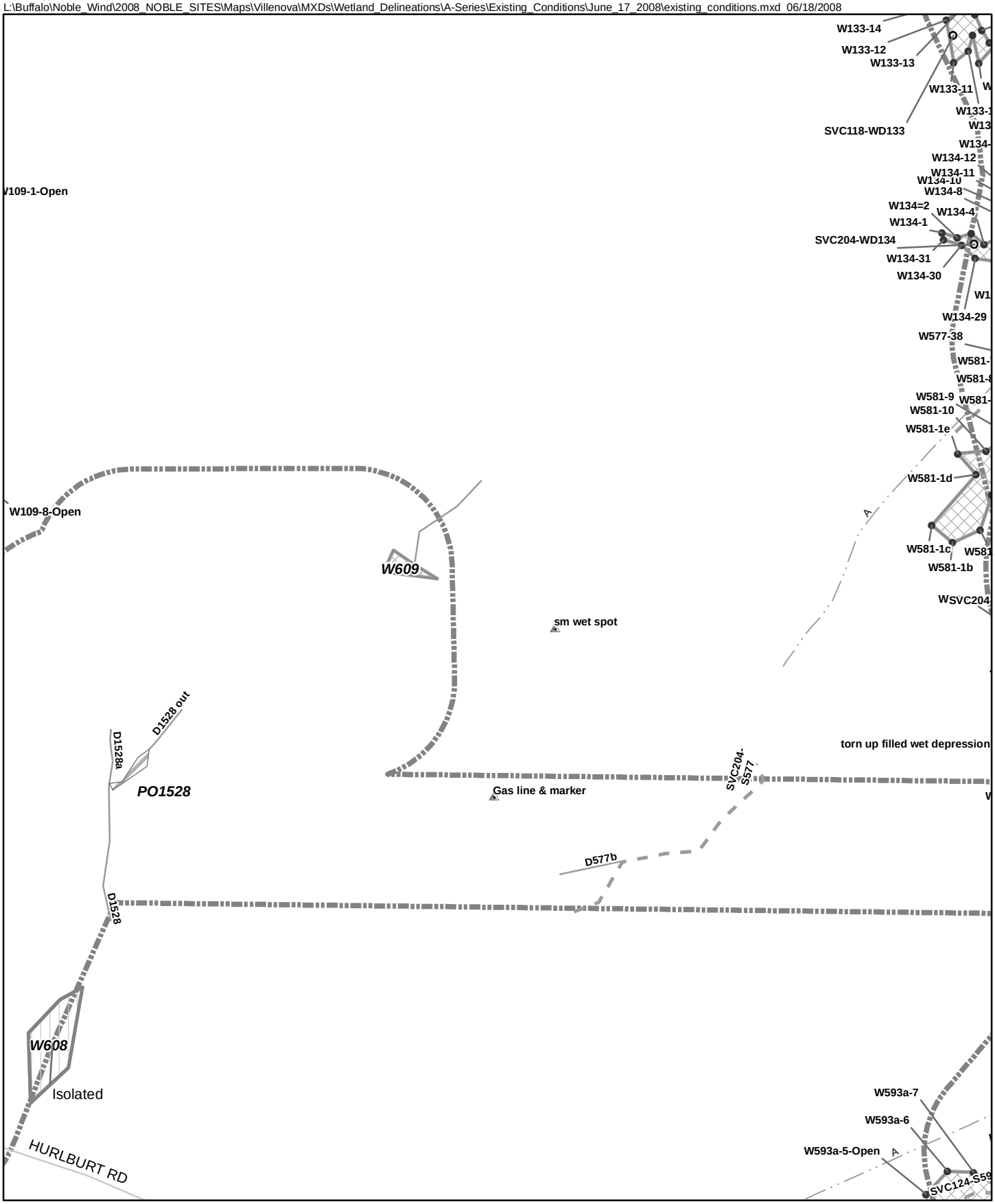

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-2
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet




- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame E-3
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



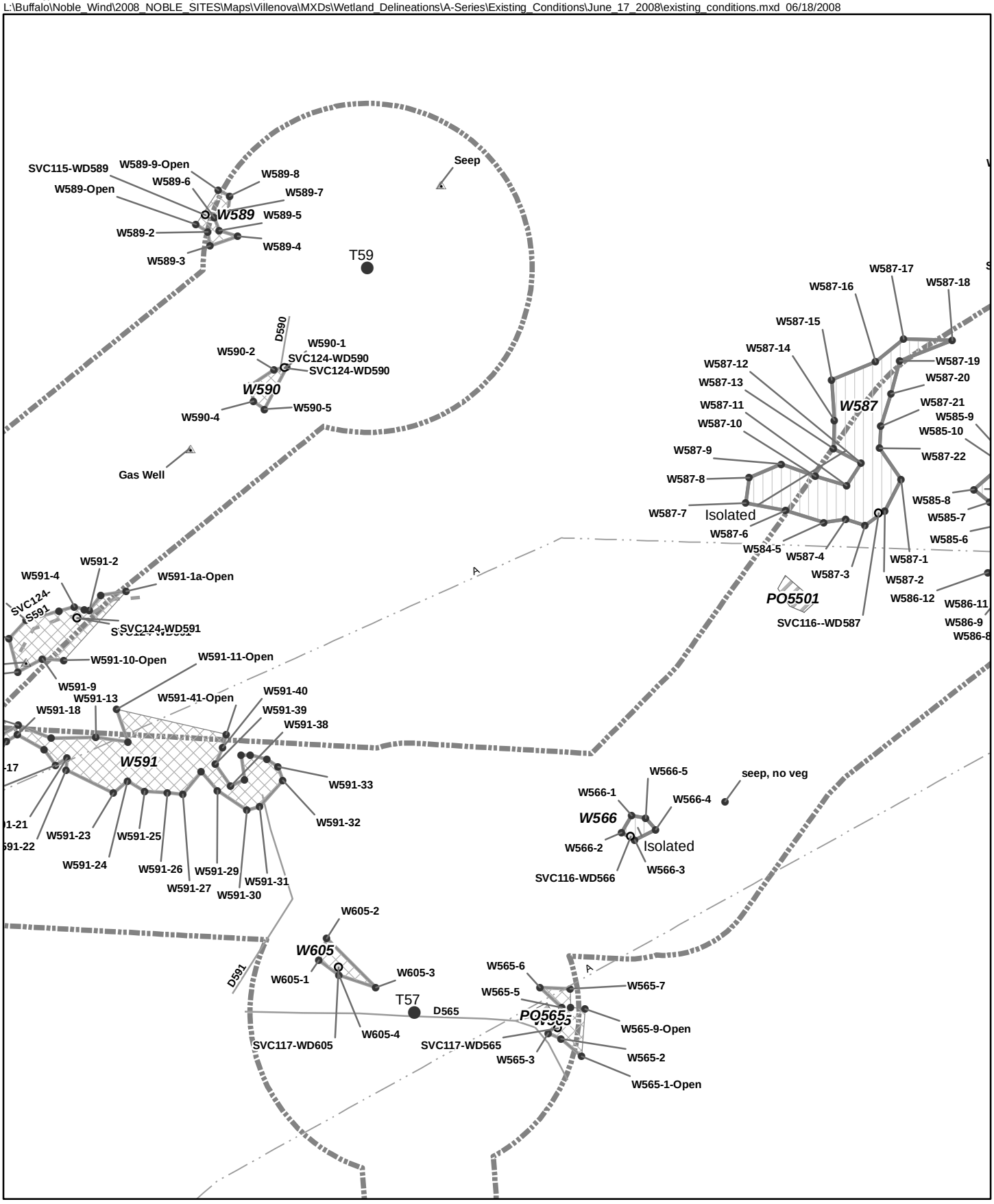

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame E-4
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

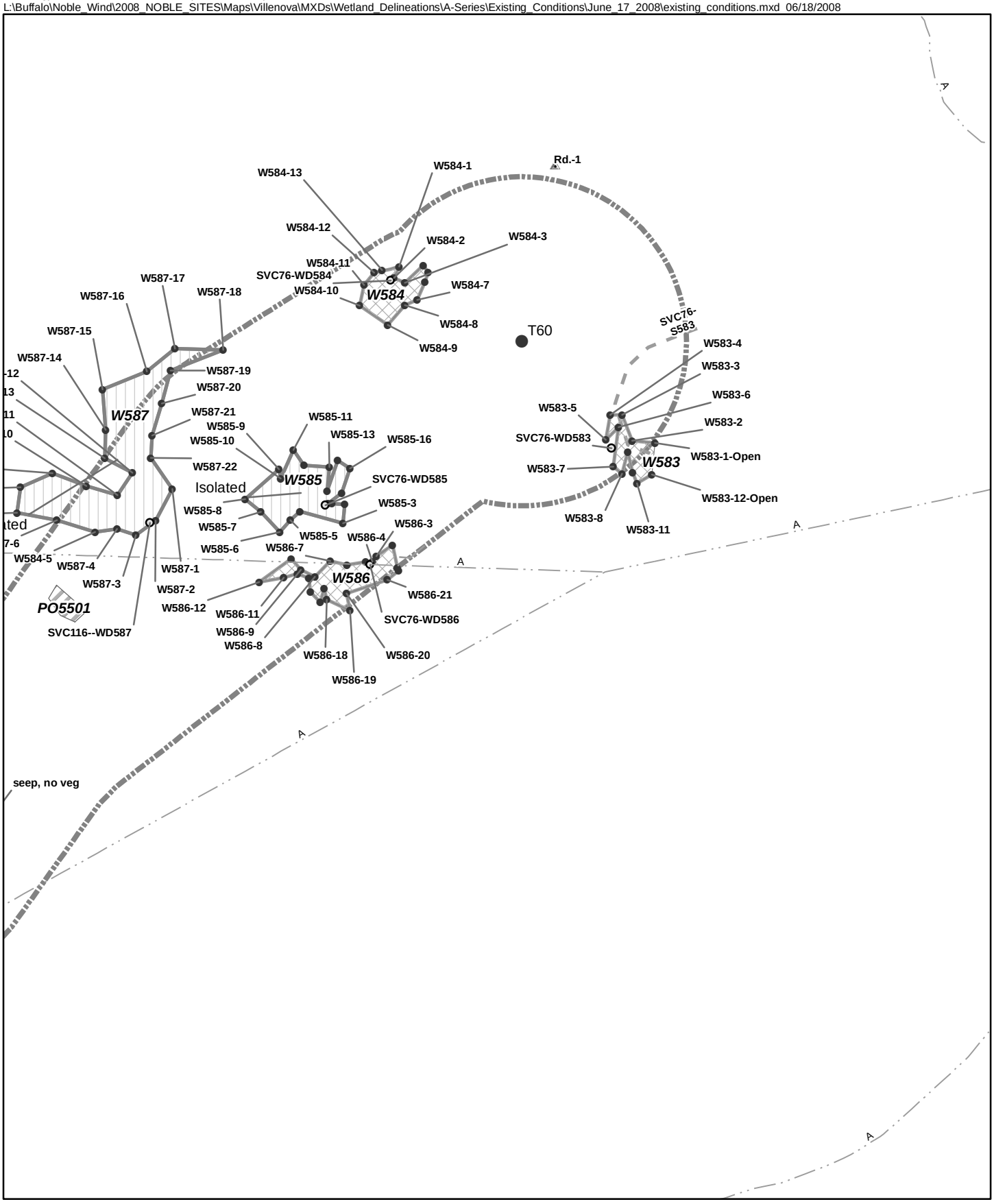
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-5
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-6
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



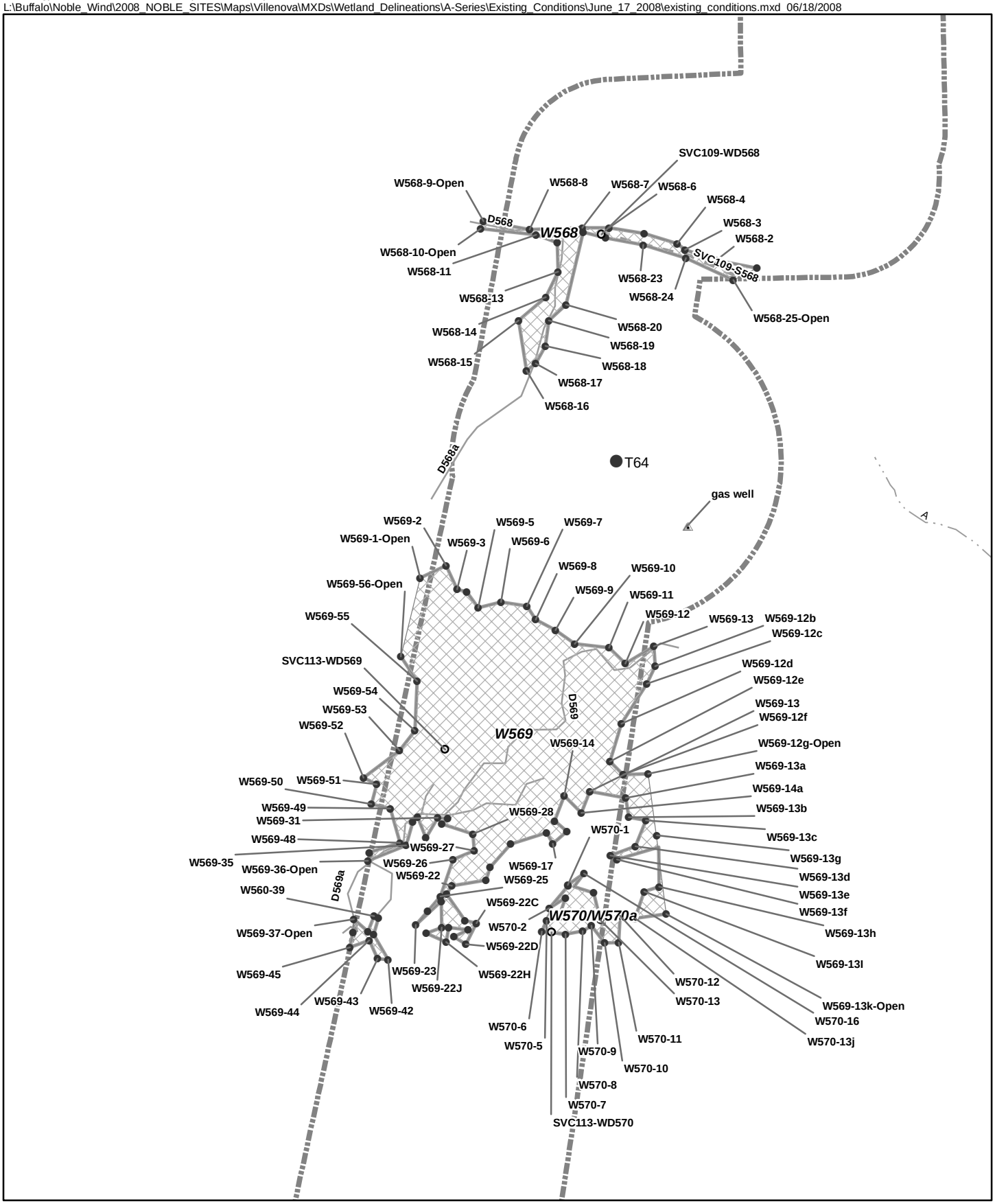

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-7
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

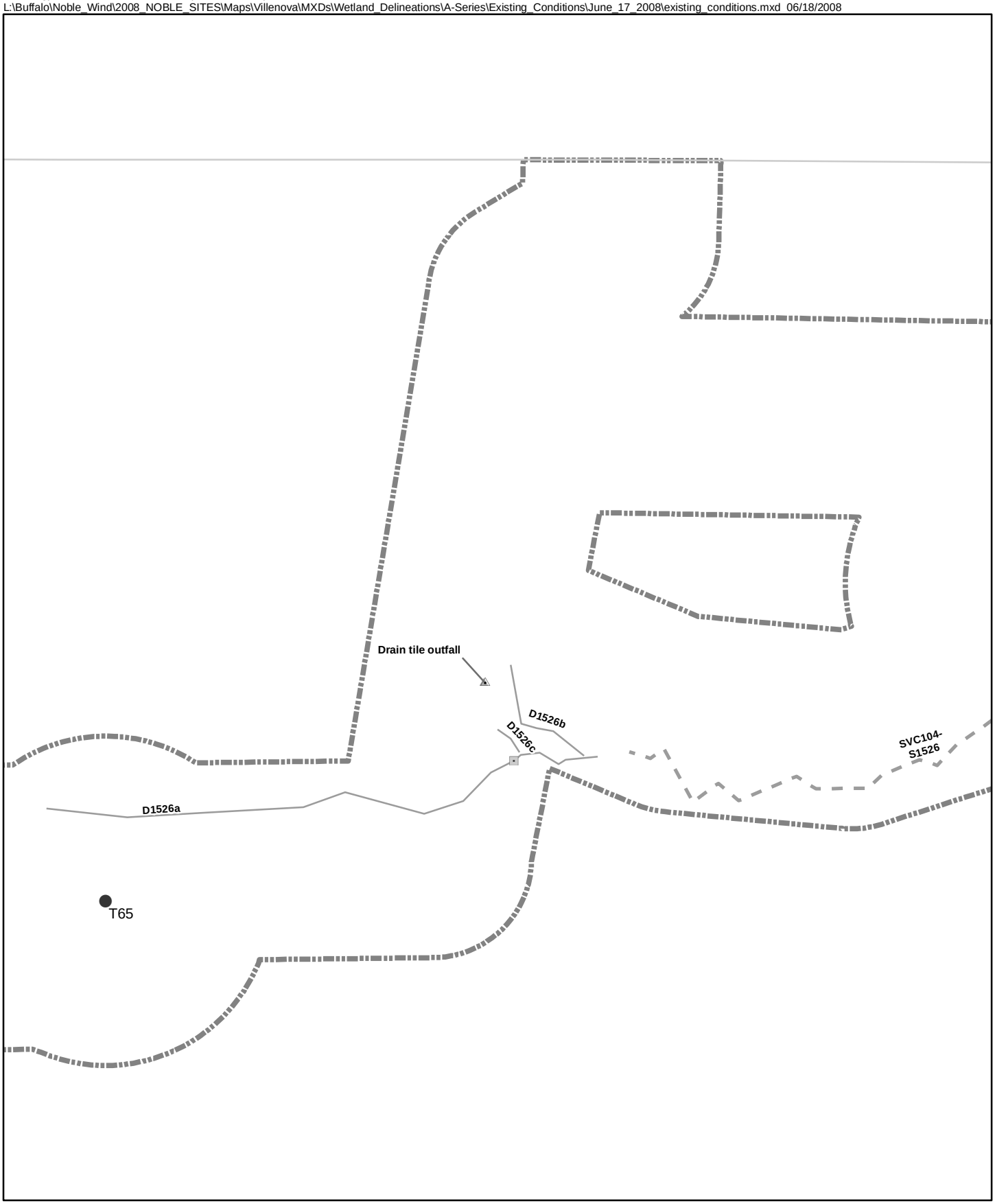
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

# Frame E-8
## Ball Hill Windpark
## Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

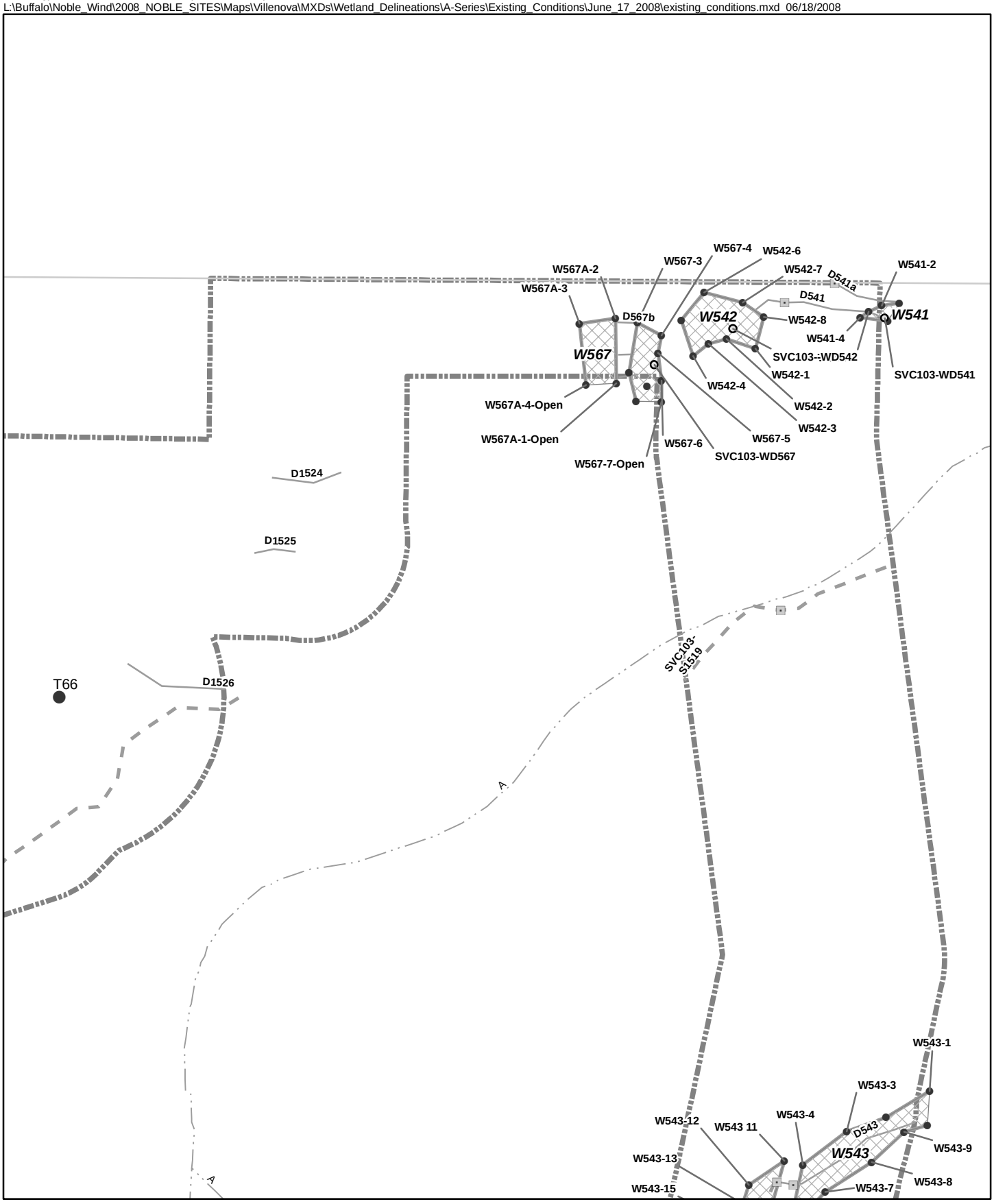
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-9
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

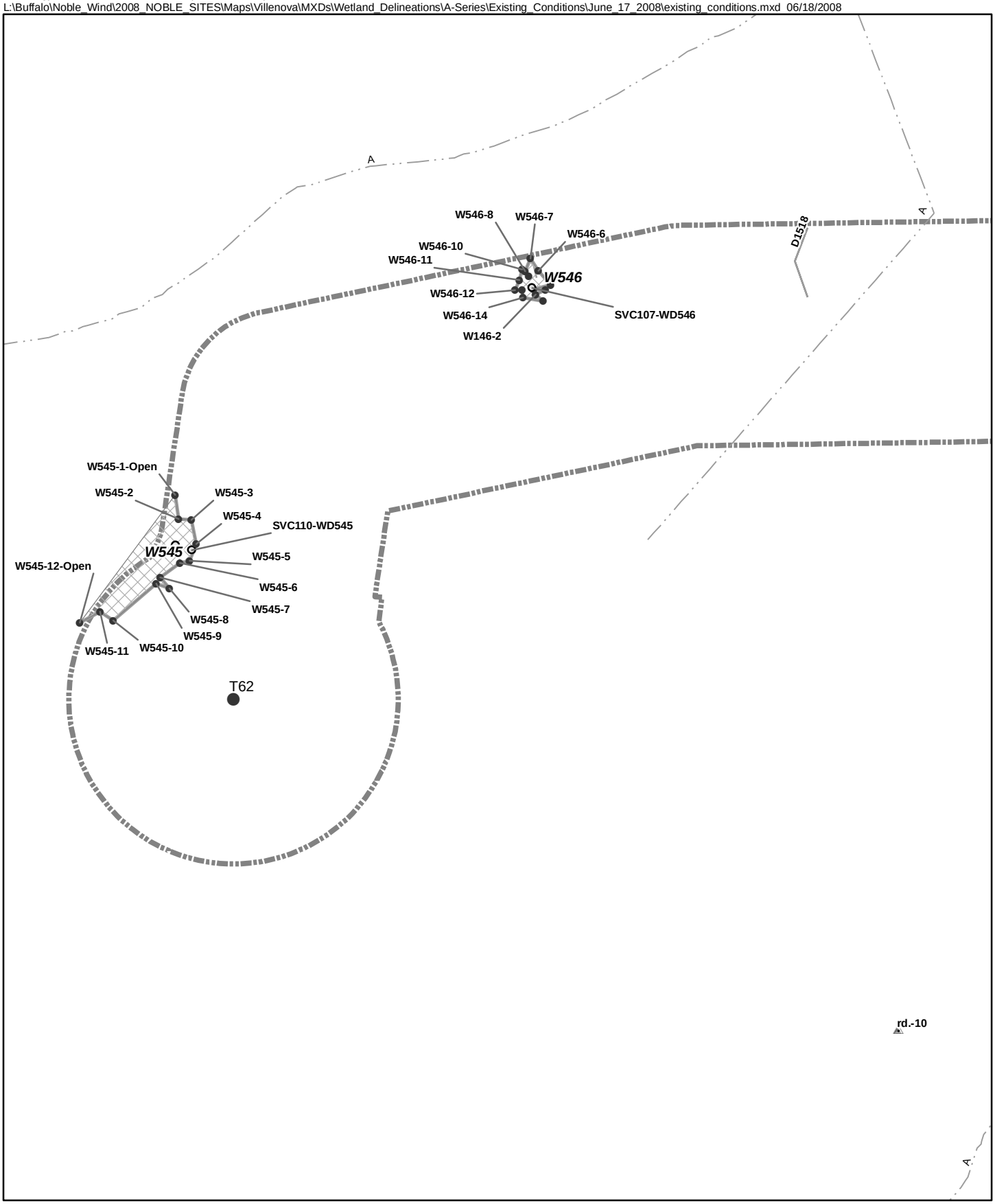
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-10
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-11
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet

' Ecology & Environment, Inc. GIS Department Project #002270.NP32.02
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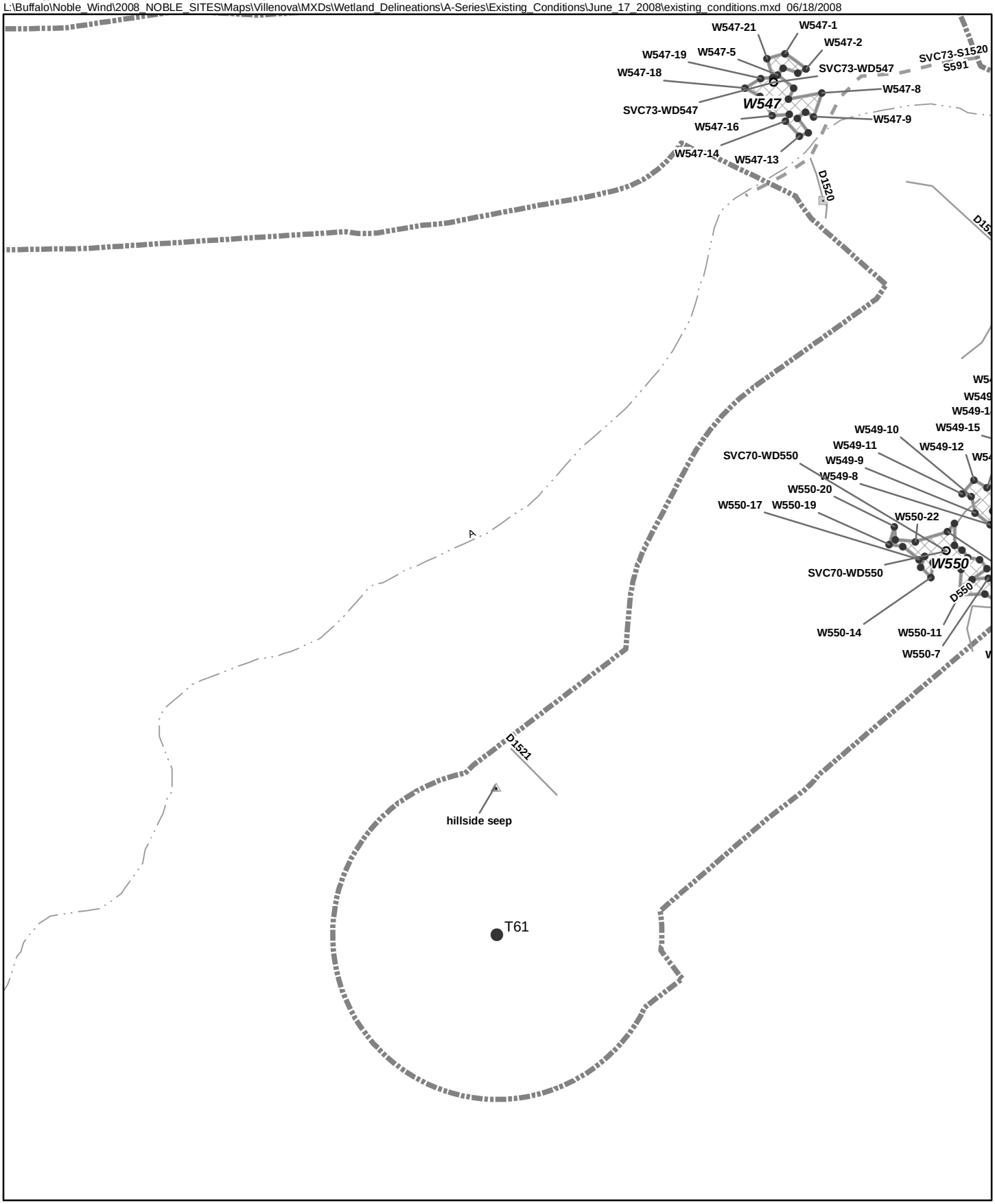



Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

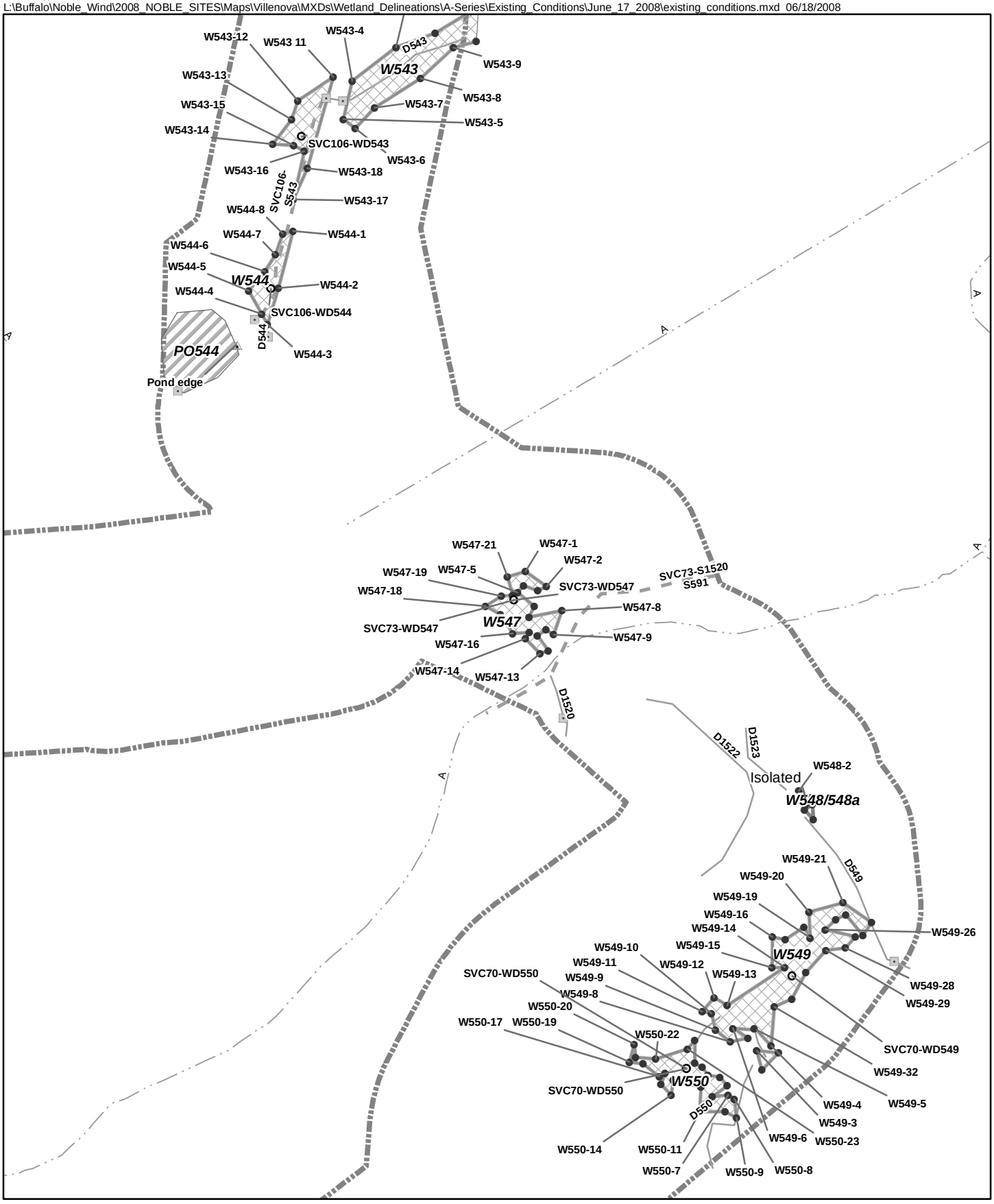
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame E-12
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



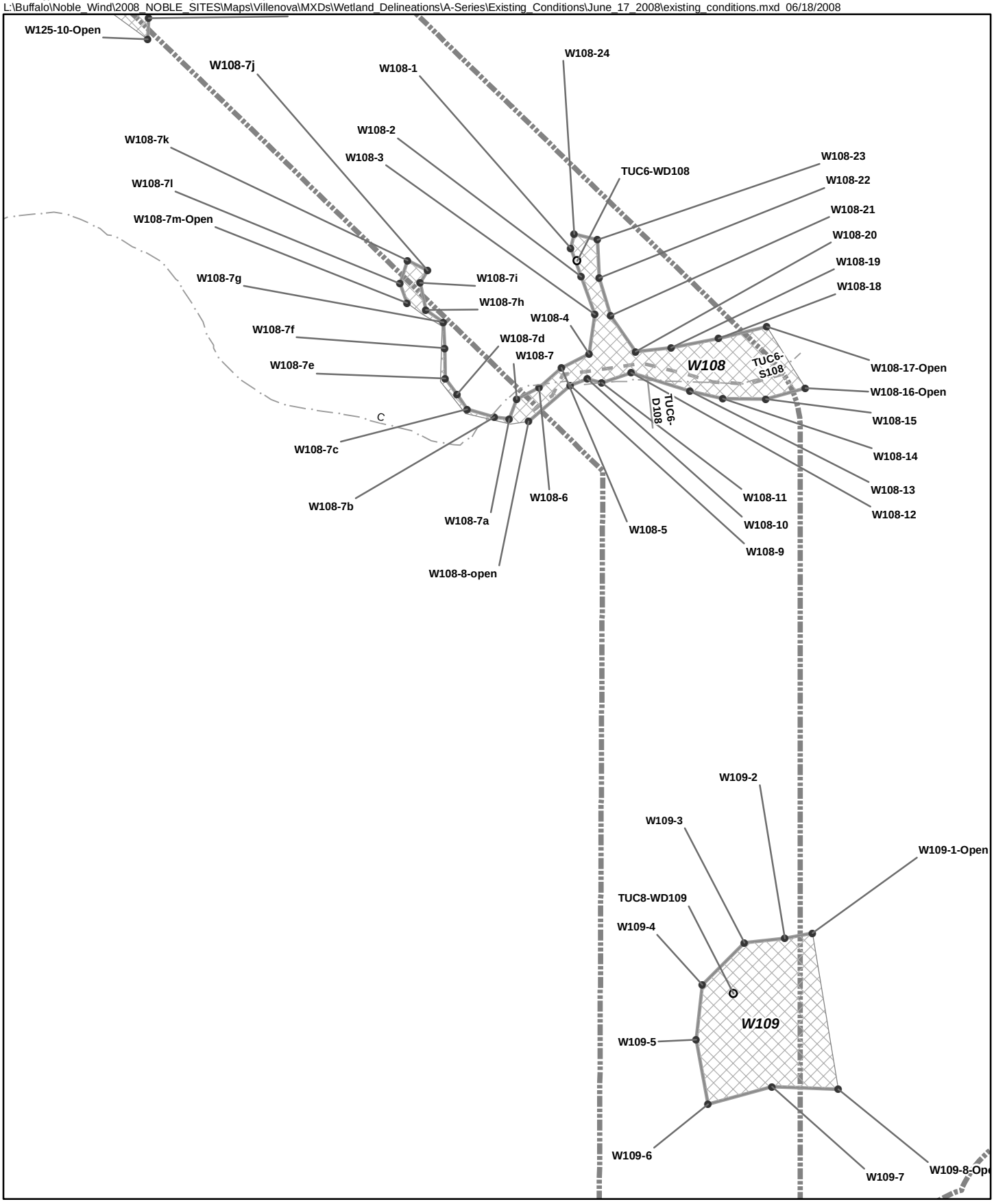

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame E-13
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



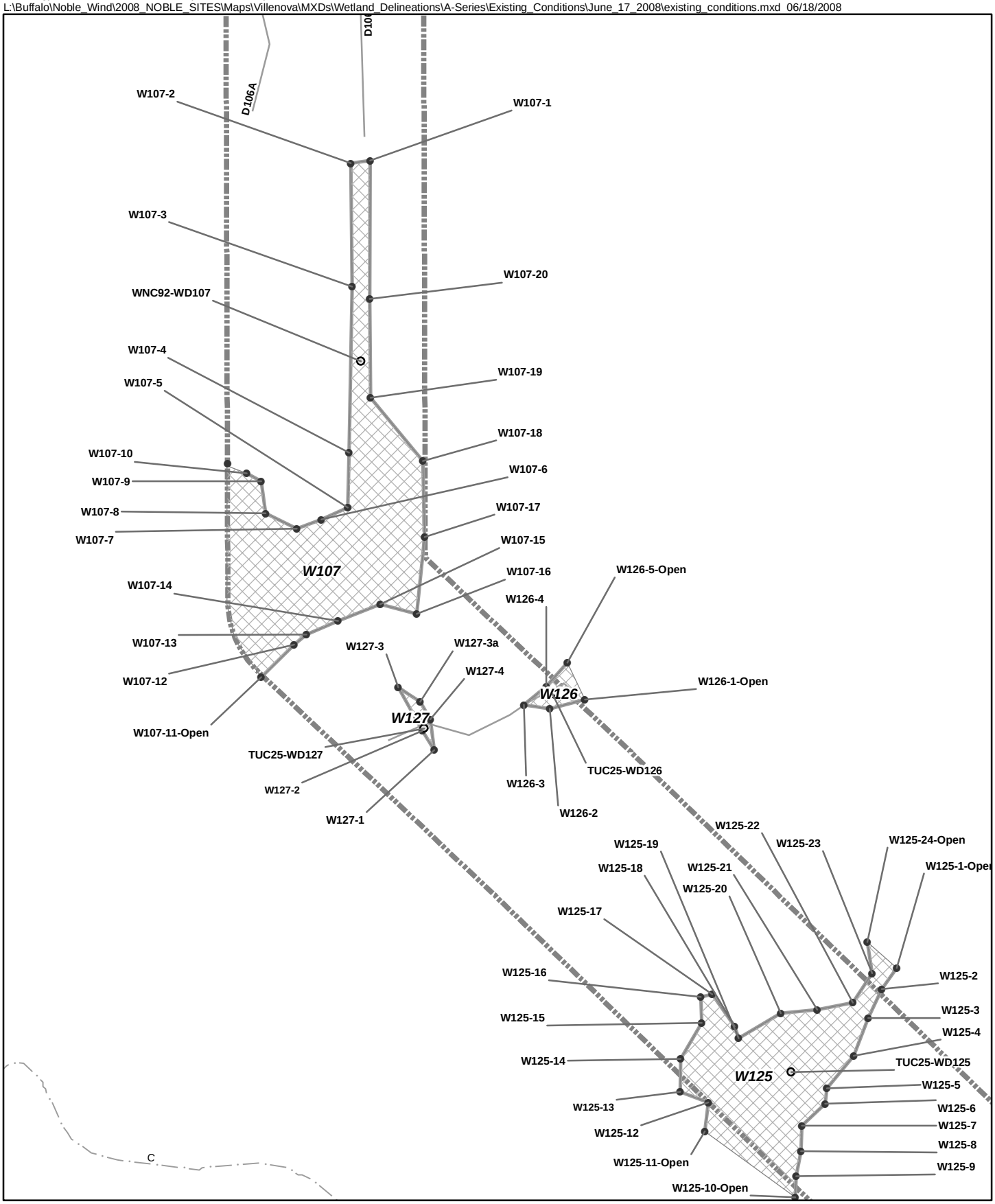

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-1
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



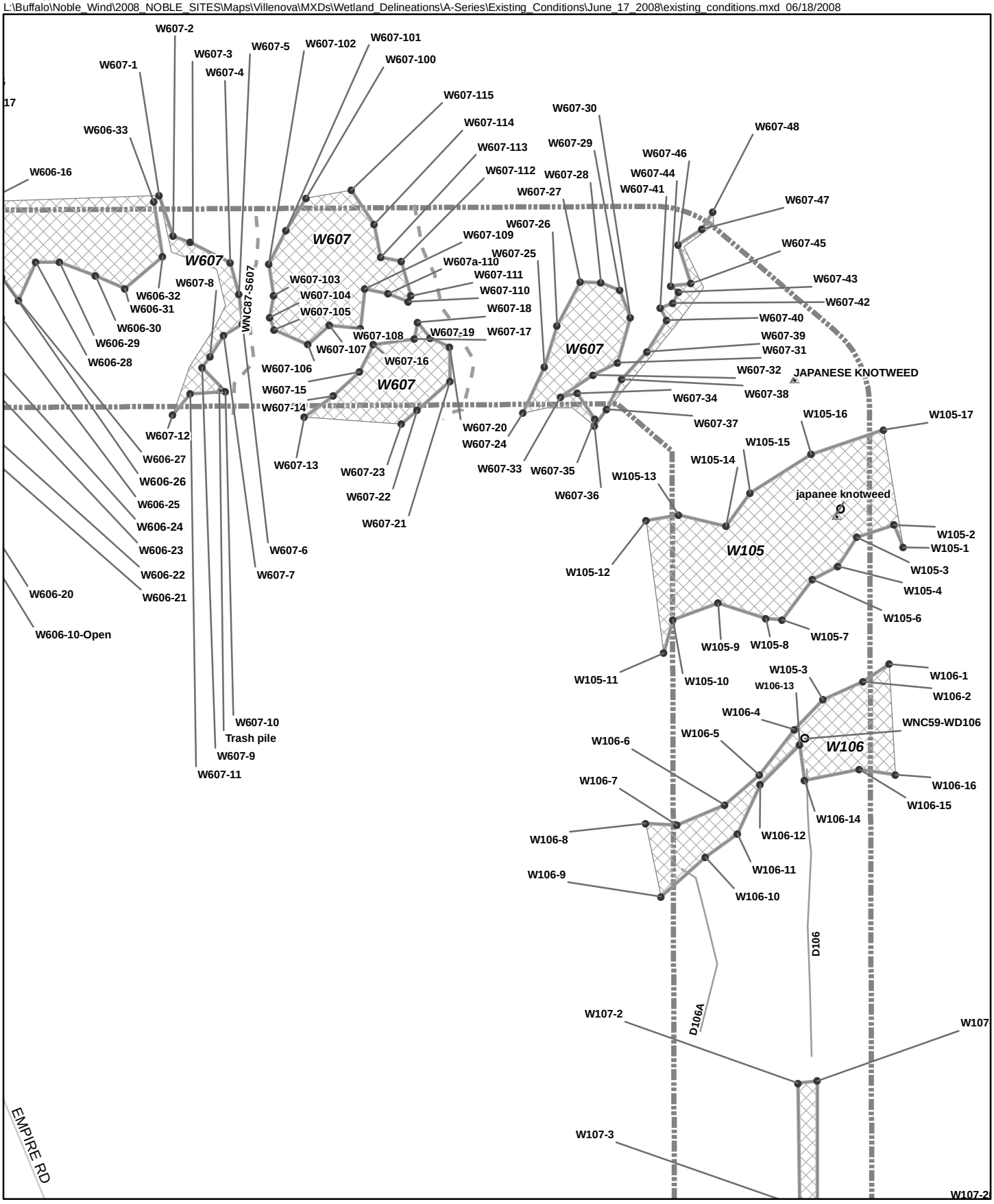

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-2
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-3
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

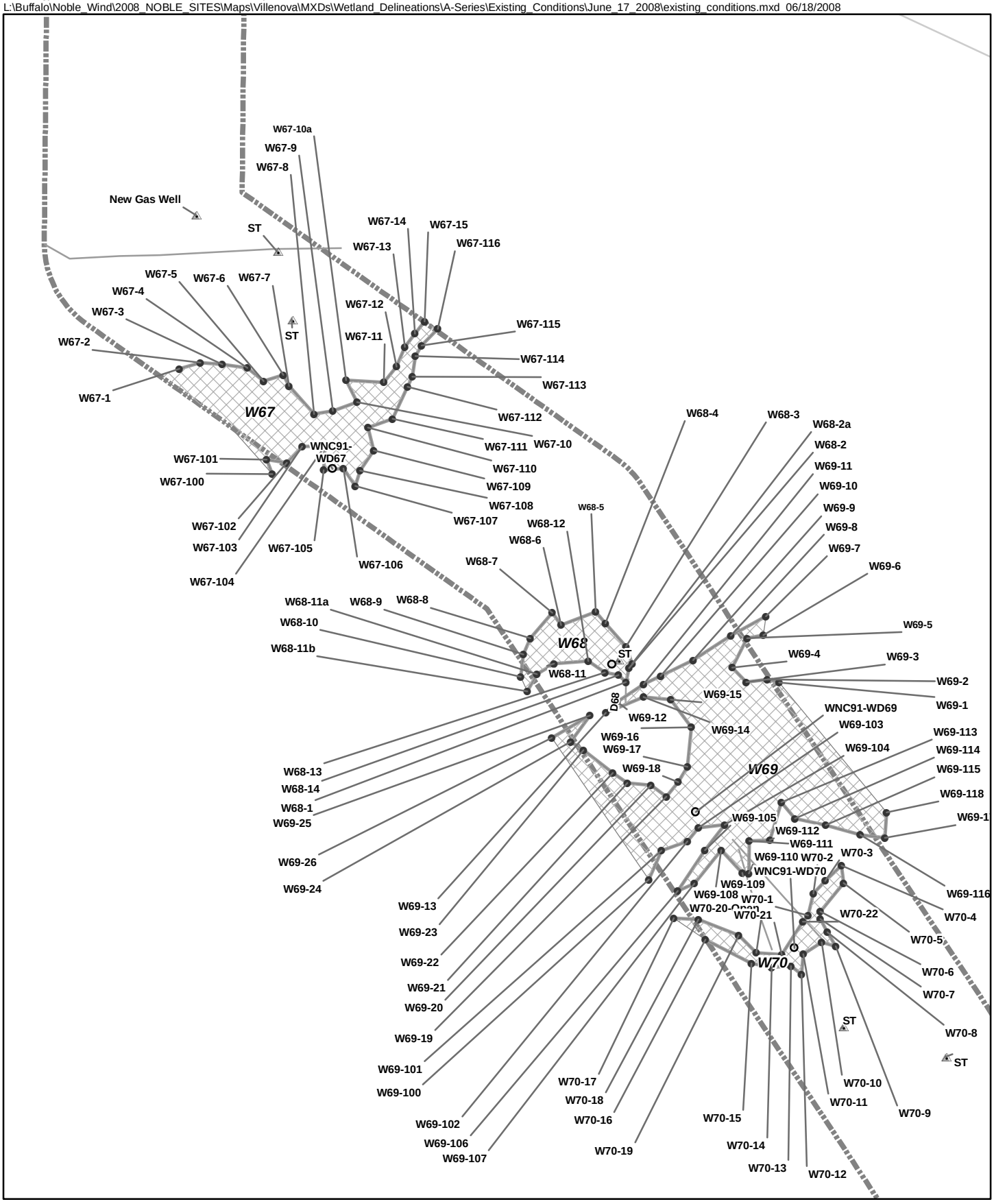
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-4
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet



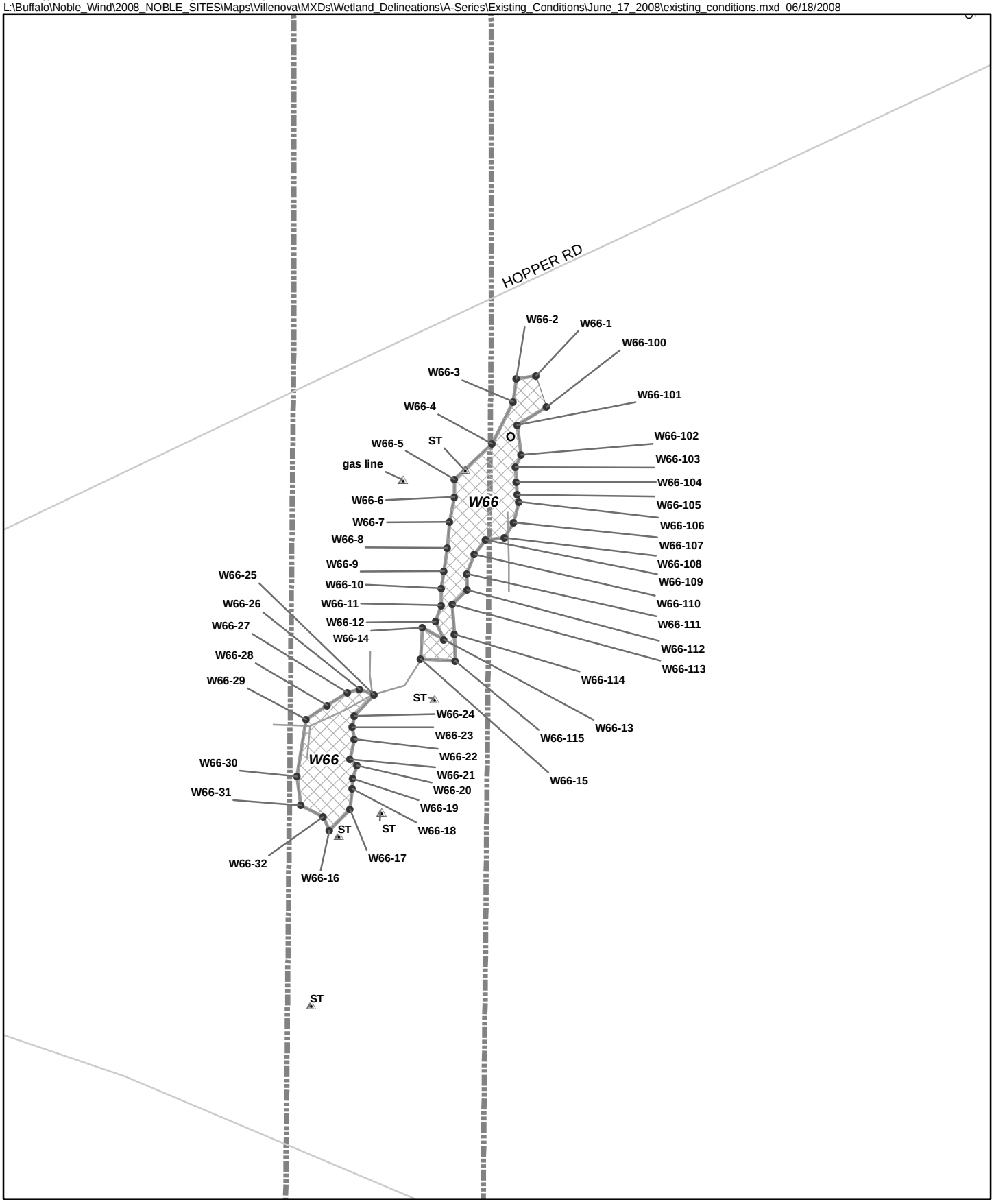

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-5
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

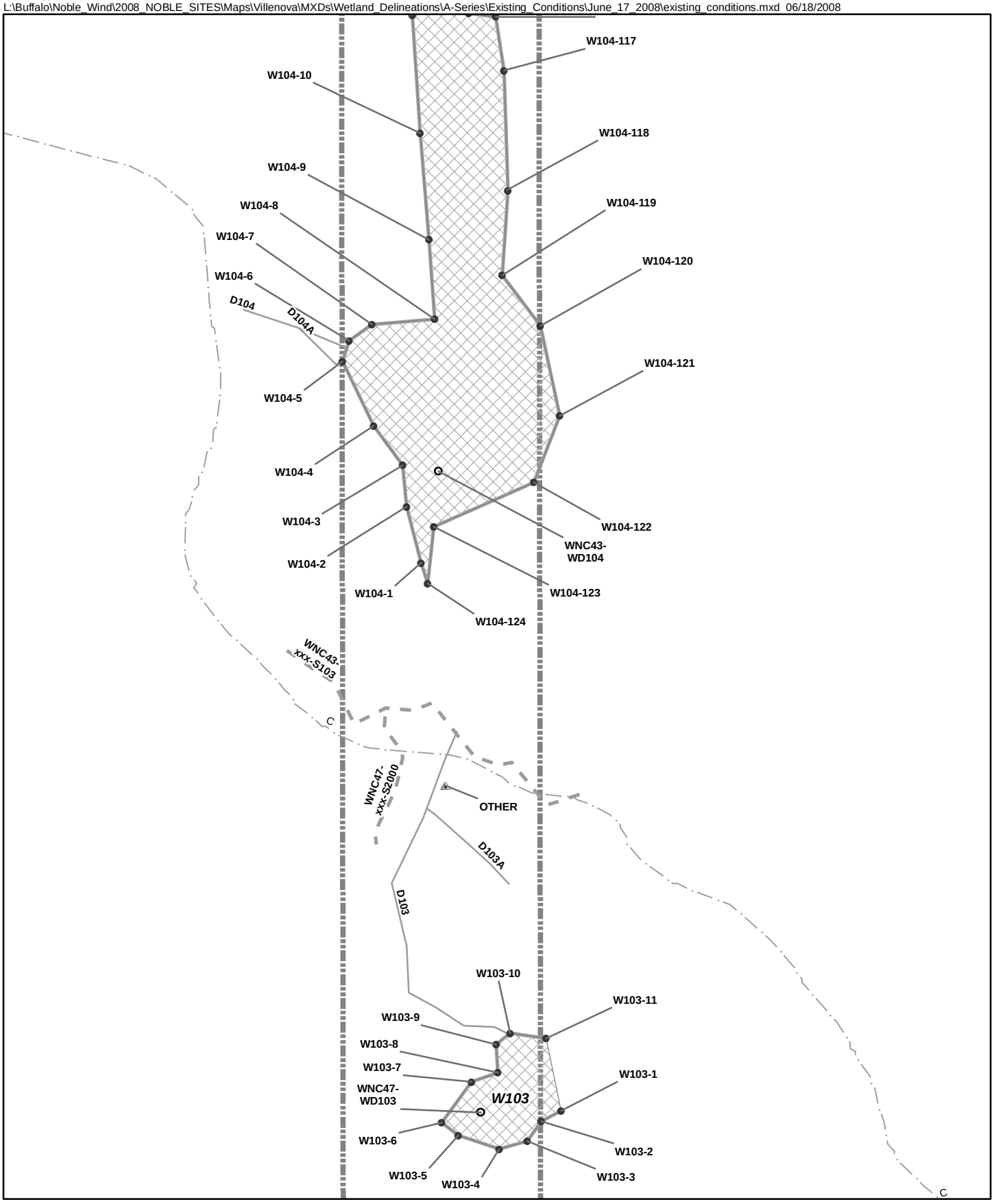
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-6
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

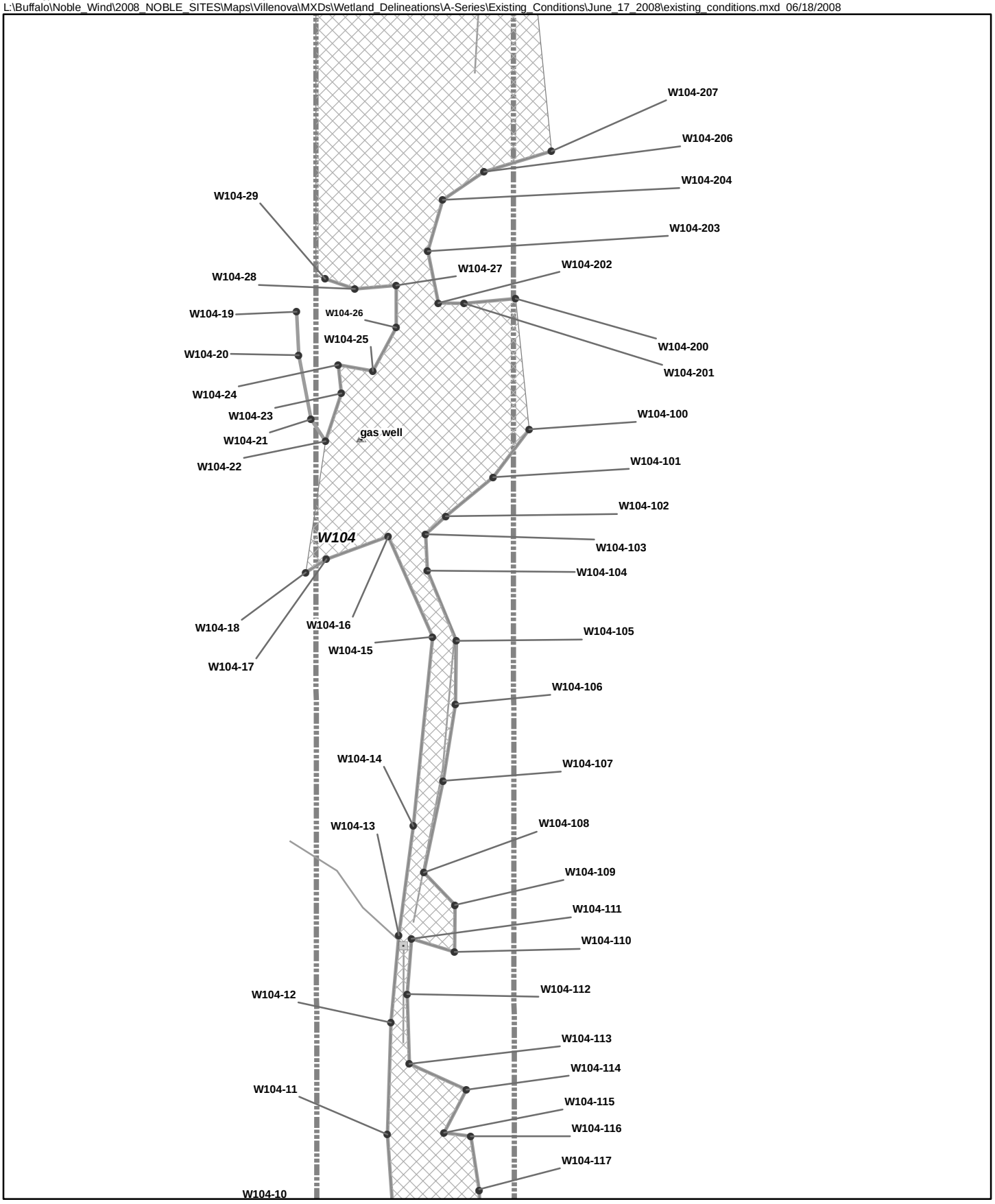
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-7
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S

0 50 100 200
Feet




- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-8
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet

' Ecology & Environment, Inc. GIS Department Project #002270.NP32.02
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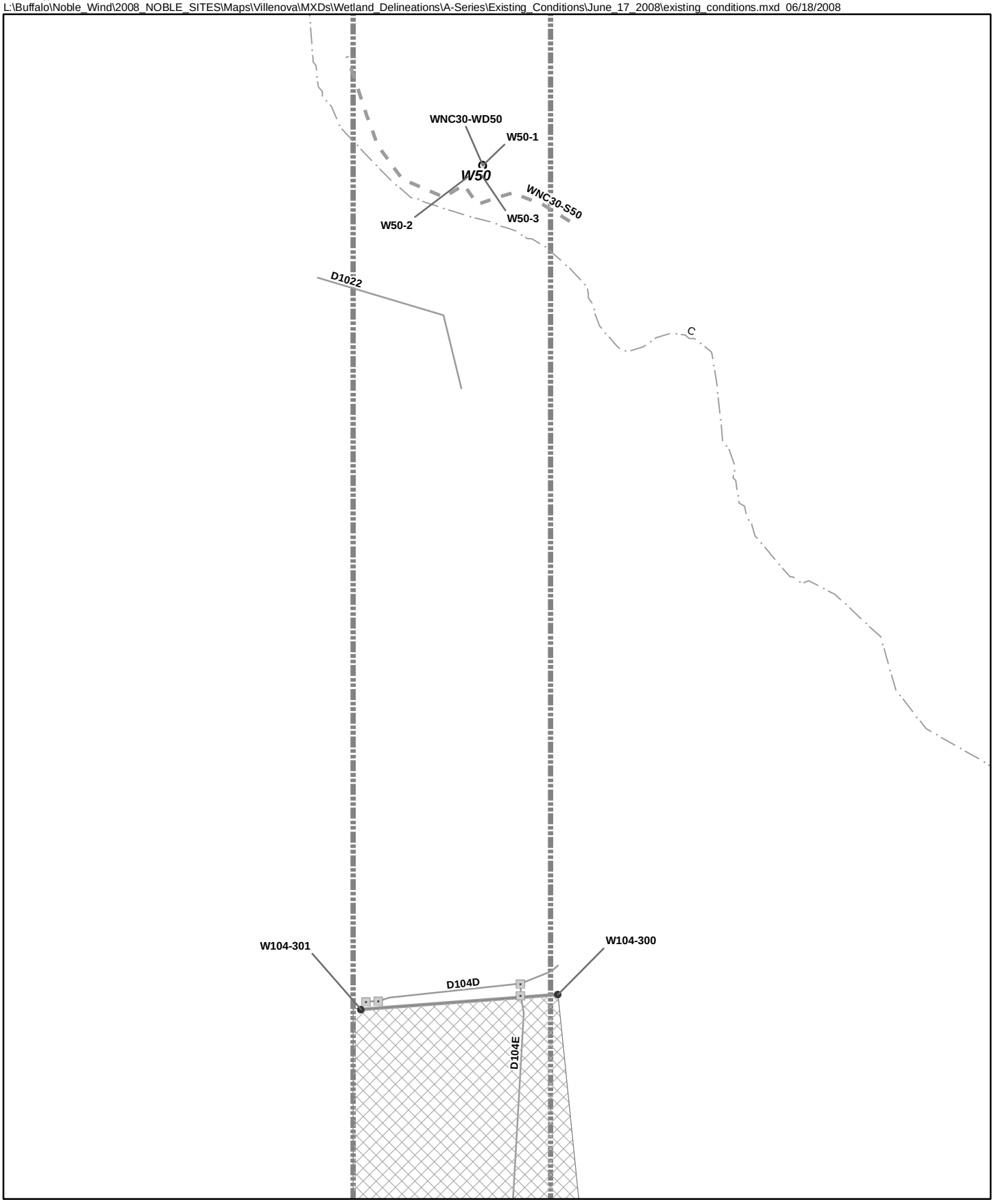



Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

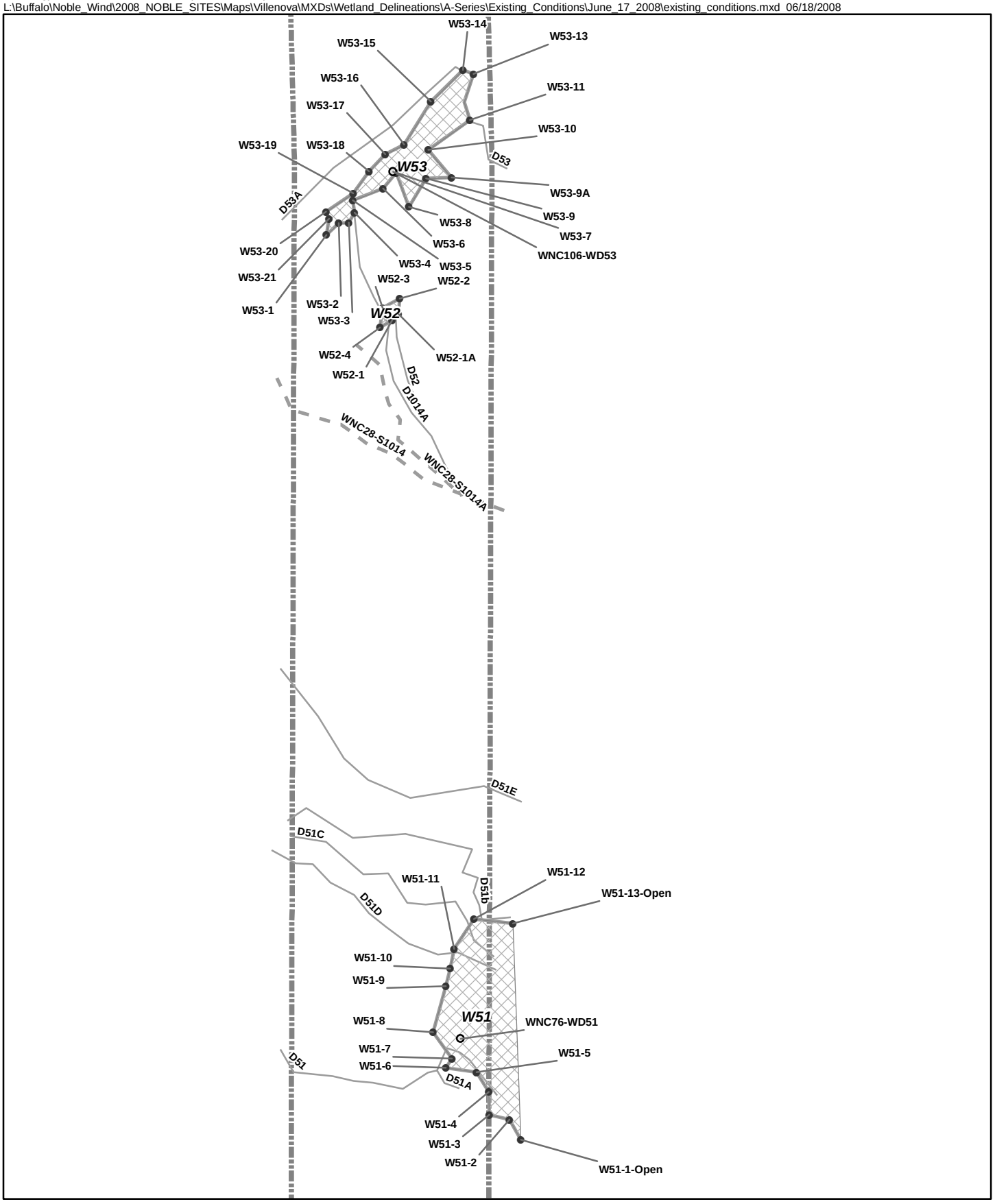
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-9
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet



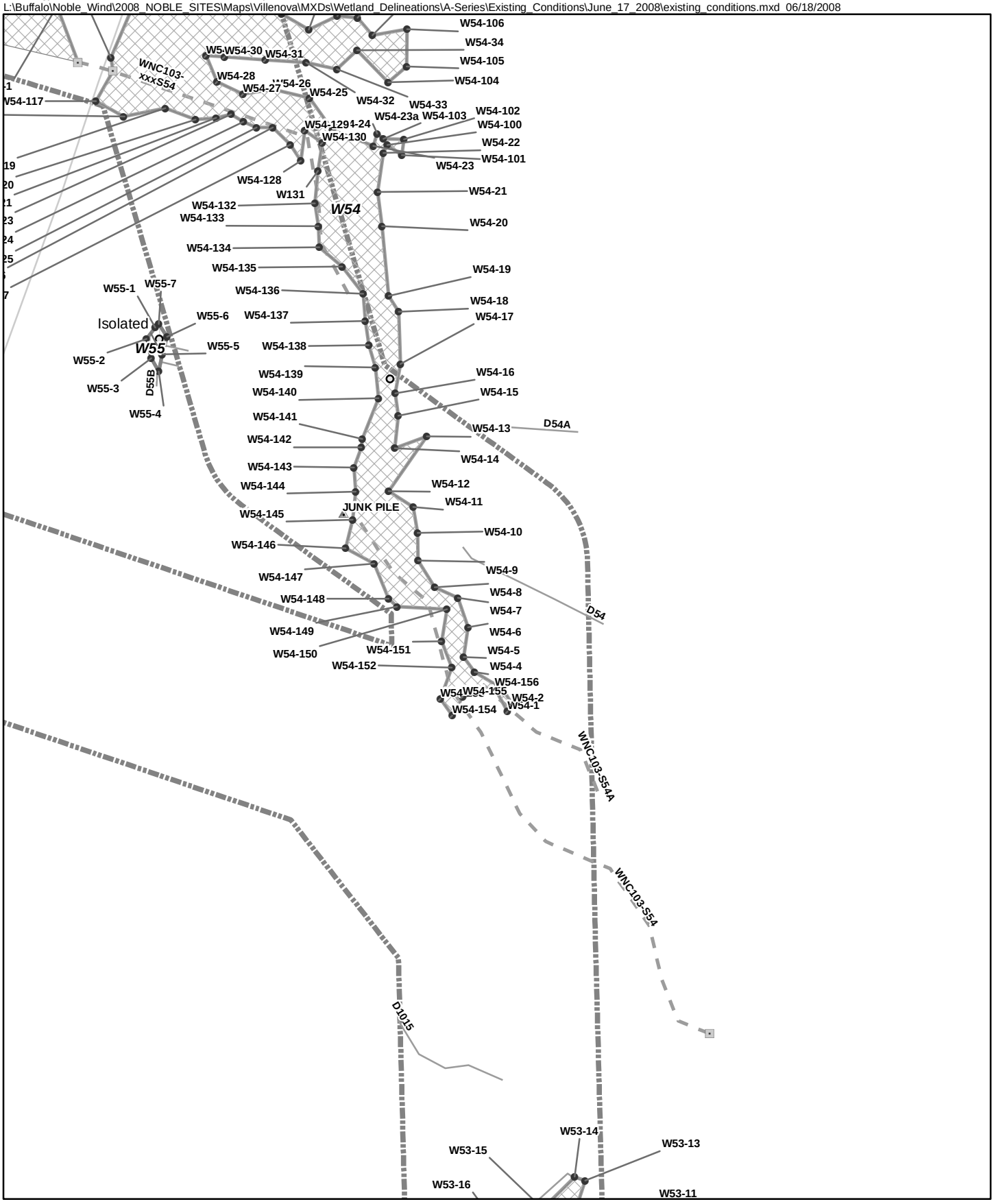

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-10
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-11
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet

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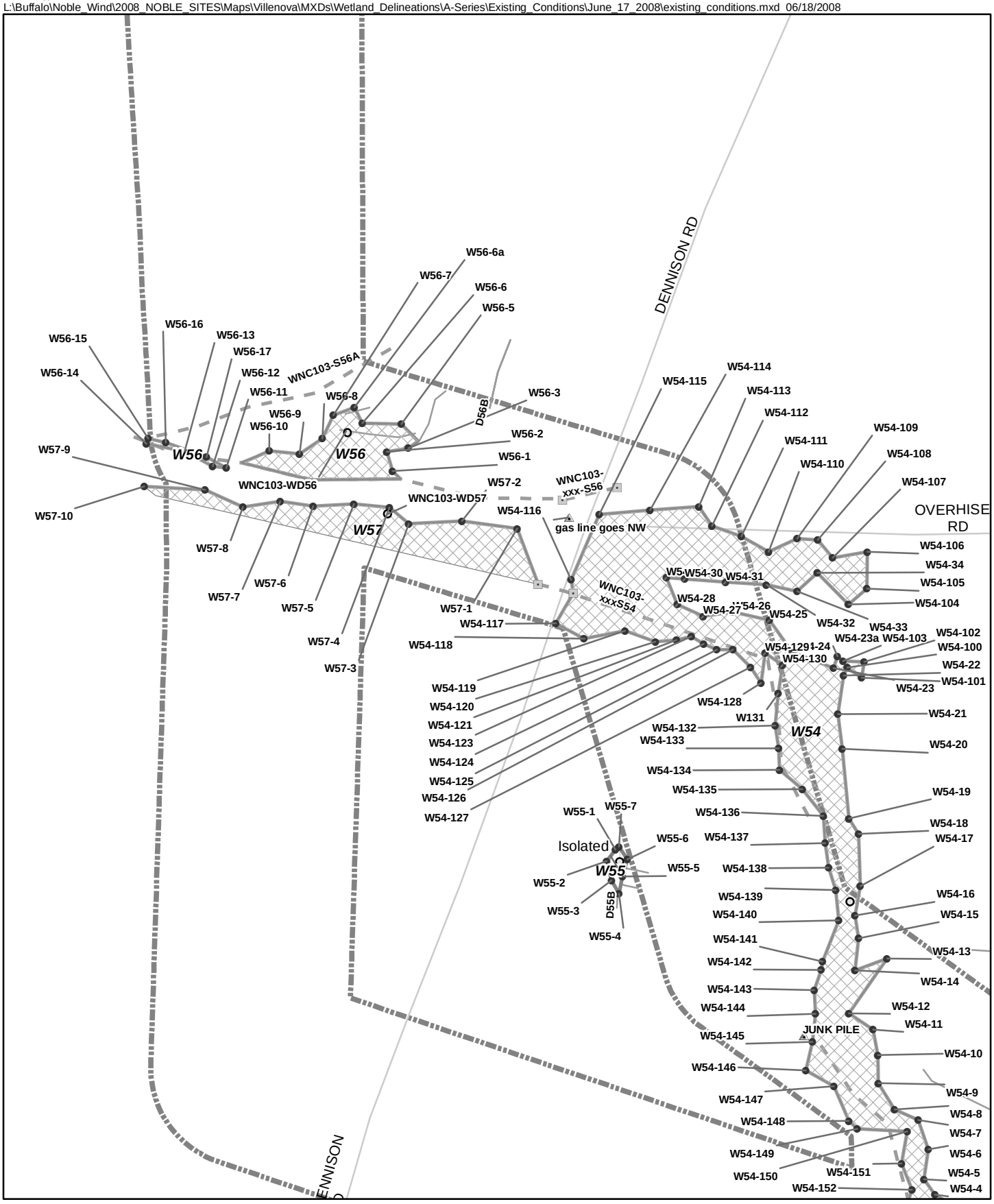


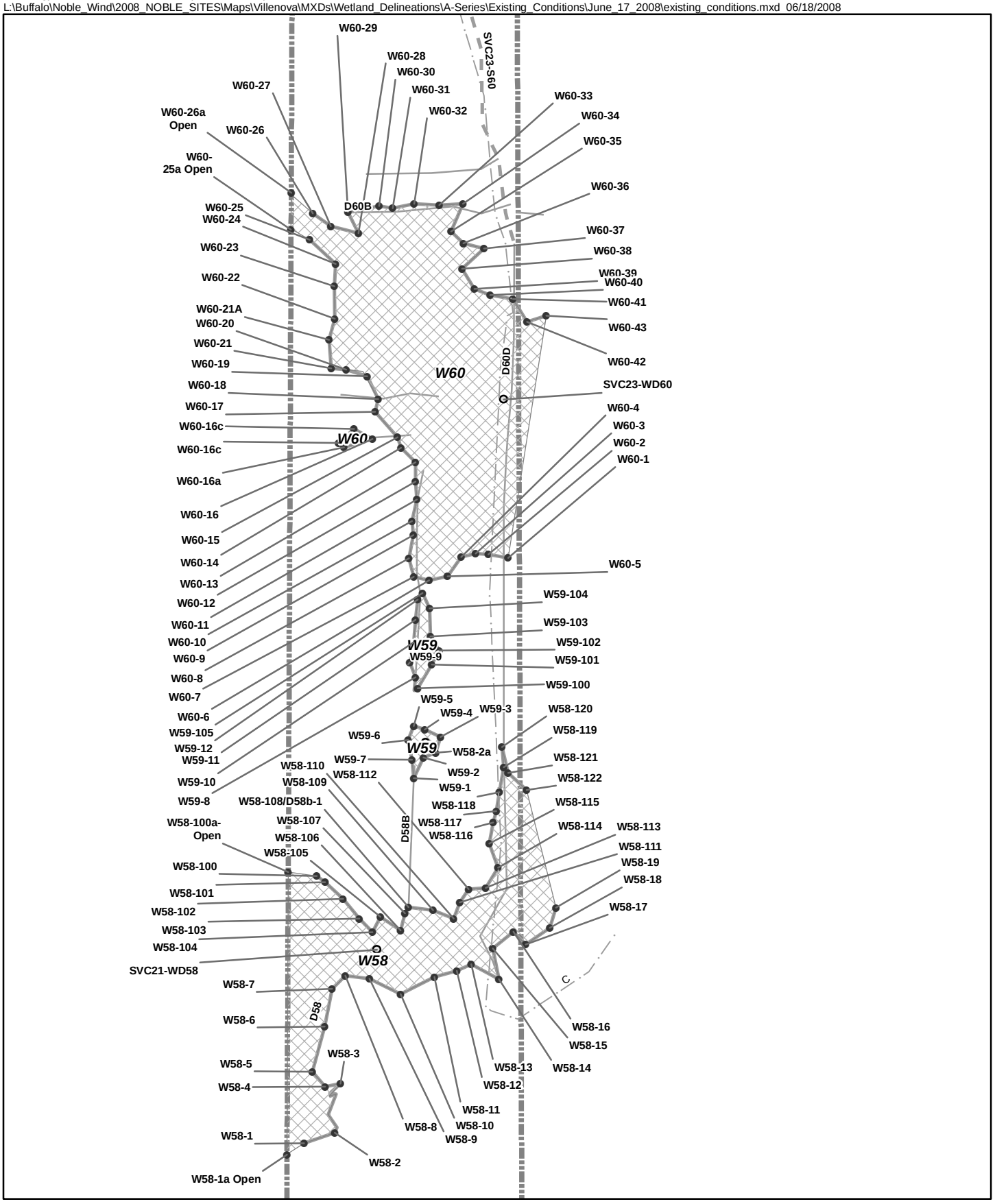

Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-12
Ball Hill Windpark
Field Delineated Wetlands

N
W
E
S
0 50 100 200
Feet



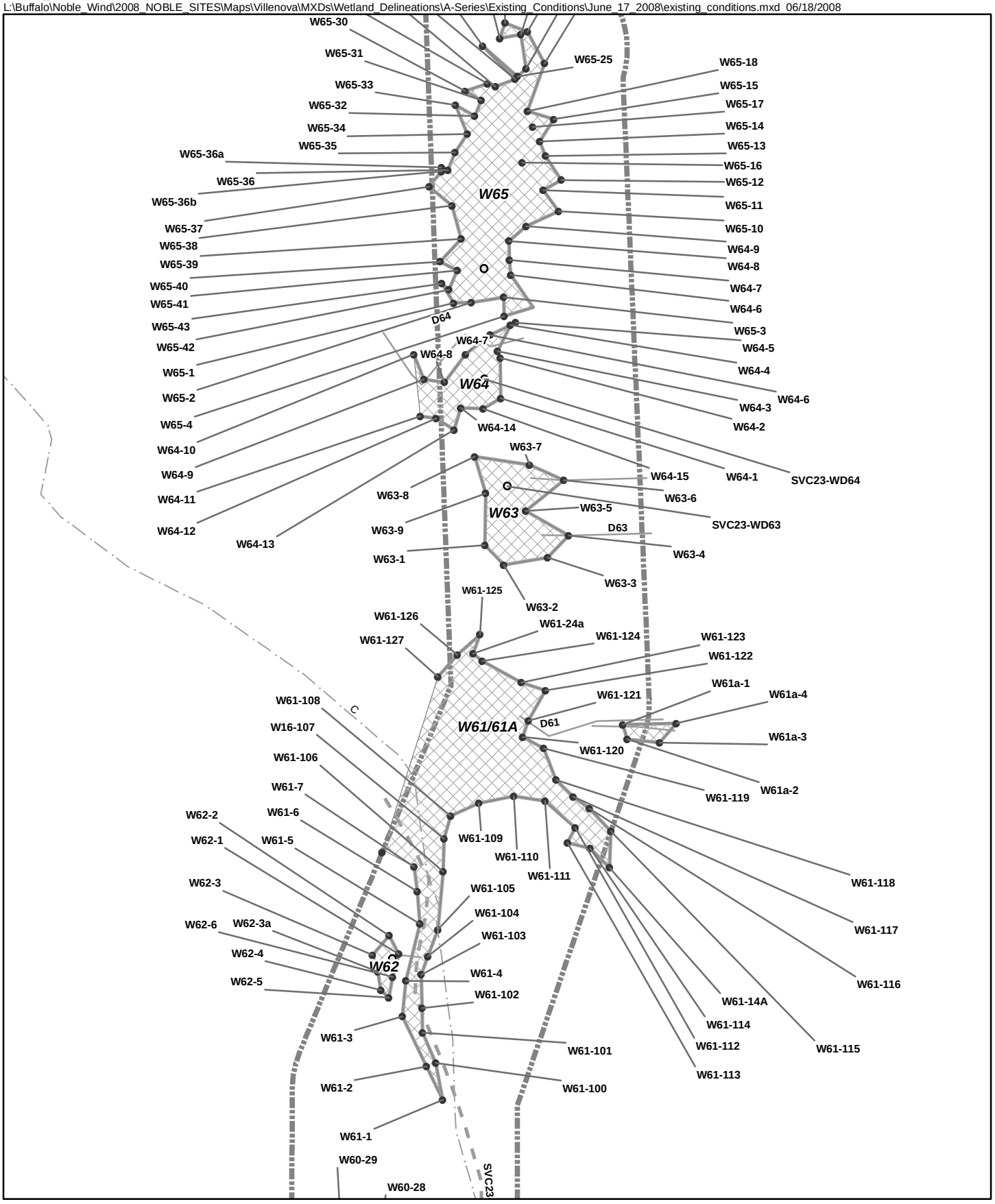

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-13
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet



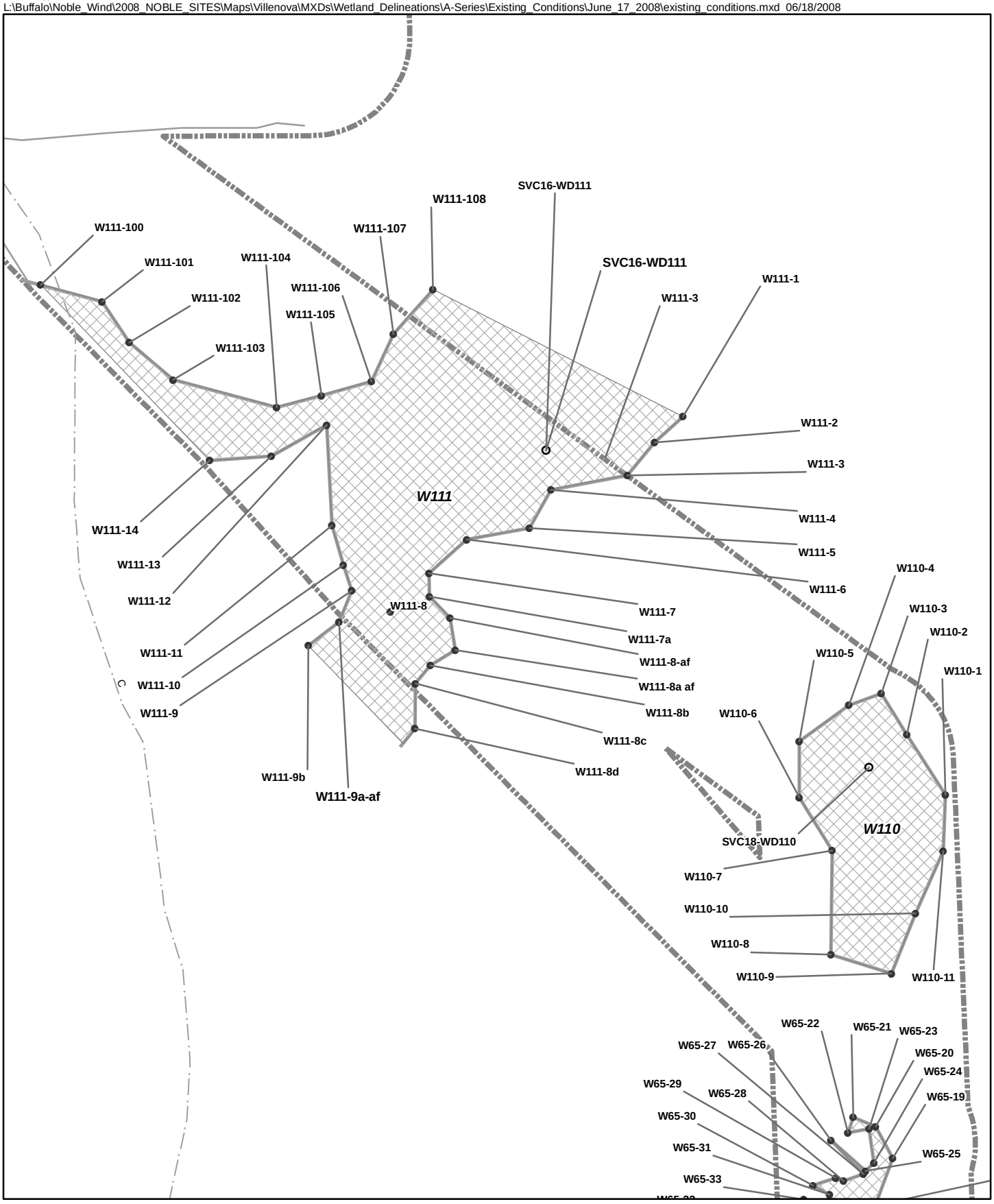

- Turbine (06-10-2008)
- Culvert Point
- Other Point
- Wetland Datasheet
- Wetland Flag
- Drain
- Field Delineated Stream
- Field Delineated Wetland Line
- Field Delineated Pond
- Field Delineated Federally Jurisdictional Wetland
- Field Isolated Wetland
- Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)

Frame F-14
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

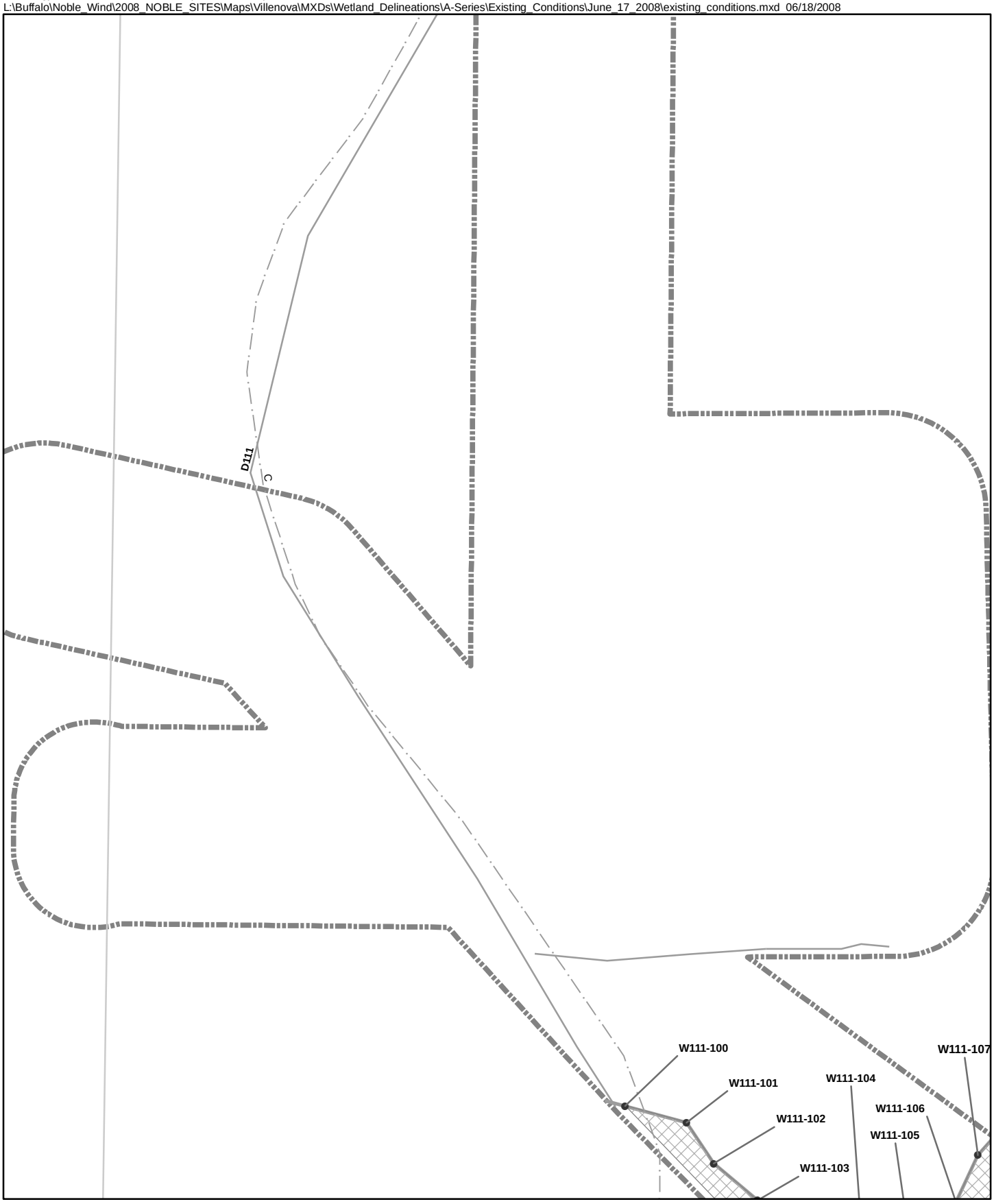
Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-15
Ball Hill Windpark
Field Delineated Wetlands

N
W E
S

0 50 100 200
Feet




Turbine (06-10-2008)
Culvert Point
Other Point
Wetland Datasheet
Wetland Flag

Drain
Field Delineated Stream
Field Delineated Wetland Line
Field Delineated Pond
Field Delineated Federally Jurisdictional Wetland
Field Isolated Wetland
Limit of Jurisdictional Determination (E&E, 08-16-08)

NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

Frame F-16
Ball Hill Windpark
Field Delineated Wetlands

N W E S

0 50 100 200 Feet

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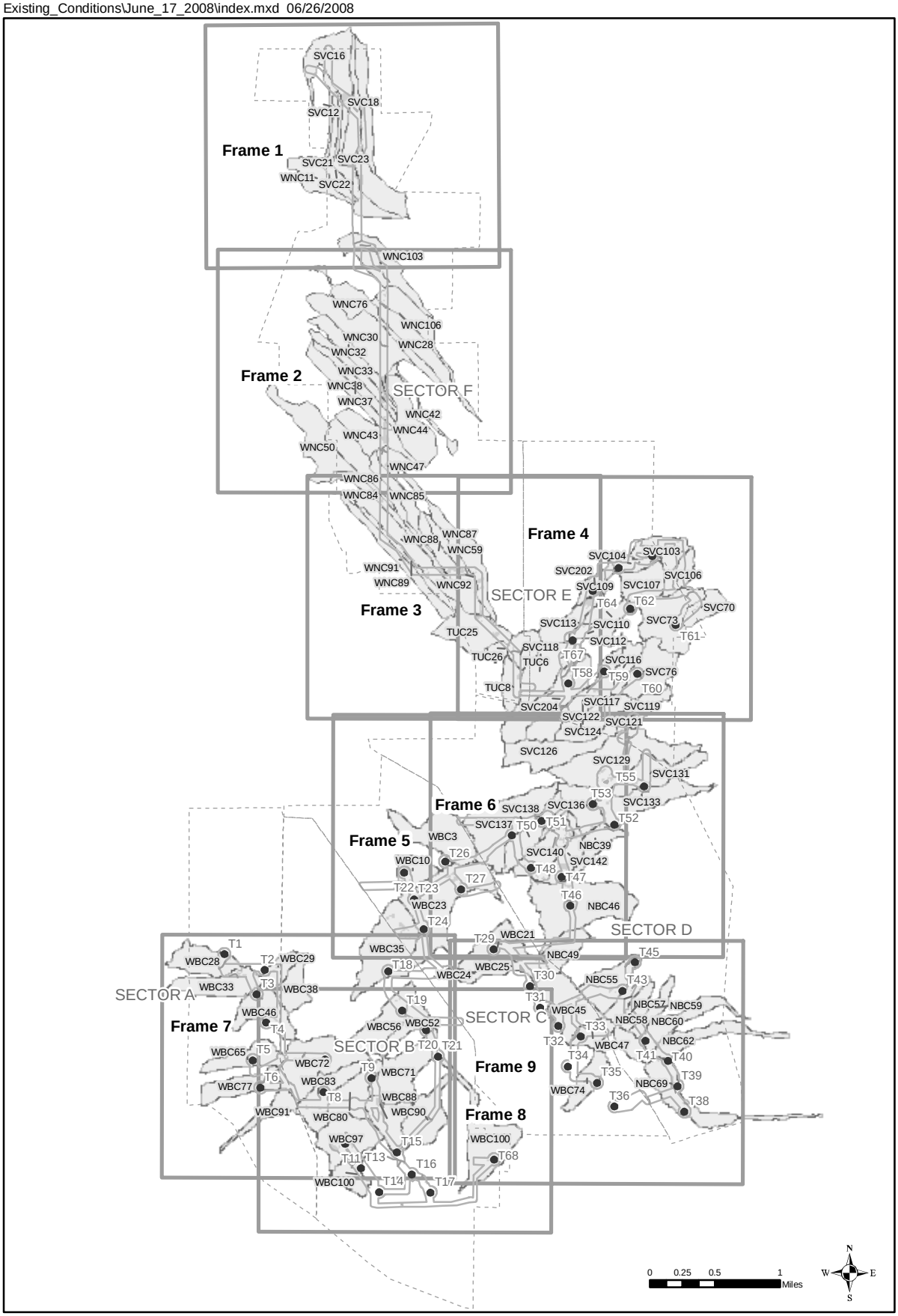
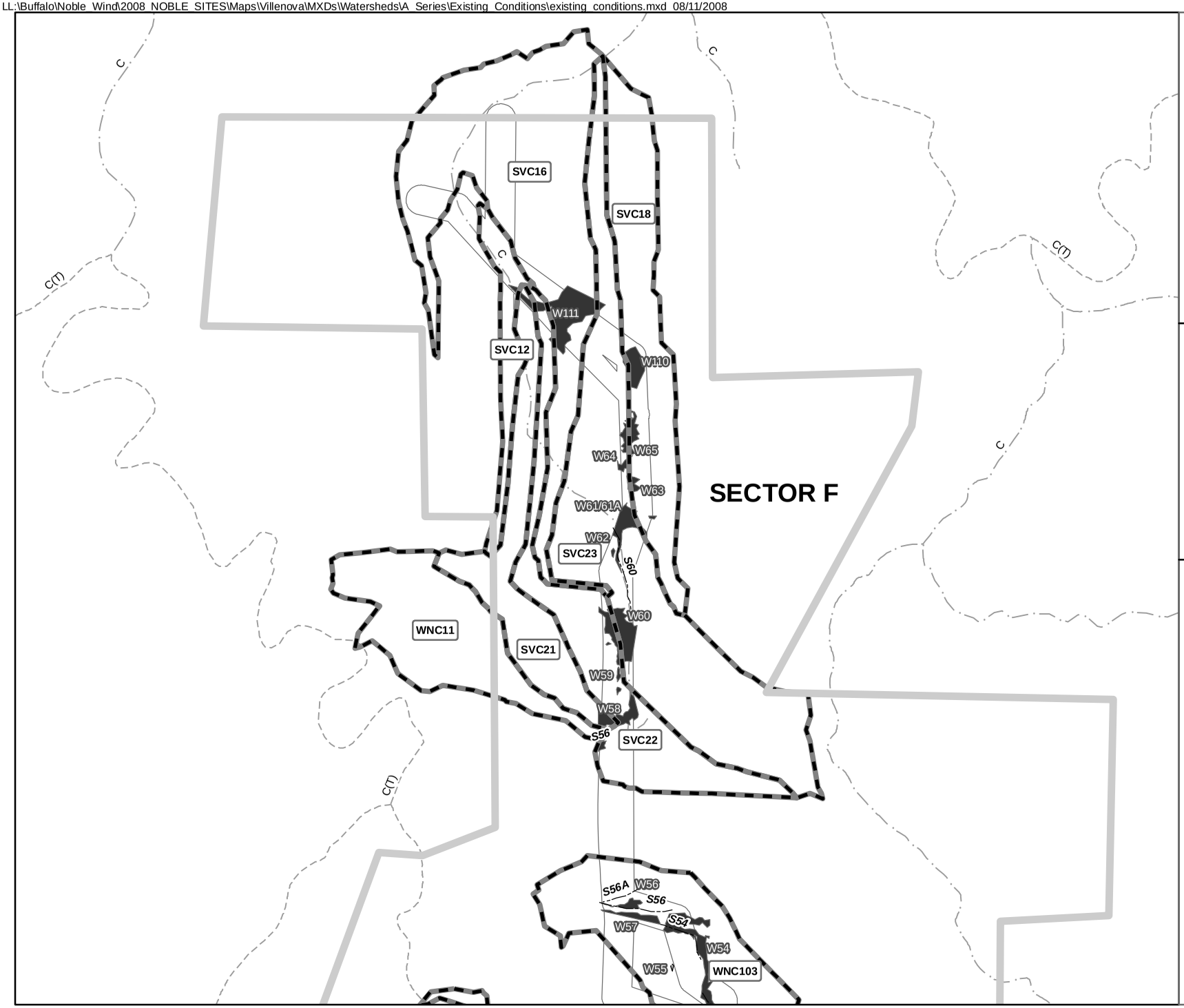
Existing_Conditions\June_17_2008\index.mxd 06/26/2008




- Turbine (06-10-2008)
- Field Delineated Stream
- Limit of Jurisdictional Determination (E&E, 08-16-08)
- Map Index
- Watershed
- Wetland
- Sector

Ball Hill Windfarm
Watershed Mapping
August 18, 2008




Ball Hill Windpark Watershed Mapping

Frame 1

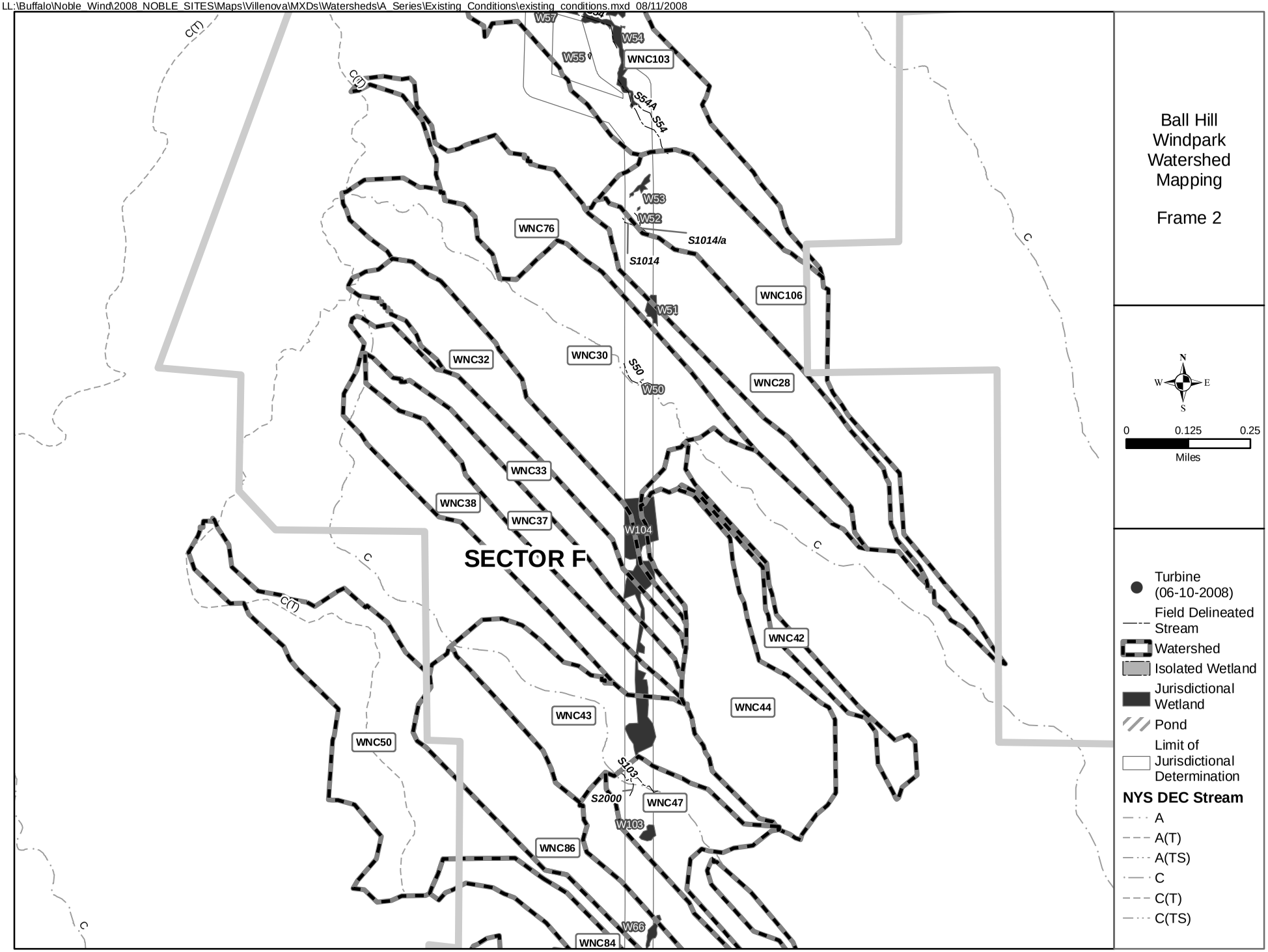
N
W E
S

0 0.125 0.25
Miles

- Turbine (06-10-2008)
- Field Delineated Stream
- Watershed
- Isolated Wetland
- Jurisdictional Wetland
- Pond
- Limit of Jurisdictional Determination

**NYS DEC Stream**

- A
- A(T)
- A(TS)
- C
- C(T)
- C(TS)


W57
W54
W55
WNC103
S54A
S54
W53
W52
WNC76
S1014/a
S1014
WNC106
W51
WNC32
WNC30
S50
W50
WNC28
WNC33
WNC38
WNC37
W104
SECTOR F
WNC42
WNC43
WNC44
WNC50
S103
S2000
WNC47
W103
WNC86
W66
WNC84
C(T)
C
Ball Hill Windpark Watershed Mapping
Frame 2
N
W
E
S
0
0.125
0.25
Miles
Turbine (06-10-2008)
Field Delineated Stream
Watershed
Isolated Wetland
Jurisdictional Wetland
Pond
Limit of Jurisdictional Determination
NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)

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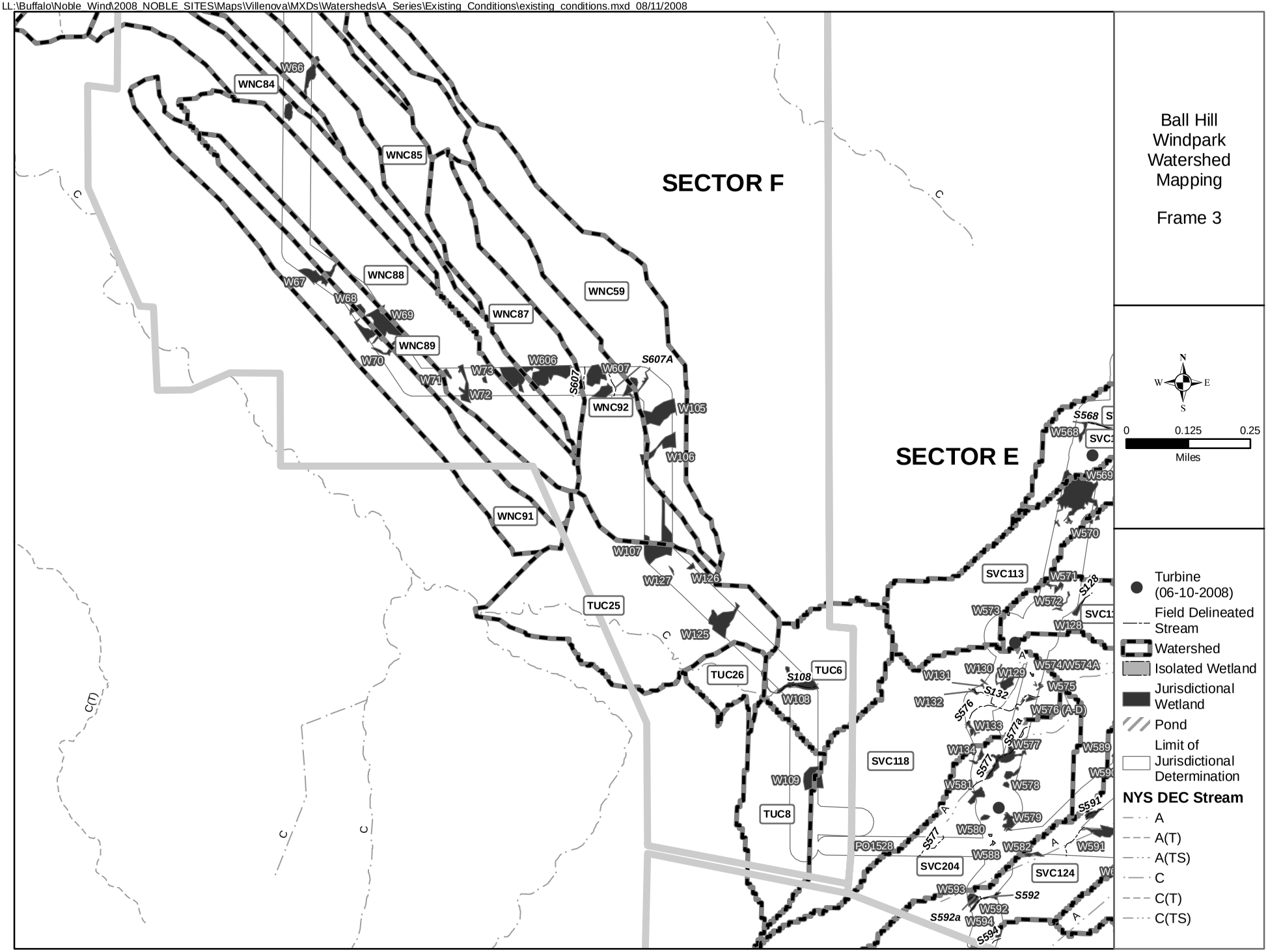

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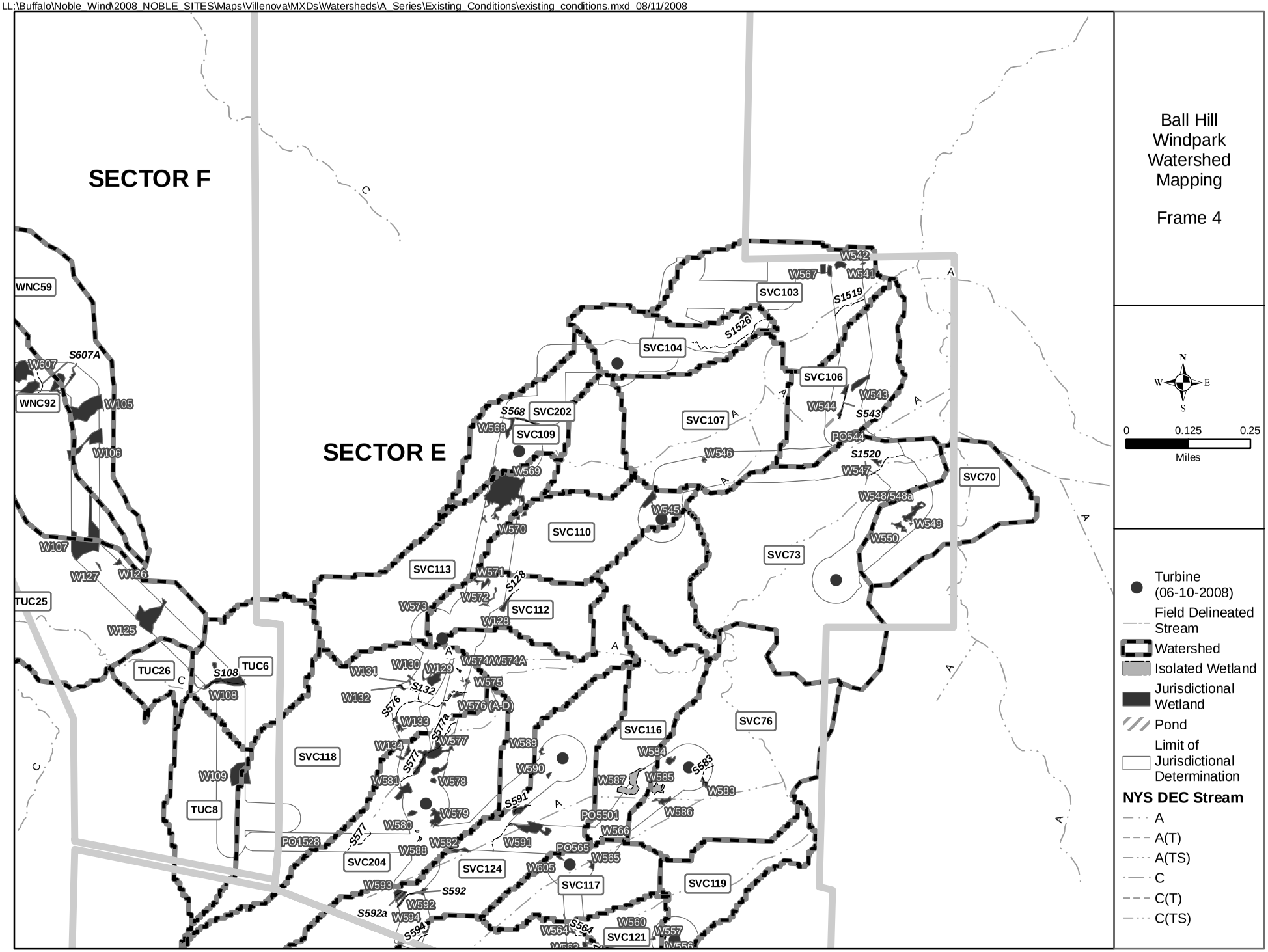

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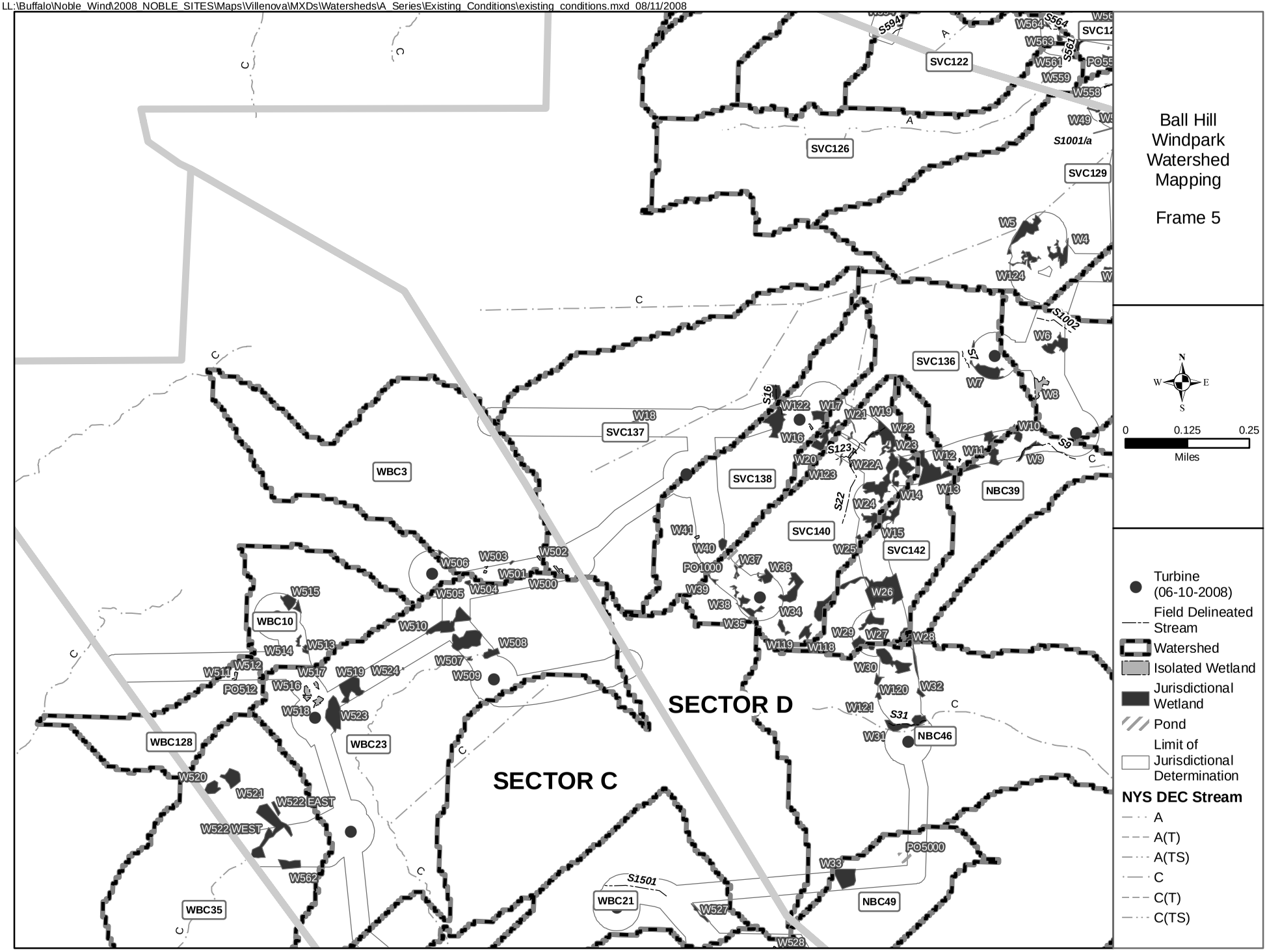

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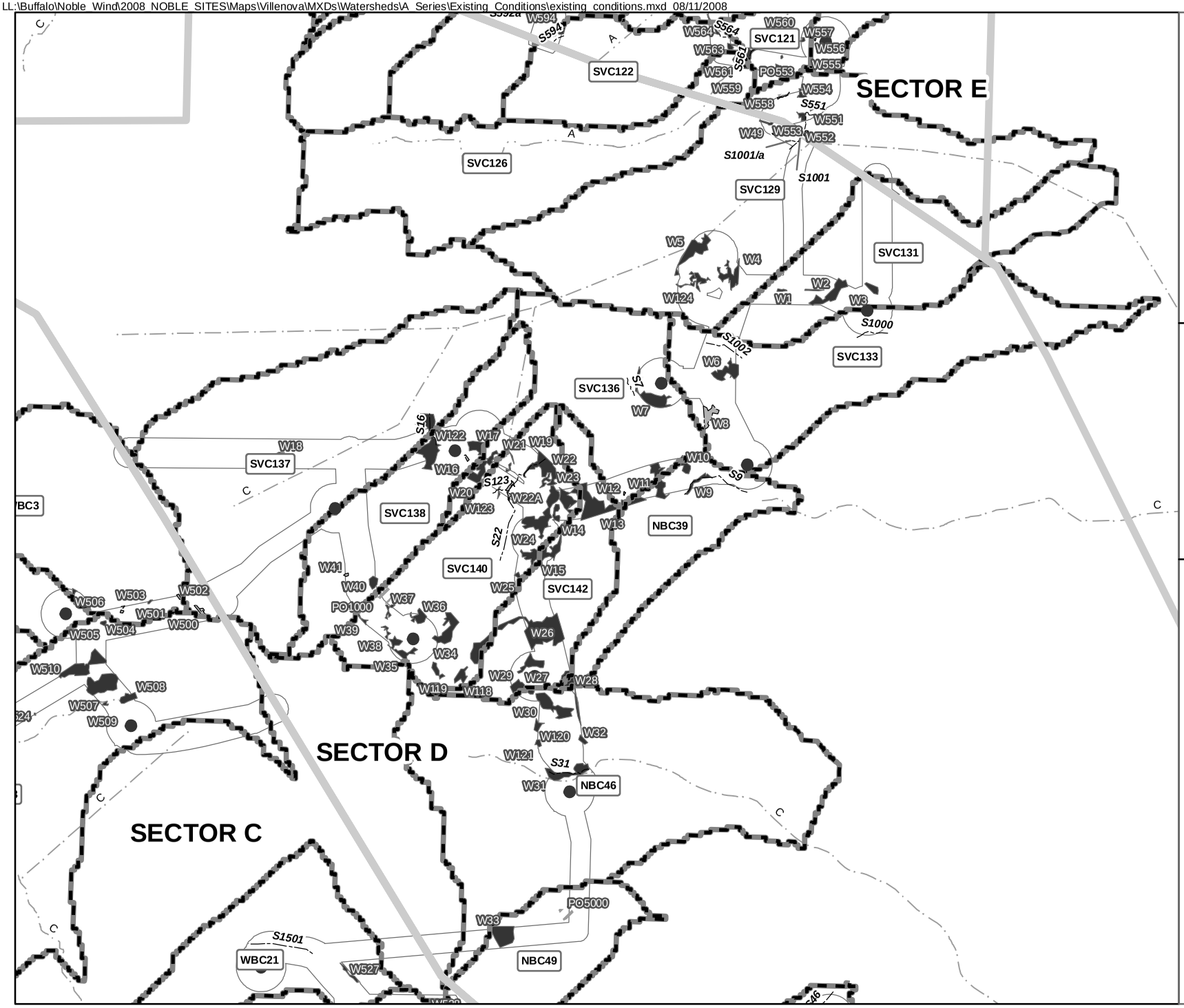
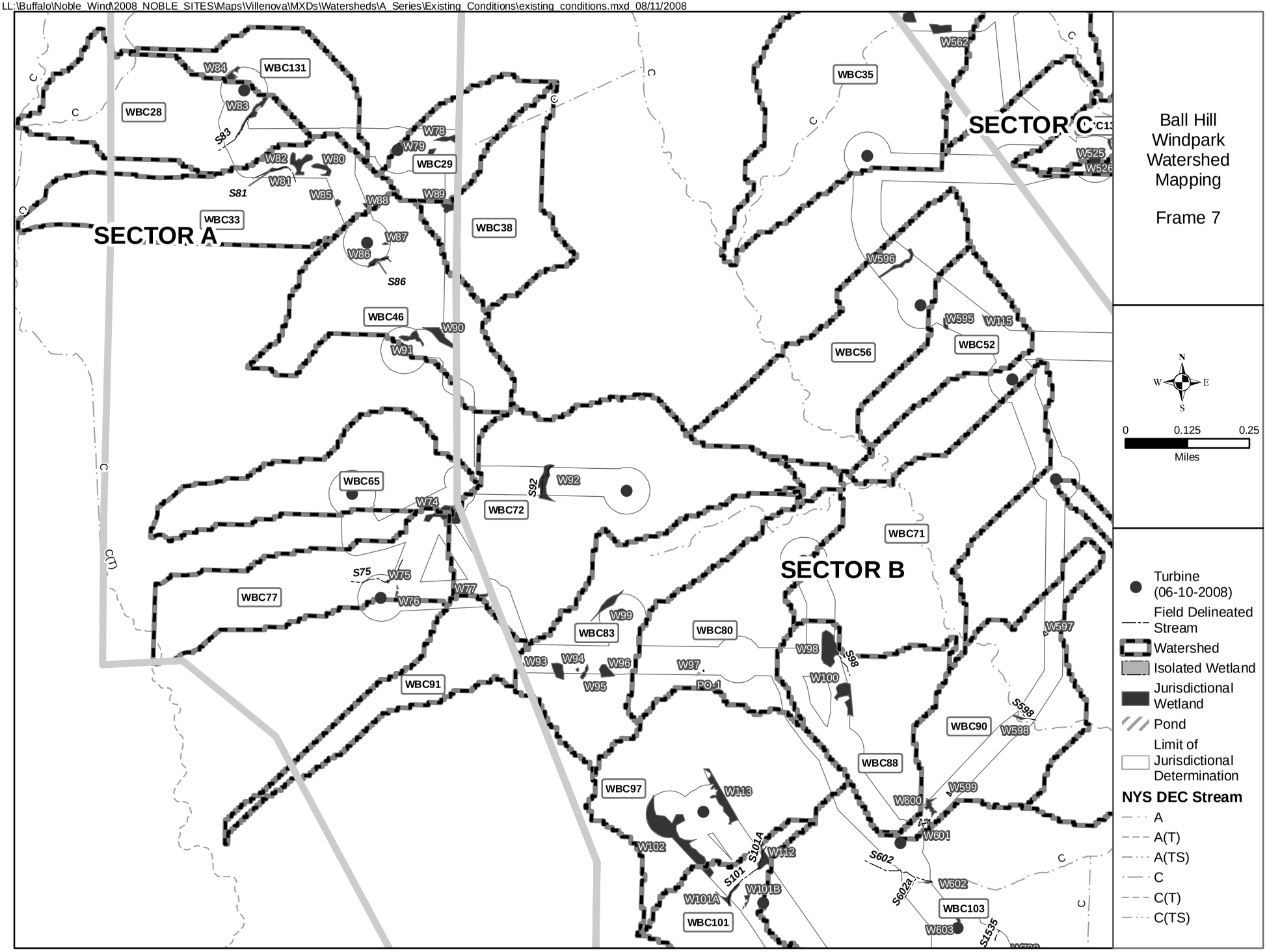
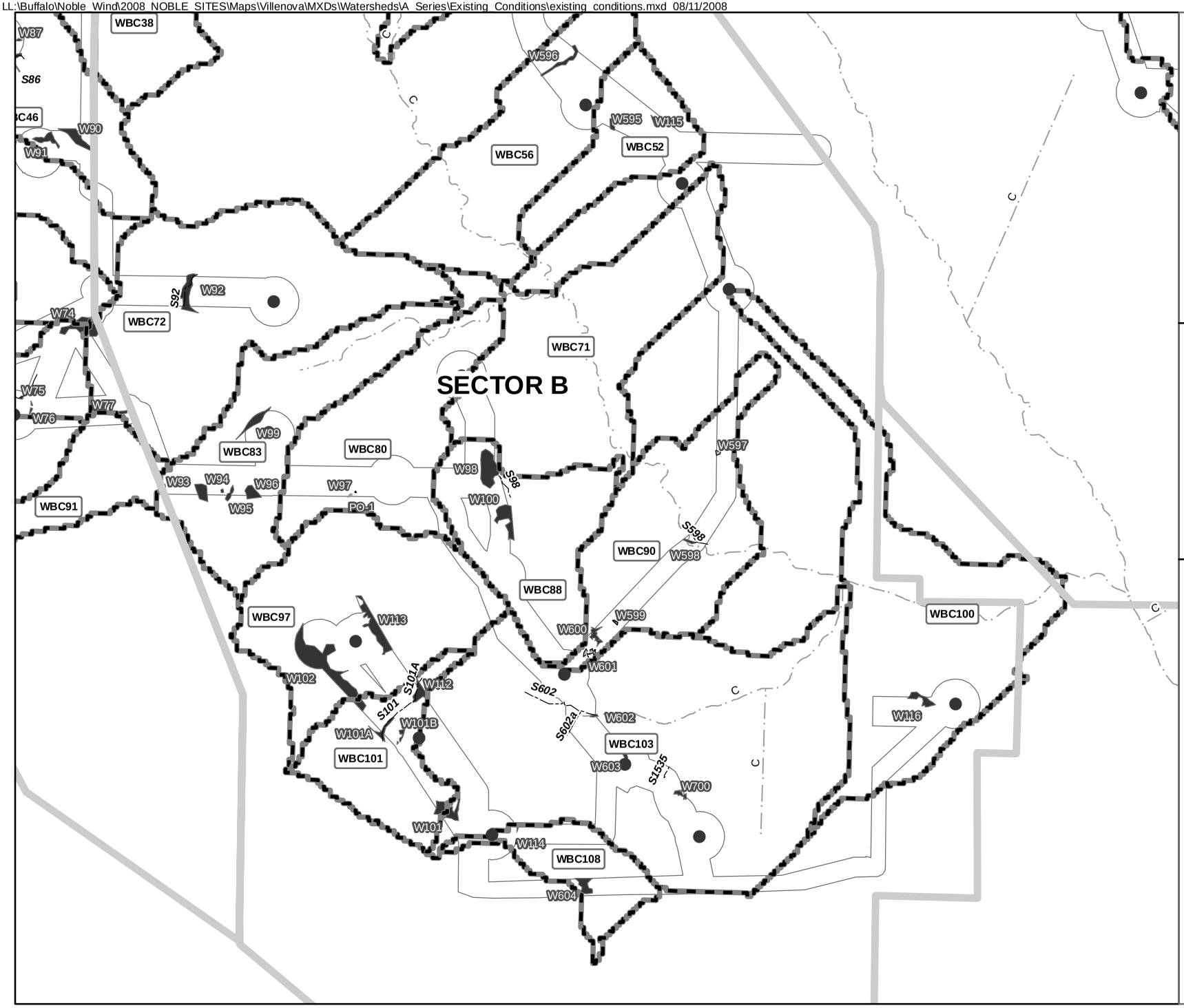



SECTOR A
SECTOR B
SECTOR C
WBC131
WBC28
WBC33
WBC29
WBC38
WBC46
WBC65
WBC72
WBC77
WBC91
WBC83
WBC80
WBC71
WBC35
WBC56
WBC52
WBC90
WBC88
WBC97
WBC101
WBC103
W84
W83
S83
W82
W80
W81
S81
W78
W79
W85
W88
W89
W87
W86
S86
W90
W91
W92
S92
W74
S75
W75
W76
W77
W99
W93
W94
W96
W97
W95
PO-1
W98
S98
W100
W562
W525
W526
W596
W595
W115
W597
S598
W598
W599
W600
W601
W602
W603
W113
W102
S101A
W112
S101
W101B
W101A
S602
S602a
S1535
Ball Hill Windpark Watershed Mapping
Frame 7
N
W
E
S
0
0.125
0.25
Miles
Turbine (06-10-2008)
Field Delineated Stream
Watershed
Isolated Wetland
Jurisdictional Wetland
Pond
Limit of Jurisdictional Determination
NYS DEC Stream
A
A(T)
A(TS)
C
C(T)
C(TS)


WBC38
W87
S86
W596
W595
W115
WBC46
W90
W91
WBC56
WBC52
W92
S92
W74
WBC72
WBC71
SECTOR B
W75
W77
W76
W99
WBC83
WBC80
W597
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W93
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WBC91
W95
PO-1
S599
WBC90
W598
WBC88
WBC97
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W599
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WBC100
W102
W601
S101A
W112
S602
S101
W602
W116
W101A
W101B
S602a
WBC103
WBC101
W603
S1535
W700
W101
W114
WBC108
W604
C
Ball Hill Windpark Watershed Mapping
Frame 8
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E
S
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0.125
0.25
Miles
Turbine (06-10-2008)
Field Delineated Stream
Watershed
Isolated Wetland
Jurisdictional Wetland
Pond
Limit of Jurisdictional Determination
NYS DEC Stream
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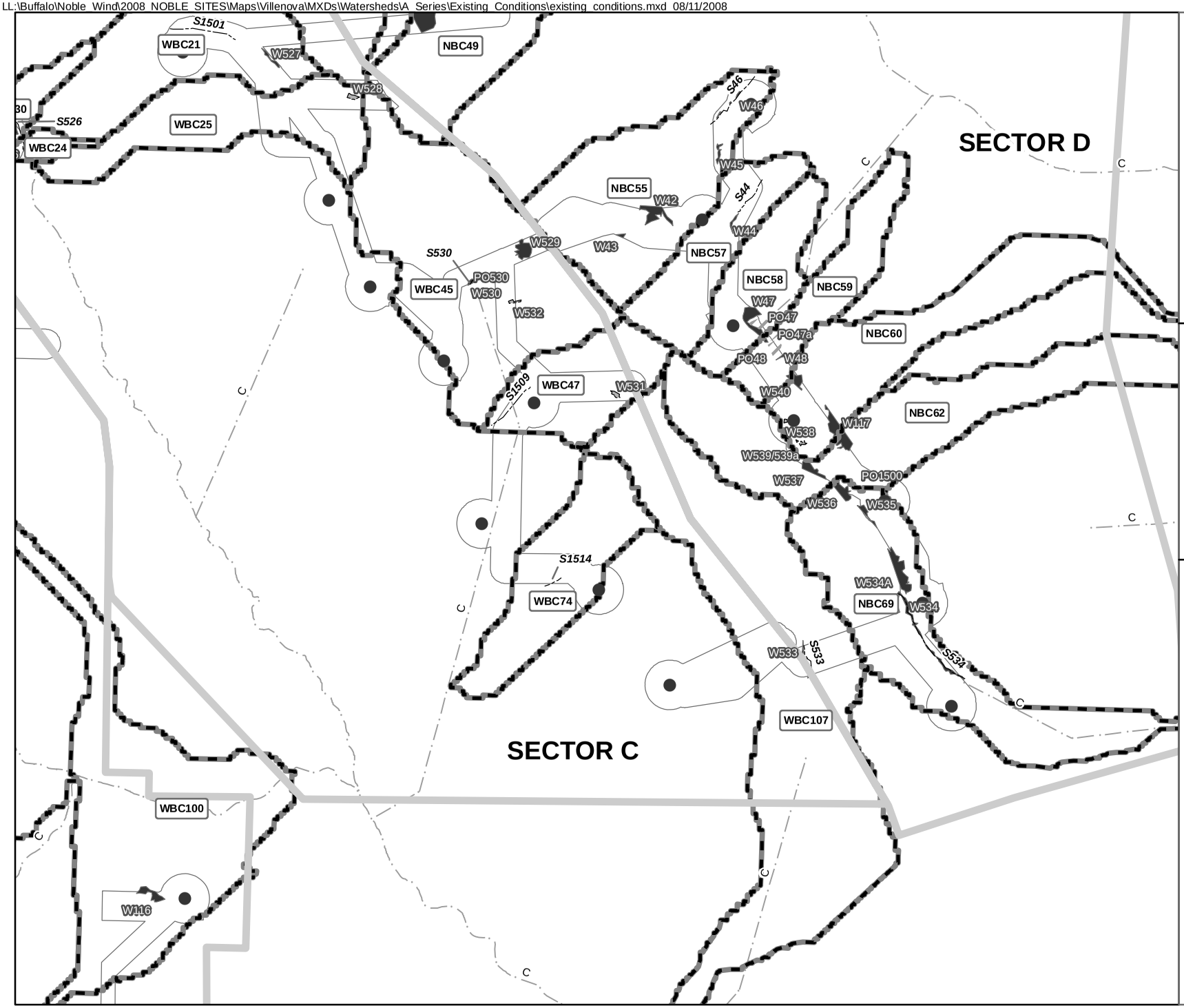


Ball Hill Windpark Watershed Mapping

Frame 9

N
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0 0.125 0.25
Miles

- Turbine (06-10-2008)
- Field Delineated Stream
- Watershed
- Isolated Wetland
- Jurisdictional Wetland
- Pond
- Limit of Jurisdictional Determination

**NYS DEC Stream**

- A
- A(T)
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- C
- C(T)
- C(TS)

DATA LAYER SOURCES:
Turbine - Provided by Noble Environmental Inc.
Access Road - Provided by Noble Environmental Inc.
Underground/Overhead Collection Line - Provided by Noble Environmental Inc.
Survey Corridor - Created by Ecology and Environment Inc.
Sector Boundary - Provided by Noble Environmental Inc
Wetland / Stream Field Delineated Features - created by Ecology and Environment Inc., Spring 2008.
Topographic Contour Lines - Provided by Noble Environmental, Inc.
LIDAR Aerial Photographs - Provided by Noble Environmental, Inc.

CLUSTER 1
CLUSTER 2
CLUSTER 3
CLUSTER 4
CLUSTER 5
CLUSTER 6
CLUSTER 7
CLUSTER 8
CLUSTER 9
CLUSTER 10
CLUSTER 11
CLUSTER 12
CLUSTER 13
CLUSTER 14
CLUSTER 15
CLUSTER 16
CLUSTER 22

A
B
C
D

Ball Hill Wetlands
SectorA-B

- Photo Location
- Turbine (06-10-08)
- Transmission Line (07-10-08)
- 16-Ft Permanent Access Road ROW (07-23-2008)
- 36-Ft Temporary Road (07-23-2008)
- Turbine Staging Area (07-10-08)
- Turbine Crane Pad (07-08-08)
- Overhead Collection (07-10-08)
- Underground Collection (07-10-08)
- Limit of Jurisdictional Determination (08-16-08)
- Switchyard/Substation
- Field Delineated Drain
- Field Delineated Pond
- Field Delineated Stream
- Field Delineated Wetland
- 10' Contour Line
- Field Delineated Isolated Wetland
- Field Delineated Jurisdictional Wetland
- Field Delineated Pond
- NYS DEC Wetland
- Sector Boundary
- Watershed Boundary
- Project Boundary (07-03-2008)

N

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CLUSTER 1
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CLUSTER 17
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CLUSTER 21
CLUSTER 22
CLUSTER 23

A
B
C
D

Ball Hill Wetlands
Sector C

- Photo Location
- Turbine (06-10-08)
- Transmission Line (07-10-08)
- 16-Ft Permanent Access Road ROW (07-23-2008)
- 36-Ft Temporary Road (07-23-2008)
- Turbine Staging Area (07-10-08)
- Turbine Crane Pad (07-08-08)
- Overhead Collection (07-10-08)
- Underground Collection (07-10-08)
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- 10' Contour Line
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- Field Delineated Pond
- NYS DEC Wetland
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- Watershed Boundary
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Ball Hill Wetlands
Sector D

- Photo Location
- Turbine (06-10-08)
- Transmission Line (07-10-08)
- 16-Ft Permanent Access Road ROW (07-23-2008)
- 36-Ft Temporary Road (07-23-2008)
- Turbine Staging Area (07-10-08)
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- Overhead Collection (07-10-08)
- Underground Collection (07-10-08)
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- Field Delineated Wetland
- 10' Contour Line
- Field Delineated Isolated Wetland
- Field Delineated Jurisdictional Wetland
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- NYS DEC Wetland
- Sector Boundary
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N

0 500 1,000 2,000 Feet

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LIDAR Aerial Photographs - Provided by Noble Environmental, Inc.

F

E

CLUSTER 26

CLUSTER 27

CLUSTER 25

CLUSTER 24

CLUSTER 23

Ball Hill Wetlands
Sector E

- Photo Location
- Turbine (06-10-08)
- Transmission Line (07-10-08)
- 16-Ft Permanent Access Road ROW (07-23-2008)
- 36-Ft Temporary Road (07-23-2008)
- Turbine Staging Area (07-10-08)
- Turbine Crane Pad (07-08-08)
- Overhead Collection (07-10-08)
- Underground Collection (07-10-08)
- Limit of Jurisdictional Determination (08-16-08)
- Switchyard/Substation
- Field Delineated Drain
- Field Delineated Pond
- Field Delineated Stream
- Field Delineated Wetland
- 10' Contour Line
- Field Delineated Isolated Wetland
- Field Delineated Jurisdictional Wetland
- Field Delineated Pond
- NYS DEC Wetland
- Sector Boundary
- Watershed Boundary
- Project Boundary (07-03-2008)

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F

E

Ball Hill Wetlands
Sector F1

- Photo Location
- Turbine (06-10-08)
- Transmission Line (07-10-08)
- 16-Ft Permanent Access Road ROW (07-23-2008)
- 36-Ft Temporary Road (07-23-2008)
- Turbine Staging Area (07-10-08)
- Turbine Crane Pad (07-08-08)
- Overhead Collection (07-10-08)
- Underground Collection (07-10-08)
- Limit of Jurisdictional Determination (08-16-08)
- Switchyard/Substation
- Field Delineated Drain
- Field Delineated Pond
- Field Delineated Stream
- Field Delineated Wetland
- 10' Contour Line
- Field Delineated Isolated Wetland
- Field Delineated Jurisdictional Wetland
- Field Delineated Pond
- NYS DEC Wetland
- Sector Boundary
- Watershed Boundary
- Project Boundary (07-03-2008)

N

0 500 1,000 2,000 Feet

DRAFT

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F

E

D

CLUSTER 26

CLUSTER 25

Ball Hill Wetlands
Sector F2

- Photo Location
- Turbine (06-10-08)
- Transmission Line (07-10-08)
- 16-Ft Permanent Access Road ROW (07-23-2008)
- 36-Ft Temporary Road (07-23-2008)
- Turbine Staging Area (07-10-08)
- Turbine Crane Pad (07-08-08)
- Overhead Collection (07-10-08)
- Underground Collection (07-10-08)
- Limit of Jurisdictional Determination (08-16-08)
- Switchyard/Substation
- Field Delineated Drain
- Field Delineated Pond
- Field Delineated Stream
- Field Delineated Wetland
- 10' Contour Line
- Field Delineated Isolated Wetland
- Field Delineated Jurisdictional Wetland
- Field Delineated Pond
- NYS DEC Wetland
- Sector Boundary
- Watershed Boundary
- Project Boundary (07-03-2008)

N

0 500 1,000 2,000 Feet

DRAFT

# H Conceptual Wetland Mitigation Plan

# Conceptual Wetland Mitigation Plan
# Noble Ball Hill Windpark
# Towns of Villenova and Hanover
# Chautauqua County, New York

**August 2008**

Prepared for:

**Noble Environmental Power, LLC**

Prepared by:

**Ecology and Environment, Inc.**
368 Pleasant View Drive
Lancaster, New York 14086

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# 1 Introduction

This report provides a conceptual plan to mitigate for permanent impacts to wetlands resulting from construction and operation of the Noble Ball Hill Windpark (the Project) in the Towns of Villenova and Hanover, Chautauqua County, New York. This report has been prepared to support Noble Environmental Power, LLC's (Noble's) Joint Permit Application submitted to United States Army Corps of Engineers (USACE) and the New York State Department of Environmental Conservation (NYSDEC). Ecology and Environment, Inc. (E & E) delineated and evaluated wetlands and waterbodies within the Project site regulated by the USACE under Sections 401 and 404 of the Clean Water Act (CWA) and by NYSDEC under the Article 24 - Freshwater Wetlands Act and Article 15 - Protection of Waters Program. Jurisdictional wetland determinations will be confirmed by the USACE and NYSDEC in the fall of 2008 or spring of 2009. Specific details of the wetland delineation are provided in Appendix G of the Draft Environmental Impact Statement (DEIS) prepared for the Project.

This document provides background information on existing conditions in the Project Area and the concepts that will be applied to the design of a final mitigation plan. Noble has developed this mitigation plan as a conceptual document to demonstrate the adequacy of suitable wetland mitigation opportunities in the Project Area to offset potential Project impacts. Noble will develop a final mitigation plan in consultation with the USACE and NYSDEC prior to the Project implementation.

## 1.1 Description of the Proposed Action

Noble is proposing to construct and operate a wind energy facility in the Towns of Villenova and Hanover (see Figure 1.1-1 of the DEIS). The Project consists of generation and transmission components (see Figure 1.1-2 of the DEIS).

More specifically, the Project will include the following:

- Installation and operation of 60 wind turbines (49 in the Town of Villenova and 11 in the Town of Hanover) with a capacity of 90.0 megawatts (MW) within an approximate 13,658-acre Project Area in the Towns of Villenova and Hanover.

- Construction and use of approximately 16 miles of access roads (13 miles in the Town of Villenova and 3 miles in the Town of Hanover) that will connect each wind turbine to a town or county roadway to allow equipment and vehicle access for construction and subsequent maintenance of the facilities as well as emergency services, if needed. After construction, the 35-foot temporary access road will be scaled back to a permanent 16-foot access road, allowing Noble to use the existing roadway for maintenance and operational purposes.

- Construction and use of an electrical collection system that will allow delivery of electricity to a new substation to be constructed in the Town of Hanover. Where practical, the electrical collection system will be installed underground along the same right-of-way (ROW) corridor as the access roads. A total of 23.8 miles of collection lines (including underground collection lines co-located with access roads) will be installed (18.7 miles in the Town of Villenova and 5.1 miles in the Town of Hanover). Approximately 8.5 miles will be installed within new ROWs over private lands between turbines (7.3 miles in the Town of Villenova and 1.2 miles in the Town of Hanover). As currently designed, nearly the entire the collection system will be installed underground. A total of 174 feet (0.03 miles) of overhead collection lines will be installed in the Town of Villenova. No overhead collection line will be required in the Town of Hanover.

- Construction and use of a new substation (Hanover substation) within the Project Area in the Town of Hanover that will tie into a new 115-kilovolt (kV) transmission line. The substation footprint will be approximately 200 by 300 feet. The substation will be located on and have direct access to Hurlbert Road.

- Construction and use of a switchyard within the Project Area in the Town of Hanover. The switchyard footprint will be approximately 300 by 500 feet. The switchyard will be located on and have direct access to Bennett State Road (County Route 85).

- Construction and use of a 6-mile overhead 115 kV transmission line, sited within the Town of Hanover, to transfer the energy from the new substation to the new switchyard. The proposed switchyard will provide a connection to the existing 230 kV National Grid transmission line that provides access to the grid.

# 2 Mitigation Goals and Objectives

Within the regulatory framework, compensatory mitigation can only be considered after the Project proponent demonstrates avoidance and minimization to the extent possible. Following the review and acceptance by agencies regarding the alternatives analysis conducted to demonstrate minimization of impacts, compensatory mitigation must be developed to offset Project-related impacts. With respect to the Noble Ball Hill Windpark, unavoidable permanent wetland impacts will result from a network of interconnecting roads and associated electric connection and transmission lines required to access the Project Area and connect the Windpark to the local electric grid. No turbine locations will result in permanent wetland impacts. Based on USACE guidance and NYSDEC guidance, mitigation can be completed either financially, in the form of in lieu fee mitigation, land acquisition for preservation purposes, regional mitigation banking, or in the form of a specific wetland restoration, creation, or enhancement project developed in conjunction with the proposed Project. Depending on agency input and local availability of existing mitigation opportunities, the mitigation may also take the form of a consolidated mitigation plan, combining several of the available mitigation options.

Impacts from construction of the Project will result in the permanent fill of a total of 0.33 acre of wetland (see Table 2-1). The Project will also result in the permanent conversion of 5.13 acres of forested wetland to shrub/scrub or emergent wetland (see Table 2-4).

### Wetlands under Federal Jurisdiction

Of the total of 0.33 acre of wetland that will be impacted by the permanent placement of fill, 0.32 acre is federally jurisdictional. The Project will also result in the permanent conversion of 5.11 acres of federally jurisdictional forested wetland to shrub/scrub or emergent wetland (see Tables 2-2 and 2-4).

### Wetlands under State Jurisdiction

Several of the federally jurisdictional wetlands impacted are also regulated under New York State wetland regulations. As such, they are dually regulated and the state jurisdictional wetland impacts discussed here are a subset of the federally jurisdictional wetlands and do not represent additional wetland impacts. Construction of the Project will not result in any permanent fill impacts to wetlands

under the jurisdiction of NYSDEC. The Project will result in the permanent conversion of 2.67 acres of forested wetland under state jurisdiction (see Table 2-3).

## 2.1 Mitigation Goals and Objectives

Goals and objectives of the proposed mitigation project are derived from the lost or impaired functions and values of the on-site wetlands due to the Project activities. Mitigation will offset the adverse effects on the benefits of a wetland and compensate for the lost wetland acreage.

Seventeen wetlands under federal jurisdiction will be permanently impacted by the Project, resulting in the placement of a total of 0.32 acres of permanent fill in the wetlands. None of these wetlands impacted are under jurisdiction of NYSDEC. The placement of permanent fill is associated with access roads and one transmission line pole. The wetlands impacted by placement of permanent fill are emergent, shrub-scrub and forested wetlands that are small to large in size with low to high vegetative diversity. The permanent impacts will result in a loss of wetland area.

**Table 2-1 Total Wetland Impacts, Entire Project**

| | Construction Disturbance[1] | Temporary Impacts (Areas to be Restored to Preconstruction Contours following Construction)[2] | Permanent Impacts (Permanent Placement of Fill)[3] | Clearing[4] |
|---|---|---|---|---|
| Turbines | 0.33 | 0.33 | NA | NA |
| Access Roads | 0.94 | 0.61 | 0.33 | NA |
| Underground Collection | 2.11 | 2.11 | NA | NA |
| Overhead Collection | NA | NA | NA | NA |
| Transmission | 12.49 | 3.49 | 0.0005 | 9.00 |
| **Total** | **15.87** | **6.54** | **0.33** | **9.00** |

[1] Construction disturbance includes all areas to be disturbed during construction activities, as such, they include all impact related to clearing, grading, placement or poles for overhead transmission, placement of wetland mats, and placement of fill. For the generation portion of the Project, this includes the acreage of all wetlands that fall within the construction ROW. For the transmission portion of the Project, this includes the acreage or all wetlands that fall within the 100 foot wide permanent ROW.

[2] Temporary impacts for the generation portion of the Project are defined as wetland impacts associated with filling or excavation activities where the Project Site will be restored to preconstruction contours and elevation. Temporary impacts for the transmission portion of the Project Site are limited to temporary placement of wetland mats within a 30-foot wide travel corridor to provide access across wetlands.

[3] Permanent impacts for both the generation portion and transmission portion of the project refer to permanent placement of fill within wetlands that results in a loss of wetland acreage. Placement of fill includes placement of gravel fill for permanent roadways, and placement of poles for overhead collection or transmission lines.

[4] Clearing refers to clearing of vegetation within the construction ROW for overhead collection or transmission lines with no other ground disturbance. No clearing will occur within the generation portion of the Project. For the transmission portion of the Project this refers to wetlands within the permanent ROW that are not within the 30 foot wide travel corridor.

**Table 2-2 Impacts to Federally Jurisdictional Wetlands, Entire Project[5]**

| | Construction Disturbance[1] | Temporary Impacts (Areas to be Restored to Preconstruction Contours following Construction)[2] | Permanent Impacts (Permanent Placement of Fill)[3] | Clearing[4] |
|---|---|---|---|---|
| Turbines | 0.29 | 0.29 | NA | NA |
| Access Roads | 0.93 | 0.61 | 0.32 | NA |
| Underground Collection | 2.00 | 2.00 | NA | NA |
| Overhead Collection | NA | NA | NA | NA |
| Transmission | 12.49 | 3.49 | 0.0005 | 9.00 |
| **Total** | **15.71** | **6.39** | **0.32** | **9.00** |

[1] Construction disturbance includes all areas to be disturbed during construction activities, as such, they include all impact related to clearing, grading, placement or poles for overhead transmission, placement of wetland mats, and placement of fill. For the generation portion of the Project, this includes the acreage of all wetlands that fall within the construction ROW. For the transmission portion of the Project, this includes the acreage or all wetlands that fall within the 100 foot wide permanent ROW.

[2] Temporary impacts for the generation portion of the Project are defined as wetland impacts associated with filling or excavation activities where the Project Site will be restored to preconstruction contours and elevation. Temporary impacts for the transmission portion of the Project Site are limited to temporary placement of wetland mats within a 30-foot wide travel corridor to provide access across wetlands.

[3] Permanent impacts for both the generation portion and transmission portion of the project refer to permanent placement of fill within wetlands that results in a loss of wetland acreage. Placement of fill includes placement of gravel fill for permanent roadways, and placement of poles for overhead collection or transmission lines.

[4] Clearing refers to clearing of vegetation within the construction ROW for overhead collection or transmission lines with no other ground disturbance. No clearing will occur within the generation portion of the Project. For the transmission portion of the Project this refers to wetlands within the permanent ROW that are not within the 30-foot-wide travel corridor.

[5] Federal Jurisdiction is assumed if there is any evidence of a surface water connection to a waterbody that eventually flows into a traditional navigable waterway (TNW). Final jurisdictional determination will be made by USACE subsequent to field verification.

**Table 2-3 Impacts to State Jurisdictional Wetlands, Entire Project[5]**

| | Construction Disturbance[1] | Temporary Impacts (Areas to be Restored to Preconstruction Contours following Construction)[2] | Permanent Impacts (Permanent Placement of Fill)[3] | Clearing[4] |
|---|---|---|---|---|
| Turbines | NA | NA | NA | NA |
| Access Roads | NA | NA | NA | NA |
| Underground Collection | NA | NA | NA | NA |
| Overhead Collection | NA | NA | NA | NA |
| Transmission | 6.62 | 1.80 | 0.0005 | 4.82 |
| **Total** | **6.62** | **1.80** | **0.0005** | **4.82** |

[1] Construction disturbance includes all areas to be disturbed during construction activities, as such, they include all impact related to clearing, grading, placement or poles for overhead transmission, placement of wetland mats, and placement of fill. For the generation portion of the Project, this includes the acreage of all wetlands that fall within the construction ROW. For the transmission portion of the Project, this includes the acreage or all wetlands that fall within the 100 foot wide permanent ROW.

**Table 2-3 Impacts to State Jurisdictional Wetlands, Entire Project[5]**

[2] Temporary impacts for the generation portion of the Project are defined as wetland impacts associated with filling or excavation activities where the Project Site will be restored to preconstruction contours and elevation. Temporary impacts for the transmission portion of the Project Site are limited to temporary placement of wetland mats within a 30-foot wide travel corridor to provide access across wetlands.

[3] Permanent impacts for both the generation portion and transmission portion of the project refer to permanent placement of fill within wetlands that results in a loss of wetland acreage. Placement of fill includes placement of gravel fill for permanent roadways, and placement of poles for overhead collection or transmission lines.

[4] Clearing refers to clearing of vegetation within the construction ROW for overhead collection or transmission lines with no other ground disturbance. No clearing will occur within the generation portion of the Project. For the transmission portion of the Project this refers to wetlands within the permanent ROW that are not within the 30 foot wide travel corridor.

[5] All state jurisdictional wetlands are a subset of federally jurisdictional wetlands. As such, impacts to state jurisdictional wetlands are included in, and are not additional to, the acreages reported as impacts to federally jurisdictional wetlands. State jurisdiction has been assumed if a field-delineated wetland corresponds to a mapped NYSDEC wetland based on map interpretation, has a surface water connection to a mapped NYSDEC Wetland or if the wetland is thought to exceed 12.4 acres in size. Final jurisdictional determination will be made by NYSDEC subsequent to field verification (Note: No wetlands under State jurisdiction were identified in the generation portion of the Project).

**Table 2-4 Permanent Conversion of Forested Wetlands, Entire Project[2]**

| | Total Forested Wetland Conversion | Federally Jurisdictional Forested Wetland Conversion[1] | State Jurisdictional Forested Wetland Conversion |
|---|---|---|---|
| Turbines | 0.15 | 0.15 | NA |
| Access Roads | 0.18 | 0.18 | NA |
| Underground Collection | 1.11 | 1.11 | NA |
| Overhead Collection | NA | NA | NA |
| Transmission | 3.66 | 3.66 | 2.67 |
| **Total** | **5.11** | **5.11** | **2.67** |

[1] All state jurisdictional wetlands are a subset of federally jurisdictional wetlands. As such, impacts to state jurisdictional wetlands are included in, and are not additional to, the acreages reported as impacts to federally jurisdictional wetlands. State jurisdiction has been assumed if a field-delineated wetland corresponds to a mapped NYSDEC wetland based on map interpretation, has a surface water connection to a mapped NYSDEC Wetland or if the wetland is thought to exceed 12.4 acres in size. Final jurisdictional determination will be made by NYSDEC subsequent to field verification (Note: No wetlands under State jurisdiction were identified in the generation portion of the Project).

[2] Permanent forest conversion is used to indicate the permanent loss of forest cover in wetlands associated with clearing activities, and which will be maintained in a shrub/scrub or emergent condition during operation of Project facilities. It is determined by adding the forested wetland portion of wetland acreages reported for clearing and the forested wetland portion of the wetland acreages reported as temporary impact. It is the total forested wetland that will be permanent converted to herbaceous or shrub scrub communities. It While conversion is recognized as a long term impact, it is distinguished from permanent impacts associated with fill to facilitate review and permitting of the Project. For the generation portion of the Project, this includes the acreages of all the forested wetlands within the construction ROW that will not be permanently filled. Permanent conversion within the transmission portion of the Project includes all forested wetlands within the permanent ROW that will be permanently maintained to prevent reestablishment of trees.

Twenty-nine wetlands under federal jurisdiction will be impacted by permanent conversion, resulting in 5.11 acres of forested wetland that will be converted to emergent or shrub-scrub wetland. Six of these wetlands are also under jurisdiction of NYSDEC. Forest conversion is due to clearing within turbine staging areas, along access roads, along the collection line and along the transmission line. The wetlands impacted by permanent forest conversion are of moderate to large

size with low to high vegetative diversity. The primary function affected is wildlife habitat. This conversion will result in a long-term shift in wildlife habitat functions. The final mitigation plan to be developed during the course of the Joint Permit Application process will address the site-specific cumulative loss of biological function provided by the impacted wetlands, as well as any identified public value. Consistent with USACE and NYSDEC guidance, the goal of the mitigation plan is to create, enhance, and preserve existing wetland functions, values, and ecological integrity at a specific mitigation area to adequately offset the loss of function and value within jurisdictional wetlands resulting from Project implementation.

The conceptual design components that will be implemented to offset permanent fill impacts and permanent conversion impacts in these wetlands include:

- Creation of new wetland area with similar function and value to those lost due to permanent impact;

- Tree planting within and in the vicinity of an existing wetland to compensate for function(s) lost by the conversion of forested wetland to non-forested wetland; and

- Preservation of existing wetlands within the mitigation area via the establishment of conservation easements.

Noble does not plan to acquire the land required to implement this mitigation project. Easement agreements will be sought with landowners for the mitigation site. Noble will discuss with landowners within the Project Area regarding development of on-site mitigation and a conservation easement on the mitigation area. Based on the field surveys and review of mapped NYSDEC wetlands within the Project Area, multiple potential mitigation sites could be considered. Because of the relatively small total acreage of impact, Noble will plan to consolidate mitigation into a single location to maximize functions and values of the mitigation area. By centralizing the mitigation into a single location, Noble believes that the overall value of the mitigation area increases in relation to the surrounding landscape. During the course of the permit review process, Noble will continue coordinating with local landowners regarding the acquisition of suitable parcels to implement mitigation and placement of a conservation easement on the mitigation area.

The proposed mitigation project is intended to compensate for lost function and values of these wetlands while providing more of a benefit at a landscape scale by enhancing one contiguous wetland complex. The primary function of the forested component to be permanently converted is wildlife habitat. The conversion of forested wetland due to ROW clearing and maintenance primarily along the transmission line will result in a long-term shift in wildlife habitat functions. The goals and objectives for this proposed mitigation project are to enhance an existing wetland by planting trees, and to preserve said area via the establishment of

conservation easements. By meeting these goals, wildlife value of the mitigation area is expected to increase.

## 2.2 Mitigation Area Description

Consistent with USACE and NYSDEC guidance, wetland mitigation for Project-related impacts will be accomplished by wetland creation and by tree planting. Wetland creation will offset acreage lost due to permanent fill impacts, and planting trees to offsets conversion of forested wetland to non-forested wetland and compensates for the loss of wetland function. The mitigation area will be hydrologically connected to waters of the United States contiguous with a wetland under the jurisdiction of NYSDEC. A site for the mitigation area(s) will be selected that meets set goals and objectives to counteract wetland impacts from the Project. The location of the mitigation area(s) will be discussed in the Final Mitigation Plan, and the exact mitigation size will be finalized through discussions with USACE and NYSDEC as Project permitting proceeds.

The Project Area is located within the Chautauqua-Conneaut and Conewango watersheds. The watershed boundary locations in relation to Project facilities are depicted in Figure G-5 of Appendix G of the DEIS. The Chautauqua-Conneaut watershed drains generally northwest to Lake Erie. The Conewango watershed generally drains south along Conewango Creek before reaching the Allegheny River. The area chosen for mitigation is expected to be within one or both of these watersheds.

# 3 Implementation Plan

There are several components in the design and implementation of mitigation plans that are necessary procedures to follow in order to ensure success of the mitigation effort. Given the mixed track record of mitigation efforts, good planning and associated design are necessary activities in order to enhance project success. The Implementation Plan, to be included in the Final Mitigation Plan, will include specifications for planting, the sequence of operations, final quantification of materials, development of appropriate best management practices (BMPs) and additional monitoring and maintenance plans. The wetland mitigation area will be designed to provide function and value equal to, or greater than, that of the forested wetlands that are permanently converted to shrub/scrub or emergent wetlands.

The goal of the Implementation Plan is to identify potential required design factors, as well as any necessary constraints that would interfere with the successful tree planting at the mitigation area. The objectives to attain this goal include: examining current vegetation communities in the mitigation area; examining current hydrologic and soil conditions in the mitigation area; determining the most appropriate species to be planted; determining the most efficient and effective means to accomplish tree planting; and ensuring the development of a diverse native plant community that minimizes interferences by invasive species.

## 3.1 Site Preparation

Once a mitigation area has been chosen, additional field reconnaissance will be conducted to further characterize the area and determine preparation needs. Field investigations will include wetland delineations in the mitigation area in order to determine wetland/upland boundaries and to characterize vegetation communities.

## 3.2 Vegetative Establishment

The Implementation Plan will promote the introduction of additional native trees in the mitigation area that will enhance the natural plant communities and improve wildlife habitat. The species will be selected for enhancement of the mitigation area based on the hydrologic and soil conditions at the mitigation site, the species composition of the impacted wetlands, and species typical of undisturbed natural communities in the area.

A detailed wetland planting plan will be developed to provide specifications as to the numbers of each species planted or their application rate (seeding), their location, source of planting material, and establishment methods. The planting plan will be a component of the final mitigation design package. In addition the planting plan will be made available to the USACE and NYSDEC for review.

# 4 Performance Standards and Monitoring

Performance standards will be developed to assess the condition and functionality of the mitigation area. The standards will assess the development and survival of the enhanced vegetation communities. Relative success or failure of the vegetation community will be based on a percent survival that will be developed in conjunction with the agencies and presented in the Final Mitigation Plan.

A maintenance and monitoring plan will be developed and implemented to ensure the vitality and functional integrity of the enhanced wetland. This plan will include elements of vegetative monitoring, invasive species monitoring and control, and faunal monitoring. The goal of the wetland mitigation project is to enhance and preserve wetlands in the Project Area to mitigate for the wetlands that will be impacted by the Project. A stratified sampling plan will be developed in order to estimate percent cover and relative survival of the planted trees. The duration of monitoring will be developed with the regulatory agencies, but will likely involve a five-year timeframe.

# 5 Schedule

Planting of the mitigation site is expected to proceed concurrently with the construction of the Project. Preconstruction design activities as described above will be initiated once the USACE and NYSDEC have approved the site proposed by Noble. In addition, a Final Mitigation Plan, containing the location of the proposed mitigation area and the Implementation Plan will be submitted to NYSDEC and the USACE prior to permit issuance.

# Environmental Monitoring Plan

# DRAFT

## DRAFT ENVIRONMENTAL MONITORING PLAN

**The Draft Environmental Monitoring Plan is a document that has been required for other Noble Windparks by the New York State Department of Environmental Conservation through a condition of the Wetland Permit for Windparks. This document is the compilation of all environmental monitoring of conditions and commitments of all the permits issued. Once all the permits are issued, the document is then completed with the inclusion of a summary of the monitoring requirements and the Permits themselves as listed in the Appendices.**

# Environmental Monitoring Plan
# Noble Ball Hill Windpark LLC

**7294 Centerville Road**

**Bliss, NY 14024**

**September 2008**



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# 1.0 Introduction

## 1.1 Mission Statement

Noble Environmental Power is a leading renewable energy company with approximately 3,850 megawatts (MW) of windparks under development in eight states, including New York, New Hampshire, Vermont, Maine, Michigan, Minnesota, Texas, and Wyoming. Noble is majority-owned by JPMorgan Partners Fund, which is managed by CCMP Capital.

Noble was founded in 2004 in response to growing demand for clean, renewable sources of energy. We have assembled a team of talented and seasoned professionals to design and build state-of-the-art windparks. Our vision is to be a leading supplier of clean, renewable energy from environmentally responsible facilities that will be a source of pride and benefits to the communities in which they are located.

## 1.2 Project Description

Noble Ball Hill Windpark, LLC (Noble) is proposing to construct and operate a wind energy facility (the Project) in the Towns of Villenova and Hanover, Chautauqua County, located in western New York State. The Project consists of generation and transmission components. More specifically, the Project will include the following:

- Installation and operation of 60 wind turbines (49 in the Town of Villenova and 11 in the Town of Hanover) with a capacity of 90 MW within an approximate 13,658-acre Project Area in the Towns of Villenova and Hanover.

- Construction and use of approximately 16 miles of access roads (13 miles in the Town of Villenova and 3 miles in the Town of Hanover) that will connect each wind turbine to a town or county roadway to allow equipment and vehicle access for construction and subsequent maintenance of the facilities as well as emergency services, if needed. After construction, the 35-foot access road will be scaled back to 16 feet, allowing Noble to use the existing roadway for maintenance and operational purposes.

- Construction and use of an electrical collection system that will allow delivery of electricity to a new substation to be constructed in the Town of Hanover. Where practical, the electrical collection system will be installed underground along the same right-of-way (ROW) corridor as the access roads. A total of 23.8 miles of collection lines (including underground collection lines co-located with access roads) will be installed (18.7 miles in the Town of Villenova and 5.1 miles in the Town of Hanover). Approximately 8.5 miles will be installed within new ROWs over private lands between turbines (7.3 miles in the Town of Villenova and 1.2 miles in the Town

of Hanover). As currently designed, nearly the entire the collection system will be installed underground. A total of 174 feet (0.03 miles) of overhead collection lines will be installed in the Town of Villenova. No overhead collection line will be required in the Town of Hanover.

- Construction and use of a new substation (Hanover substation) within the Project Area in the Town of Hanover that will tie into a new 115-kilovolt (kV) transmission line. The substation footprint will be approximately 200 by 300 feet. The substation will be located on and have direct access to Hurlbert Road.

- Construction and use of a switchyard within the Project Area in the Town of Hanover. The switchyard footprint will be approximately 300 by 500 feet. The switchyard will be located on and have direct access to Bennett State Road (County Route 85).

- Construction and use of a 6-mile overhead 115-kV transmission line, sited within the Town of Hanover, to transfer the energy from the new substation to the new switchyard. The proposed switchyard will provide a connection to the existing 230-kV National Grid transmission line that provides access to the grid.

The wind turbines that will be installed at the Noble Windparks will be General Electric 1.5 MW, SLE, 80-Meter, MTS, T-Flange wind turbine generators. The turbine is a three-bladed, upwind, horizontal-axis wind turbine with a rotor diameter of approximately 253 feet. The nacelle is located at the top of each tower and contains the electrical generating equipment. The turbine rotor and the nacelle are mounted on top of a tubular tower giving a rotor hub height of 262 feet. The maximum height for the turbine is 388 feet 9 inches when a rotor blade is at the top of its rotation. Once installed, each wind turbine will occupy a round, slightly exposed base approximately 18 feet in diameter.

### 1.3 Purpose of Environmental Monitoring Plan

The purpose of the Environmental Monitoring Plan is to provide the Environmental Monitor(s) with a reference source to aid in managing the environmental issues that may be encountered during construction of the Noble Ball Hill Windpark (the Project). Environmental impacts may occur during the many phases of Windpark construction including roads, foundations, erosion control devices, electrical collection and transmission lines and equipment, electrical substation and switchyard, and erection of turbine equipment. This document contains the framework for the daily and long-term monitoring and reporting structure to ensure that the Project is completed within the parameters set forth in the permits issued for the Project. The Plan is intended to be a "living" document, which will evolve as the Project progresses and/or as unanticipated issues arise.

This Plan is organized into five sections. Section 2 discusses the organization and supervision of personnel during construction, including reporting structure, authorities,

and responsibilities. Section 3 discussed the monitor's role during construction and provides checklists to be followed during certain activities. Section 4 provides the necessary information to ensure proper documentation of all activities and potential incidents. Section 5 contains a synopsis of the various permit requirements and obligations that must be met during the construction and restoration phases of the Project. In addition, the appendices contain the actual permits that have been issued for the Project, as well as, various documents that will assist the monitors in their daily duties. These documents include specific plans created for the construction of the Project, wetland and stream mapping, and applicable agency guidelines. Documents, such as the Storm Water Pollution Prevention Plan (SWPPP), are included by reference, but not attached to the manual.

# 2.0 Organization and Reporting

The following sections describe the reporting structure and authorities during the construction of the Project. Also included is an organizational chart depicting the organizational structure for all of Noble (see Figure 2-1) and a contact list, to be used by the Environmental Monitor for reporting any incidents that may occur.

## 2.1 Reporting Structure

### 2.1.1 Daily Site Environmental Quality Control/ Quality Assurance

**Environmental Monitors**
Construction will be monitored by Noble personnel, an independent Environmental Monitor, and the Towns' environmental inspectors to ensure that all construction is in accordance with federal, state, and local permits and conditions, agreements, and regulations. Noble will retain an independent Environmental Monitor whose duties will include coordination of monitoring activities, documentation and implementation of mitigation activities as they are conducted, and preparation of a final report for submission to the Towns as well as other involved and interested parties. Noble's independent Environmental Monitor will have complete authority to order the correction of activities in violation of any permits or obligation and to order the temporary cessation of work activities in violation of any permits or regulations until such time as corrective measures have been implemented and accepted by the appropriate agency(ies), as required.

Although an internal organizational structure needs to be in place for reporting, record keeping, and accountability; the Environmental Monitor acts as an independent oversight of the construction activities. The reporting structure is intentionally designed to be independent of any member of the construction staff at the project level and intentionally includes independent access to the Environmental Affairs Group to ensure that the monitor is able to maintain an independent voice and be free of any concern of retributive action for performing the duties of the job. The Environmental Monitor reports to the Manager of Environmental Compliance and concurrently to the local designated Environmental Affairs Group Representative. Minor issues (issues unrelated to permit compliance) will be reported to the Resident Site Construction Manager for prompt resolution/intervention as necessary. If practical at the time, the decision to issue a stop work order should be made in consultation with either the Manager of Environmental Compliance or with the representative of the Environmental Affairs Group. However, if they are unable to be reached in a timely fashion, the monitor shall have the authority to stop work to halt or prevent environmental permit non-compliance and shall be expected to exercise that right, when required.

### 2.1.2 Environmental Quality Assurance Auditing

**Environmental Affairs Group**
The Environmental Affairs Group consists of the Environmental Project Manager and the Vice President of Environmental and Regulatory Affairs, to whom the environmental managers and field engineers report. They are responsible for communicating permit conditions to the Environmental Monitoring Personnel, the Engineering and Construction Group, and the Operations Group, and identifying potential environmental issues associated with a given project. The Environmental Affairs Group provides support to and technical oversight of the Environmental Monitor to ensure that the intent of all permit conditions of an environmental nature are known and adhered to. The Environmental Affairs Group has stop work authority, which shall be exercised through the Environmental Monitor or independently in an emergent situation. The Group reports to the Vice President of Asset Management.

**Manager of Environmental Compliance**
The Manager of Environmental Compliance manages the Quality Assurance and Quality Control (QA/QC) monitoring for all aspects of the construction of the Project. He is responsible for assigning competent persons to the monitoring positions to ensure compliance with regulations and permits. The Manager of Environmental Compliance has stop work authority for any non-compliance issues, including permit non-compliance. He reports to the Senior Vice President of the Construction and the Senior Vice President of Operations.

### 2.1.3 Corporate Environmental Oversight

**Senior Vice President of Construction/Senior Vice President of Operations/Vice President of Asset Management**
These positions have the ultimate responsibility for compliance with all permits and regulations. The Vice President of Asset Management reports to the Executive Vice President of Development. The Senior Vice President of Construction and the Senior Vice President of Operations report directly to the Chief Executive Officer. They provide direction to the QA/QC and Environmental Affairs Groups.

**Figure 2-1 Noble Environmental Power Organizational Chart**

**To Be Determined**

## 2.2 Authority and Responsibilities of the Environmental Monitor

The Environmental Monitor has the authority and responsibility to perform the following tasks:

- Ensure that all environmental permits have been received and that applicable agency notifications as required by all permits have been given prior to commencing work in a given area. This can be done in coordination with the Environmental Affairs Group.

- Conduct pre-construction meetings with contractors to review applicable permit conditions and requirements specific to the contractor's scope of work. This occurs a minimum of once during the general construction pre-bid and kickoff meetings held for each new contractor.

- Conduct contractor "tailgate" sessions, as necessary, to review applicable permit conditions and potential problem areas for a given area of construction. These will occur on a regular basis, typically concurrent with the safety meetings held at the construction site which would normally occur once a week.

- Monitor and document the contractors' adherence to all environmental specifications.

- Ensure the proper installation and maintenance of all sediment and erosion control structures as dictated by the SWPPP and any other structures or features required by permit, regulations, or company policy. This task includes determining whether the contractors' work and material are in conformance with the specifications and drawings.

- Prepare all required documentation, including, but not limited to, Daily Reports, Weekly Reports, Monthly Reports, and Non-Compliance Reports, as necessary.

- Make required internal and agency notifications when non-compliance or any reportable violations occur.

- Stop work if the contractor is conducting an activity in violation of the permits and regulations.

- Order remedial action for violations of environmental regulations.

The Environmental Monitor **does not** have the authority to:

- Change the requirements and specifications of the Project drawings without getting approval from the resident construction manager after engineering and permit compliance review.

- Allow the contractor to change their scope of work. Changes to work scopes must be approved by the resident construction manager after engineering and permit compliance review.

- Direct the contractor's work (except with respect to stop-work orders) as the contractor must preserve their independent contractor status.

## 2.3 Contact List

Noble Ball Hill Windpark LLC
7294 Centerville Road
Bliss, NY 14024
(585) 322-7675

Noble Contacts:

| | |
|---|---|
| Chief Executive Officer | Walter Q. Howard |
| Executive VP, Development | John Quirke |
| Senior VP, Operations | Daniel Mandli |
| Senior VP, Construction | Jeffrey J. Taylor |
| VP, Asset Management | Daniel Nugent |
| VP, Environmental Management | Sandy Sayyeau |
| Manager of Environmental Compliance | Patrick McCarthy |
| Environmental Project Manager | Kristin Hawley |

| Agency Contact List | | | | |
|---|---|---|---|---|
| **Agency** | **Contact Person** | **Responsibility** | **Phone** | **Address** |
| U.S. Army Corp of Engineers | Steven Metivier (Biologist) | Wetland issues | (716) 879-4313 | Department of the Army<br>Buffalo District, Corps of Engineers<br>1776 Niagara Street<br>Buffalo, NY 14207-3199 |
| New York State Department of Environmental Conservation – Region 9 | Charles Rosenburg (Biologist) | Wetland issues, wildlife issues | (716) 851-7000 | NYSDEC<br>270 Michigan Ave.<br>Buffalo, NY 14203-2999 |
| | Daniel King (Spill Prevention & Response) | Spills | (716) 851-7220 | NYSDEC<br>270 Michigan Ave.<br>Buffalo, NY 14203-2999 |
| New York State Department of Environmental Conservation | | Permit compliance | | Chief Permit Administrator<br>NYSDEC Headquarters<br>625 Broadway<br>Albany, NY 12233-1750 |
| New York State Spill Hotline | | Spills | (800) 497-7362 | n/a |
| U.S. Fish and Wildlife Service | Timothy R. Sullivan | Wildlife issues | (607) 753-9334 | US Fish & Wildlife Service<br>3817 Luker Road<br>Cortland, NY 13045 |
| New York State Department of Agriculture and Markets | Michael Saviola (Associate Environmental Analyst) | Agricultural issues | (585) 658-9854 | New York State Department of Agriculture and Markets<br>158 Main Street<br>Mt. Morris, NY 14510-1595 |
| Chautauqua County Soil and Water Conservation District | Fred Croscut | Agricultural issues, storm water control, drain tile | (716) 664-9502 | Chautauqua County SWCD<br>3542 Turner Road<br>Jamestown, NY 14701--9607 |


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| Agency Contact List | | | | |
|---|---|---|---|---|
| **Agency** | **Contact Person** | **Responsibility** | **Phone** | **Address** |
| New York State Department of Public Service | Andrew Davis | CPCN and Article VII compliance. | (518) 474-7080 | New York State Department of Public Service<br>Empire State Plaza<br>Agency Building 3<br>Albany, NY 12223-1350 |
| New York State Office of Parks Recreation and Historic Preservation, State Historic Preservation Office (SHPO),<br>Field Services Bureau | Nancy L. Herter (Archaeologist) | Historic issues, unanticipated remains or cultural finds. | (518) 237-8643, ext. 3280 | Address: P. O. Box 189, Waterford, NY 12188-0189<br><br>Express Address: Delaware Ave., Cohoes, New York 12047 |



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# 3.0 Environmental Monitoring Program

The Environmental Monitor will be responsible for representing Noble and enforcing the environmental permits and regulations pertaining to the Project. The monitor will work under the supervision of the Manager of Environmental Compliance in consultation with the Environmental Affairs Group, and will have peer status with the other QA/QC monitors on the Project site. For general non-compliance issues the monitor will work in conjunction with the Compliance and the Construction or Operations personnel responsible for the areas where the non-compliance exist to resolve the issue and rectify any problems. For non-compliance situations where substantial environmental damage is imminent, the monitor will immediately order the cessation of the activity or rectification of the problem. Any requisite agency notifications should then be made and the Manager of Environmental Compliance and/or the on-site Environmental Affairs Representative should be contacted.

## 3.1 General Activities

The Environmental Monitor will ensure contractor compliance with Noble's environmental plans and programs as well as all federal, state, and local permits and approvals. To achieve this goal, the Environmental Monitor will have the following responsibilities:

- Observation and documentation of all construction activities to ensure that all work is completed in compliance with the requirements of all federal, state, and local permits and approvals. The monitor will also ensure that this work is in compliance with the environmental aspects of the drawings and specifications issued for the Project. Reports, photographs, and as-built information will be gathered to demonstrate compliance per permit requirements. The ability to order the cessation of work and rectification of violations will empower the monitor to ensure adherence to environmental permits and standards. In addition, the monitor has the ability to directly contact the applicable agencies representatives to resolve problems.

- Ensure that temporary and permanent stormwater and erosion controls are installed and maintained in accordance with the Project SWPPP.

- Identify any areas where the stormwater and erosion controls are deficient or ineffective and require such deficiencies to be corrected as per specifications or regulations.

- Ensure that all construction personnel and equipment stay within the designated construction ROW and use only approved access roads.

- Ensure that fuel handling and equipment maintenance operations are performed outside approved buffer areas for wetlands and water bodies. Also, ensure that the

contractor maintains the necessary spill response material as mandated by the SWPPP and Noble's spill control plan. General actions to be taken in the event of a chemical spill or release are outlined in the Emergency Response Plan.

- Recognize previously identified sensitive areas, such as wetlands, where special construction techniques will be required. Ensure that work in these areas is conducted as per the drawings and specifications approved for these areas and in accordance with all federal, state, and local permit conditions.

- Ensure that work within agricultural fields is conducted in accordance with the guidance document issued by the New York State Department of Agriculture and Markets (NYSDAM). This includes proper stockpiling of topsoil, segregation of subsoil and topsoil, and restoration methodologies. The guidance is provided as an appendix.

- Ensure that all environmental mitigation and restoration plans (e.g., stream and wetland crossings, seeding, erosion control, decompaction) are properly implemented in accordance with Noble's drawings and specifications and in accordance with all federal, state, and local permit conditions.

- Preparation of daily reports of inspection activities that document compliance and noncompliance situations where remedial action is required.

- Preparation of monthly and final reports, as required.

Applicable checklists and daily inspection logs will serve as a basis for the reporting structure.

### 3.2 Daily Activities

The Environmental Monitor will conduct daily inspections of all areas of ongoing construction activities with an emphasis on those activities that occur within environmentally sensitive areas. The monitor will be responsible for establishing his/her daily inspection priorities, depending on the nature and location of ongoing activities and the sensitivity of a given area. In general, the schedule will include time in the morning to meet with construction staff and the Environmental Affairs staff to obtain schedule updates and priorities, in-field monitoring activities, and time in the evening for completion and filing of monitoring reports. Activities that will be focused on include initial grading activities in agricultural fields, crossings of wetlands or streams, and installation of SWPPP measures. As part of the environmental inspection routine, it is anticipated that several operations occurring throughout the Project Area will need to be spot-checked on a daily basis. For instance, clearing and grading activities may be prioritized over inspection of a less intensive activity. Should the construction work extend into nighttime hours or weekends, the environmental monitoring staff will adjust

their work schedules (e.g., one monitor may start early and one later so one can stay later) to cover work in environmentally sensitive areas

### 3.3 Incident Investigation

An environmental incident is defined as an unplanned event with the potential for undesirable environmental consequences. These incidents can range from a "near miss" to an accident. A near miss is an action that had the potential to create an environmental incident, however, no adverse affect occurred. These incidents will be documented in the daily report, highlighted, and distributed to the Resident Construction Manager in order to ensure that the action does not occur in the future and result in an adverse affect on the environment. These incidents will be documented in the daily reports. An accident is a situation where an action occurs that results in an actual adverse affect on the environment. In this instance, a noncompliance report will be completed.

All environmental incidents, including near misses, should be verbally reported to the Manager of Environmental Compliance and the Environmental Affairs Group within one hour of the occurrence, or as soon as practical after the situation has been controlled by the Environmental Monitor. In situations where immediate regulatory notifications are required, such as spills that exceed the reportable quantities limitations, the notification will be made immediately by the monitor in the field. The Environmental Monitor will document the incident and provide the report to the Manager of Environmental Compliance by the end of the business day. The Manager of Environmental Compliance will be responsible for further coordination. Where immediate notification is not required, notification may be made by the Environmental Monitor. These notifications may include spills that do not exceed the reportable quantity threshold or situations where damage occurs to wetlands or streams outside of the permitted areas. In these cases, NYSDEC and the USACE will be notified so that the agencies have an opportunity to provide guidance toward remediation.

All of the following will be conducted by the Environmental Monitor, hence its inclusion in a section on the Environmental Monitor's duties in Section 2.2. Incident investigation will involve determining, to the level of detail possible, the cause of the incident. A critical aspect of these investigations will be determining actions or policies that can be implemented to minimize the possibility of recurrence. If preventative actions are developed, they will be integrated into the tailgate meetings conducted with contractors, and a notice will be sent within the company to ensure integration on all of Noble's project sites. These changes to policies will also be noted on the inspector's daily/monthly reports.

# 4.0 Project Documentation

Detailed documentation is vital to ensuring compliance with regulatory requirements and standards associated with sensitive environmental issues and areas. Project documentation also simplifies the Environmental Monitor's responsibilities by providing a framework for addressing all potential implications of a construction project on the environment.

Noble's environmental monitors will be responsible for preparing and submitting several reports; consisting of summaries of daily, monthly, and post-construction activities. The Environmental Monitor may also be required to prepare periodic and/or final reports for submittal to local, state, or federal agencies; depending on conditions attached to permits received from these agencies.

## 4.1 Daily Report

A major responsibility of the Environmental Monitor is accurate and detailed documentation of their daily inspection activities. A great deal of the daily communication that occurs on a construction site is informal and verbal. It is also critical that the monitor is able to spend as much time as possible in the field. As such, it is critical to have an efficient, consistent, and accurate method of recording and reporting necessary observations for the project record. The vehicle used to record this information must be thorough, but avoid time consuming paperwork that would minimize the monitor's time spent actively observing activities.

Noble's independent Environmental Monitor will be required to maintain a log book, used to record daily activities and to maintain a log of photographic documentation. The log book will contain documentation of daily construction activities, weather conditions, construction progress, pertinent conversations, and compliance issues. The information collected in the log book will then be summarized into a daily report, which will serve as the permanent record of activities occurring on the site. In addition to the logbook, several checklists or forms may be used to provide a succinct reporting form for certain activities. These include SWPPP monitoring, wetland and waterbody crossings, and non-compliance reports.

## 4.2 Monthly Report

In order to track progress of the individual projects, Noble requires a monthly status report from all departments within the company. The Environmental Monitor will be required to provide a monthly status update summarizing activities that occurred on the site including detailed description of any non-compliance issues that may have occurred. The information complied in the daily reports will be used to compile this summary.

## 4.3 Post Construction Report

Upon completion of the construction and restoration of the Project Site, the monitor will be required to complete a Post Construction Report. The report will summarize the restoration measures implemented on the Project Site including, but not limited to, the documentation of the permanent storm water controls, restoration activities in agricultural land (e.g., topsoil replacement, removal of geotextile fabric, removal of large rocks, repair of drain tile), restoration within wetlands and stream crossings, and documentation of any reseeding or planting that is undertaken for restoration in accordance with applicable permits and restrictions. The daily and monthly summaries will be used to compile this report. This report will be provided to all interested agencies including the Towns, NYSDEC, the USACE, and NYSDAM.

## 5.0 Permit Conditions

This section summarizes the applicable permit conditions attached to state and federal permits obtained by Noble for construction of the Project. The conditions listed here are those specifically pertaining to environmental issues that may be encountered during construction. The complete permits, with all conditions, are attached to this document as appendices.

TO BE DEVELOPED

# APPENDICES

# APPENDIX A

# UNITED STATES ARMY CORP of ENGINEERS PERMIT

# APPENDIX B

# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PERMIT

# APPENDIX C

# PUBLIC SERVICE COMMISSION – CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

# APPENDIX D

# TOWN OF VILLENOVA SEQRA STATEMENT OF FINDINGS

# APPENDIX E

# TOWN OF VILLENOVA and TOWN OF HANOVER SPECIAL USE PERMIT CONDITIONS

# APPENDIX F

# TOWN OF HANOVER SPECIAL USE PERMIT CONDITIONS

# APPENDIX G

# NOBLE BALL HILL WINDPARK WETLAND AND STREAM LOCATION MAPS

# APPENDIX H

# NYSDAM GUIDELINES FOR THE CONSTRUCTION OF WIND FARMS

# APPENDIX I

# SWPPP MONITORING REQUIREMENTS

# APPENDIX J

# PLAN FOR UNANTICIPATED DISCOVERIES

# APPENDIX K

# NOBLE BALL HILL WINDPARK INVASIVE SPECIES MANAGEMENT PLAN

## Invasive Species Control Plan

The Noble Ball Hill Windpark Project will result in disturbance to wetlands and riparian areas during construction and operation of the Project. Wetland habitats and riparian zones are susceptible to a variety of biological stressors and direct impacts as the result of disturbance to existing hydrology, soils, and vegetation. A major threat to these systems following perturbations in the existing ecology are invasive species. Invasive plant species considered high risk of colonization within targeted windpark development areas are purple loosestrife (*Lythrum salicaria*), common reed or phragmites (*Phragmites australis*), Japanese knotweed (*Polygonum cuspidatum*), smooth buckthorn (*Rhamnus frangula*), garlic mustard (*Alliaria petiolata*) and Eurasian water milfoil (*Myriophyllum spicatum*). Based on observations during field surveys, Japanese knotweed, phragmites and garlic mustard were identified within the Project Area of the Noble Ball Hill Windpark. Inadvertent introduction of these species into an area through the movement of topsoil, fill, and construction equipment is possible.

Japanese knotweed was observed within the Transmission Line construction disturbance right-of-way (ROW) within and to the north of field-delineated wetland W105. This wetland is shown on wetland mapping as part of the Noble Ball Hill Wetlands and Waterbodies Report in Appendix G of the Draft Environmental Impact Statement (DEIS). Japanese knotweed was also observed in several locations throughout the Project Area that are not in the vicinity of construction disturbance.

Phragmites and garlic mustard were also observed in several locations throughout the Project Area along roadsides and disturbed areas. Neither of these species occur within the construction disturbance ROW.

This plan describes the best management practices (BMPs) Noble will implement to ensure that its activities do not increase the presence of the invasive species mentioned above, within federal and the New York State Department of Environmental Conservation (NYSDEC) regulated wetlands, riparian areas, and NYSDEC regulated adjacent areas falling within the Project Site. The Project Site contains all parcels of the Project Area that have the potential to be permanently or temporarily disturbed as a result of the construction or operation of Project facilities. The Project Area is defined as the outer boundary of the geographic area that includes all turbine sites, access roads, transmission line and collection system components, substation, and switchyard. For the purposes of this discussion, the term federal and NYSDEC-regulated area, or "FDRA" will be used to refer to those wetland, riparian, and NYSDEC regulated adjacent areas that are specifically covered by NYSDEC and United States Army Corps of Engineers (USACE) permits, and that will be temporarily or permanently impacted as a result of constructing and operating the Noble Ball Hill Windpark.

Ten wetlands delineated within the Project Site are assumed to be under jurisdiction of NYSDEC because they correspond to or were in proximity to mapped NYSDEC regulated wetlands, or they are at least 12.4 acres in size. Of these, field-delineated wetlands W110 and W111 correspond to mapped NYSDEC wetland SC-12, and W59, W60, W61, W62, W63, W64, and W65 correspond to mapped NYSDEC wetland SC-13. In addition, based on field surveys, wetland W104 is likely at least 12.4 acres in size. It is not currently mapped by NYSDEC but due to its size may fall under NYSDEC jurisdiction. This determination would be made by NYSDEC subsequent to field review.

The goal of all Noble invasive species management efforts will be to prevent the introduction and spread of invasive species listed above to new locations resulting from Project activities within the FDRA and a 0% net increase in the areal coverage of invasive species resulting from Project activities within the limits of the FDRA ("Baseline Survey", as described below) for five years post construction. The implementation of these BMPs coupled with active monitoring and intensive management for five years post construction will help ensure the success of this Plan.

As the first step in implementing the Plan, during the siting studies and wetland delineation surveys for the Project, Noble conducted a comprehensive survey of the wetlands, riparian areas, and NYSDEC-regulated adjacent areas within the FDRA to document the presence of purple loosestrife, phragmites, Japanese knotweed, smooth buckthorn, and Eurasian water milfoil (collectively referred to as "Invasive Species"). This survey establishes a pre-construction measure of percentage areal coverage of invasive species.

## Best Management Practices

1. **Identification of Infected Areas.** The FDRA will be inspected for the presence of Invasive Species prior to disturbance. Areas containing an infestation within the limits of the FDRA will be clearly identified in the field using highly visible marking tape. A baseline survey report will be prepared and submitted to both NYSDEC and the USACE in advance of construction activities. Noble will request NYSDEC and the USACE to document receipt of, and concurrence with, the Baseline Survey.

2. **Inspection of Fill Sources.** NYSDEC has indicated that many gravel mines across the state contain infestations of invasive species. Prior to the initiation of construction, Noble will identify satisfactory locations for fill and/or construction material including top soil, sand, gravel, rock, and crushed stone, from commercial mines and other off-site locations. Identified locations shall be inspected by Noble environmental staff for the above-mentioned invasive species and measures will be taken to prevent the inadvertent transport of propagules or seeds to Noble's FDRA. Preventive measures may include opting for different fill sources, or eliminating all invasives before using the fill source, if possible

3. **Invasive Plant Material Removal and Transportation.**

    - ***During Construction.*** Where populations of invasive species are encountered in the FDRA during project construction, these plants will be spot treated with herbicides using a NYSDEC-approved application method prior to removal of the plant material. All chemical treatments will be undertaken in strict accordance with all manufacturer guidelines and federal, state, and local laws. Noble will coordinate with NYSDEC regarding disposal options for specific species as they are identified. With most species, the dead plant material will be segregated from the soil by hand and transported to a designated off-site location in a truck with a cap or topper to securely fasten the load and prevent loss of the material during transport. A single off-site location will contain a disposal container or dumpster designated only for invasive plant material to prevent the spread of invasives throughout the Project Site (and throughout the disposal location). The dumpster will be in an open area and contain a black fitted cover to compost or liquefy the plant material. The dumpster will be monitored by Noble environmental staff to ensure the cover is secure and to monitor the progress of the composting. Once the

material is broken down to the satisfaction of Noble environmental staff, the material will be disposed of in an approved sanitary landfill based on consultation with NYSDEC.

If the areal coverage of the invasive species within the FDRA is greater than 75%, removal of the topsoil to a depth of 16 inches may be considered, depending on site conditions. This topsoil would be replaced with hydric soil or topsoil with a high organic content from a source inspected and deemed free of invasive species. Pre-construction contours will be restored. The infected soil will be removed from the site and disposed of in a suitable upland location (an acceptable distance away from another wetland) or in an approved sanitary landfill based on consultation with NYSDEC. Stripping of topsoil will not be the preferred method of invasive species removal when the species can be counted as individuals and do not dominate an area since this method of control could potentially create a greater disturbance to adjacent unaltered wetland or riparian areas, inadvertently creating conditions more favorable for invasive species or for the establishment of an undesirable plant community.

If Eurasian water milfoil, a submerged aquatic plant, is found within the FDRA, it will be removed by hand and placed into 3-millimeter (mm) thick black plastic contractor bags or in a dumpster depending on quantity for composting or landfill disposal depending on the time of year. This disposal method will prevent alteration of the bed of shallow aquatic habitats and excessive suspended sediments.

- ***Post Construction.*** If invasive species are found post-construction in the FDRA after restoration of these areas, herbicides will be used to spot treat the area of infection. All chemical treatments will be undertaken in strict accordance with all manufacturer guidelines and federal, state and local laws, and will be coordinated with regional NYSDEC staff. The dead plant material will be removed by hand and disposed of by placing the material in 3-mm-thick black plastic contractor bags. The bags will be sealed and hauled off site in a truck with a cap or topper to securely fasten the load and prevent loss of the material during transport. The bags will be disposed of in an approved sanitary landfill. This area will then be reseeded using the mix or equivalent described in Section 5. A cover crop such as annual rye may be used as a temporary stabilizing agent depending on site conditions and time of year.

4. **Equipment Sanitation**. Per Noble's Environmental Monitoring Program, all earth moving machinery and excavation equipment (motorized or hand powered) will be inspected and cleaned of extraneous soil and debris prior to entry to the Project Site.

   Earth moving and excavation equipment used in an FDRA where Invasive Species are present will be cleaned free of debris and soil within an upland area near the infected area prior to the removal of the equipment from the FDRA. Equipment cleaning will consist of a combination of mechanical removal of excess dirt and washing with a mobile pressure washer. This will help prevent the transport of invasive plant seeds or plant propagules to unaffected areas within the FDRA. Erosion and sediment control measures will be implemented to prevent degradation of water quality during this process.

5. **Restoration.** Portions of the FDRA temporarily impacted during the construction of the Project will be restored to pre-construction contours and revegetated immediately following the completion of regulated activities at each site. An appropriate native seed mixture shall

be selected based on pre-disturbance surveys. All seed will be from local sources, to the extent possible dependant upon seed availability, and applied at recommended rates.

An FACW (Wet Meadow Mix) seed mixture, available from *Ernst Conservation Seed* (ERNMX-122) (Ernst Conservation Seeds, 9006 Mercer Pike in Meadville, Pennsylvania 16335, 1-800-873-3321), or an equivalent approved seed mix, will be used in the restoration of all wetland areas and riparian zones impacted by construction activities. This seed mixture contains the following plant makeup:

| Percentage | Botanical Name | Common Name |
|---|---|---|
| 20.00 | *Elymus virginicus* | Virginia Wild Rye |
| 19.00 | *Carex vulpinoidea* | Fox Sedge |
| 6.00 | *Scirpus atrovirens* | Green Bulrush |
| 5.50 | *Verbena hastate* | Blue Vervain |
| 5.00 | *Heliopsis helianthoides* | Ox-Eye Sunflower |
| 3.50 | *Glyceria striata* | Fowl Mannagrass |
| 3.00 | *Carex lurida* | Lurid/Shallow Sedge |
| 3.00 | *Gylceria grandis* | American Mannagrass |
| 3.00 | *Juncus effuses* | Soft Rush |
| 2.50 | *Carex scoparia* | Blunt Broom Grass |
| 2.50 | *Mimulus ringens* | Square Stemmed Monkey Flower |
| 2.50 | *Onoclea sensibilis* | Sensitive Fern |
| 2.50 | *Vernonia gigantea* | Giant Ironweed |
| 2.00 | *Carex comosa* | Cosmos/Bristly Sedge |
| 2.00 | *Eupatorium fistulosum* | Joe Pye Weed |
| 2.00 | *Eupatorium maculatum* | Spotted Joe Pye Weed |
| 2.00 | *Helenium autumnale* | Common Sneezeweed |
| 2.00 | *Iris versicolor* | Blue Flag |
| 2.00 | *Scirpus polyphyllus* | Many Leaved Bulrush |
| 1.50 | *Carex lupulina* | Hop Sedge |
| 1.50 | *Juncus tenuis* | PA Ecotype Path Rush, PA Ecotype |
| 1.00 | *Carex stipata* | Awl Sedge |
| 1.00 | *Geum laciniatum* | Rough Avens |
| 1.00 | *Glyceria canadensis* | Rattlesnake Grass |
| 1.00 | *Senna hebecarpa* | Wild Senna |
| 1.00 | *Solidago patula* | Rough Leaved Goldenrod |
| 0.50 | *Carex tribuloides* | Bristlebract Sedge |
| 0.50 | *Lilium superbum* | Turk's Cap Lilly |
| 0.50 | *Penthorum sedoides* | Ditch Stonecrop |
| 0.50 | *Thalictrum pubescens* | Tall Meadow Rue |

6. **Restoration Monitoring.** Restoration monitoring of the FDRA for invasive species will be integrated into the wetland mitigation site monitoring program for the first five years post-construction. This monitoring will be conducted through routine inspections conducted by Noble environmental staff, and biannually during the growing season.

Noble will update the baseline survey report as necessary to document any increased areal coverage of invasive species in the FDRA, and provide any such updates to NYSDEC and the USACE.

If areal coverage of the invasive species in the FDRA increases over the Baseline Survey level, on an areal percentage basis, Noble will coordinate with NYSDEC and the USACE to confirm whether it is the result of Project or non-Project related activities. If such increase is determined to be the result of Project activities, remedial actions will be undertaken immediately.

This Invasive Species Control Plan shall be considered successful when a 0% net increase in the areal coverage of Invasive Species in the FDRA compared to the Baseline Survey is achieved.

Noble will provide NYSDEC and the USACE with a restoration monitoring report detailing the status of invasive plant species within the FDRA and all measures taken to meet the success standards by December 31 of the monitoring year. This report will be submitted as an attachment to the Wetland Mitigation Monitoring Report, which documents the success of the wetland mitigation area development. If the restoration monitoring report demonstrates a 0% increase areal coverage of invasive species in the FDRA prior to the end of the five-year monitoring period, Noble will formally request NYSDEC and the USACE to concur and deem this condition of the permit to be met and allow invasive species monitoring to cease. If the goal of this Invasive Species Control Plan is not met within the first five years post-construction, Noble will review its control efforts with NYSDEC and USACE, submit a revised control plan, and implement applicable control actions for an additional monitoring term.

# J

# Bird and Bat Risk Assessment

# Bird and Bat Risk Assessment
# Noble Ball Hill Windpark
# Towns of Villenova and Hanover,
# Chautauqua County, New York

**September 2008**

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# List of Abbreviations and Acronyms

| | |
|---|---|
| agl | above ground level |
| amsl | above mean sea level |
| arl | above radar level |
| BBA | Breeding Bird Atlas |
| BBRA | bird and bat risk assessment |
| BBS | breeding bird surveys |
| BCA | bird conservation area |
| BCI | Bat Conservation International |
| BOS | Buffalo Ornithological Society |
| CBC | Christmas bird count |
| DEIS | Draft Environmental Impact Statement |
| E & E | Ecology and Environment, Inc. |
| ESA | Endangered Species Act |
| FAA | Federal Aviation Administration |
| GAO | Government Accountability Office |
| GE | General Electric |
| GIS | geographic information system |
| GPS | global positioning system |
| HMANA | Hawk Migration Association of North America |
| hr | hour |
| IBA | important bird areas |
| kHz | kiloHertz |
| km | kilometer |
| kV | kilovolt |
| kW | kilowatt |
| LLC | Limited Liability Company |
| met | Meteorological (tower) |

## List of Abbreviations and Acronyms (cont.)

| | |
|---|---|
| MHz | megaHertz |
| MTS | modular tower system |
| MW | megawatt |
| NHP | Natural Heritage Program |
| Noble | Noble Ball Hill Windpark, LLC |
| NWCC | National Wind Coordinating Committee |
| NWI | National Wetland Inventory |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSOA | New York State Ornithological Association |
| ROW | right-of-way |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| WEST | Western EcoSystems Technology, Inc. |
| WMA | wildlife management area |
| WNS | white-nose syndrome |

# 1 Introduction

## 1.1 Project Description

Noble Ball Hill Windpark, LLC (Noble) is proposing to construct and operate a wind energy facility (the Project) in the Towns of Villenova and Hanover, Chautauqua County, located in western New York State (see Figure 1-1). The project consists of generation and transmission components.

### 1.1.1 Ball Hill Project Area

Currently, the Project will include the following:

- Installation and operation of 60 wind turbines (49 in the Town of Villenova and 11 in the Town of Hanover) with a capacity of 90 megawatts (MW) within an approximately 13,658-acre Project Area in the Towns of Villenova and Hanover;
- Construction and use of approximately 16 miles of access roads (13 miles in the Town of Villenova and 3 miles in the Town of Hanover) that will connect each wind turbine to a Town or County roadway to allow equipment and vehicle access for construction and subsequent maintenance of the facilities;
- Construction and use of an electrical collection system (23.8 miles) that will allow delivery of electricity to a new substation to be constructed in the Town of Hanover. Nearly the entire collection system will be installed underground. One hundred seventy four feet of overhead collection line will be installed in the Town of Villenova;
- Construction and use of a new substation (Hanover substation) within the Project Area in the Town of Hanover that will tie into a new 115-kilovolt (kV) transmission line. The substation footprint will be approximately 200 by 300 feet. The substation will be located on and have direct access to Hurlbert Road;
- Construction and use of a switchyard within the Project Area in the Town of Hanover. The switchyard footprint will be approximately 300 by 500 feet.

The switchyard will be located on and have direct access to Bennett State Road (County Route 85); and

- Construction and use of a 5.95-mile overhead 115-kV transmission line, sited within the Town of Hanover to transfer the energy from the new substation to the new switchyard. The proposed switchyard will provide connection to existing 230-kV National Grid transmission line which provides access to the grid.

### 1.1.2 Turbine Description

The wind turbines that will be installed at the Windpark will be General Electric (GE) 1.5-MW, Model sle, 80-meter, modular tower system (MTS), T-Flange wind turbine generators[1]. The turbine is a three-bladed, upwind, horizontal-axis wind turbine with a rotor diameter of 253 feet (77 meters) (see Figure 1-2). The nacelle is located at the top of each tower and contains the electrical generating equipment. The turbine rotor and nacelle are mounted on top of a tubular tower, giving a rotor hub height of 263 feet (80 meters) (see Figure 1-2). The maximum height for the turbine is 389 feet (118.5 meters) when a rotor blade is at the top of its rotation. Once installed, each wind turbine will occupy a round, slightly exposed base approximately 18 feet (5.5 meters) in diameter.

Section 1.3 of the Draft Environmental Impact Statement (DEIS) describes the process used to select turbine site locations. A number of factors, including proximity to wetlands were evaluated in determining where to locate turbines. A specific discussion of impacts to wetlands is found in Section 2.8 of the DEIS. The proposed turbine sites represent a balancing of the site selection criteria.

## 1.2 Project Background

In order to provide supporting documentation for the environmental assessment, Noble has undertaken this study to assess the potential for impacts to birds and bats associated with the Project. Noble conducted bird and bat studies in the Project Area through its consultant, Ecology and Environment, Inc. (E & E). The study had the following objectives:

1. Collect information on the occurrence and distribution of birds in the Project Area during migratory and breeding seasons.

2. Collect baseline information on flight directions, passage rates, and flight altitudes of nocturnal targets (migratory birds and bats).

[1] 1.5MW refers to the production capacity of the turbine, which is 1.5 megawatts. The nomenclature “sle” is used to designate that the diameter size of the turbine rotor is 253 feet. 80-meter refers to the height of the tower. MTS (Modular Tower System) designates the type of tower configuration, and T-Flange designates the type of flange used to connect the tower directly to the foundation.

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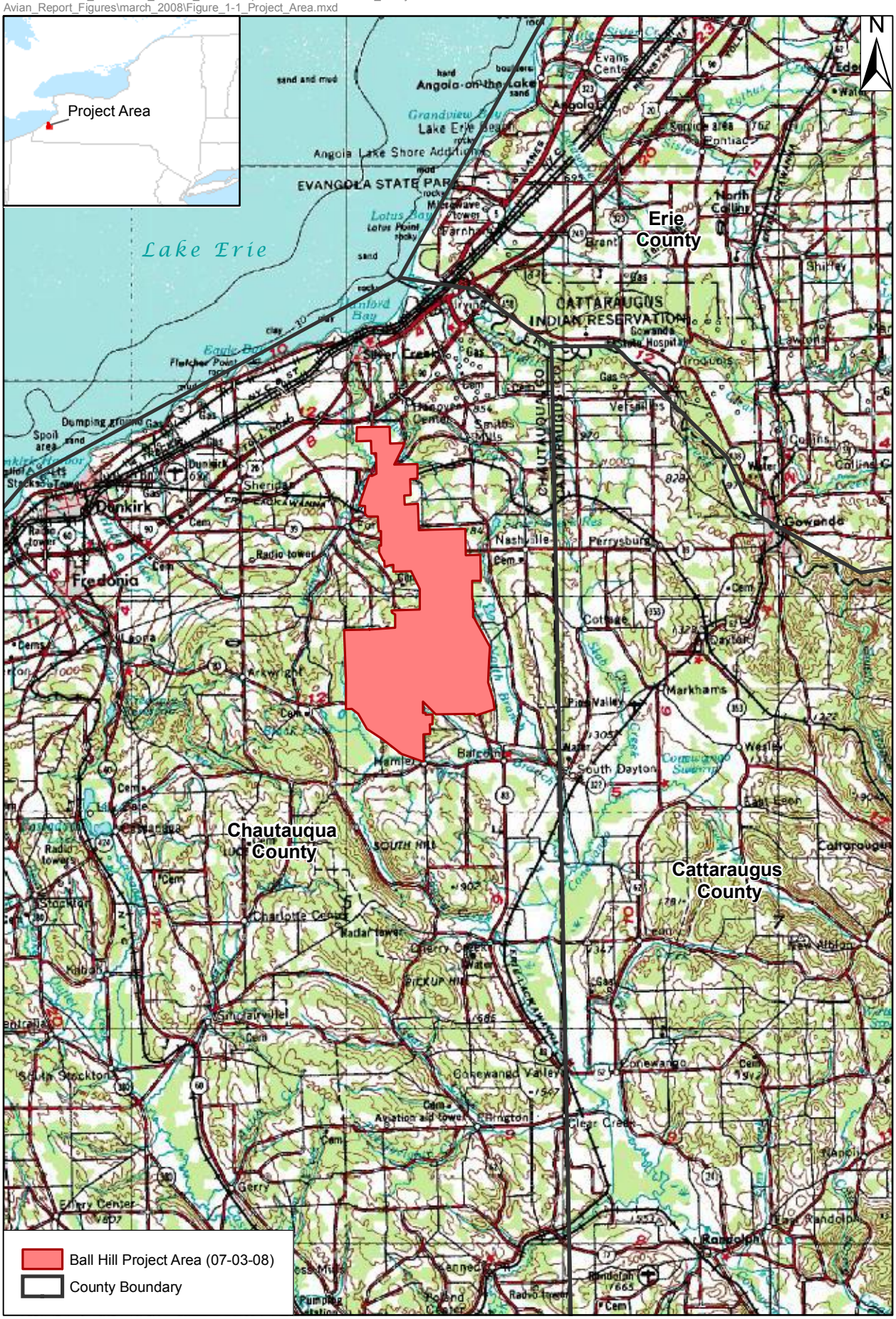


*Source: USGS 1:250,000 Topographic Map Quadrangles: Buffalo, 1967.*

**Figure 1-1 General Project Location**
**Noble Ball Hill Windpark**
**Towns of Villenova and Hanover,**
**Chautauqua County, New York**

3. Collect information on the occurrence of bat species in the Project Area during migratory seasons.

4. Analyze the baseline data and other available studies and data to evaluate the potential impacts to birds and bats from the Project.

The findings in this report are based on information obtained from the literature and site surveys, comparing data collected at this site with data collected at operating wind facilities at other locations, and by reviewing site features and geography with local bird and bat distribution and use (see Section 2 for methodology).

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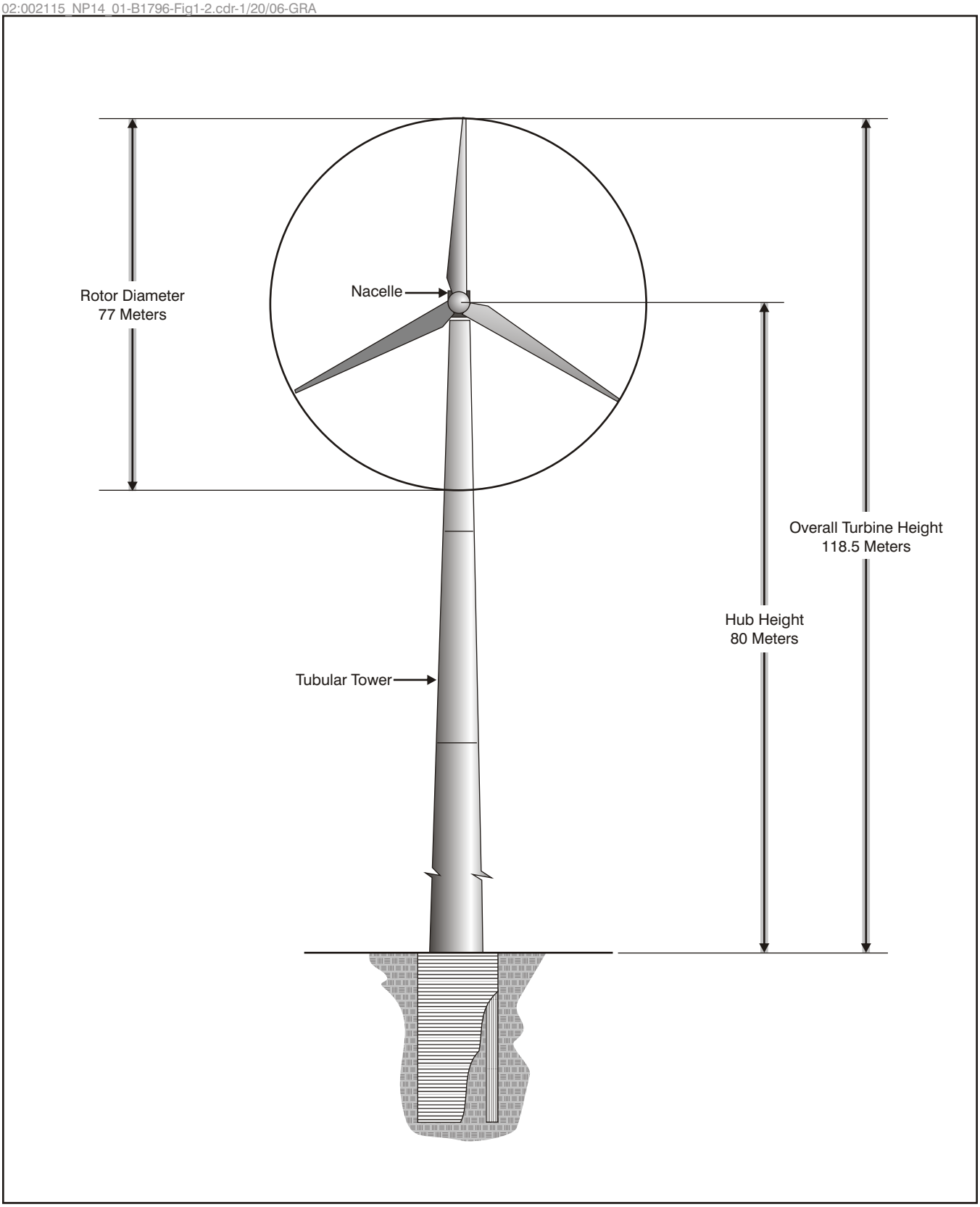


**Figure 1-2 Generalized Wind Turbine Layout**

# 2 Methodology

The methodology for this bird and bat risk assessment (BBRA) includes the following components:

- Performing a habitat assessment;
- Conducting a literature review and contacting agencies to gather background data for birds and bats in the Project Area;
- Conducting field studies; and
- Evaluating the potential impacts to birds and bats from the Project.

The methodology is consistent with the Work Plan for Bird and Bat Studies at Two Proposed Windparks: Noble Arkwright Windpark and Noble Ball Hill Windpark, Chautauqua County, New York (E & E 2006a) that was submitted to the New York State Department of Environmental Conservation (NYSDEC) and the United States Fish and Wildlife Service (USFWS) for review in September 2006. The work plan included studies that were consistent with bird and bat studies that Noble had conducted for other proposed windparks prior to September 2006 and that NYSDEC and USFWS were familiar with from the other sites. On April 4, 2008, Noble met with several NYSDEC staff to go over the status of each of the proposed and existing Noble windparks in New York State. During this meeting, the bird and bat studies at the Ball Hill site, including general results, were described as well as plans to conduct additional raptor surveys, spring migratory surveys, and breeding bird surveys in 2008 to bring the number of surveys to closely match those proposed in the NYSDEC Draft Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects (Draft Guidelines) (NYSDEC 2007a).

## 2.1 Habitat Assessment

The habitat and topography of the Project Area were evaluated based on site visits, interpretation of aerial photography, and through United States Geological Survey (USGS) land use and land cover figures. The general description devel-

oped is useful to understand the existing environment for birds and bats. See the DEIS for more detailed information.

## 2.2 Literature Review

A literature review was conducted to obtain existing information about the occurrence and distribution of birds and bats in the Project Area. Sources of bird information that were reviewed included the New York State Breeding Bird Atlas (BBA) project, USGS breeding bird surveys (BBS), National Audubon Society Christmas Bird Counts (CBCs), regional publications and records databases, the Audubon New York Important Bird Areas program, and bird and bat studies conducted for other proposed wind projects in the vicinity of the Project Area. Sources of bat information that were reviewed include publications of the NYSDEC, the USFWS, Bat Conservation International (BCI), and other reference sources. In addition to conducting a literature review, requests were made to NYSDEC and USFWS for information on threatened and endangered species in the Project Area.

## 2.3 Field Studies

### 2.3.1 Nocturnal Radar and Visual Study

An on-site marine radar was used to assess migratory bird and bat activity in the Project Area during the spring and fall migration periods. The radar study of bird and bat movements provided site-specific information on passage rates, behavior, and flight altitudes. Woodlot Alternatives, Inc. (Woodlot), now Stantec Consulting, conducted the nocturnal radar and visual study through coordination with E & E (see Appendix A and Appendix B).

One radar unit, located in the Town of Villenova, was used to conduct sampling during a 45–night period during the fall migration season (September 1 through October 15, 2006). The sampling location was selected in the field during a tour of the Project Area (see Figures 2-1 and 2-2). The site provided a relatively unobstructed view of the surrounding area; however, views to the southwest were somewhat obstructed by a forested edge. The radar lab consisted of a marine radar, a Furuno 1525 MKIII radar unit with a 6.5-foot antenna, mounted on a vehicle. The radar was X-band, transmitting at 9,410 megaHertz (MHz) with peak power output of 12 kilowatts (kW). A similar radar lab is described in Cooper et al. (1991) and the vertical radar setup is described by Harmata et al. (1999). Rain can interfere with marine radar's detection of small targets; therefore, efforts were focused on clear nights and nights without prolonged periods of rain.

Each night, Woodlot conducted nocturnal radar and visual observations at the survey site. Sampling began at sunset and concluded at sunrise as per the recommendation of NYSDEC. Samples of the radar display unit were permanently recorded by computer during each hour of operation. Each of the 60-minute nocturnal radar sampling periods consisted of: 15 one-minute sessions with the radar in surveillance (i.e., horizontal) mode at 1.4-kilometer (km)-range collecting

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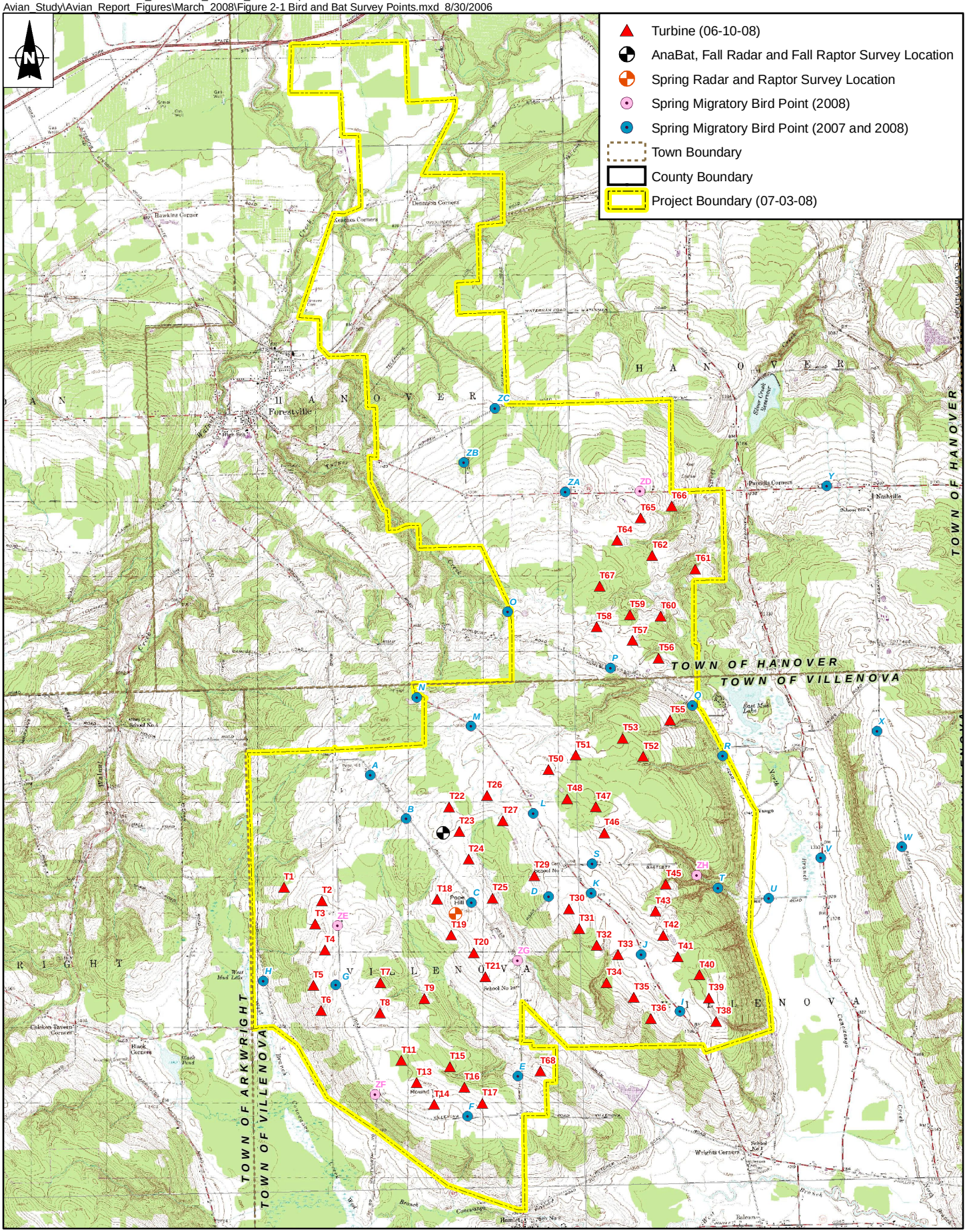
\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\
Avian_Study\Avian_Report_Figures\March_2008\Figure 2-1 Bird and Bat Survey Points.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Figure 2-1 Bird and Bat Survey Points (Part 1)**
**Ball Hill Project Area**

0 0.5 1 2
Miles

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\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\
Avian_Study\Avian_Report_Figures\March_2008\Figure 2-2 Bird and Bat Survey Points Pt 2.mxd 8/30/2006

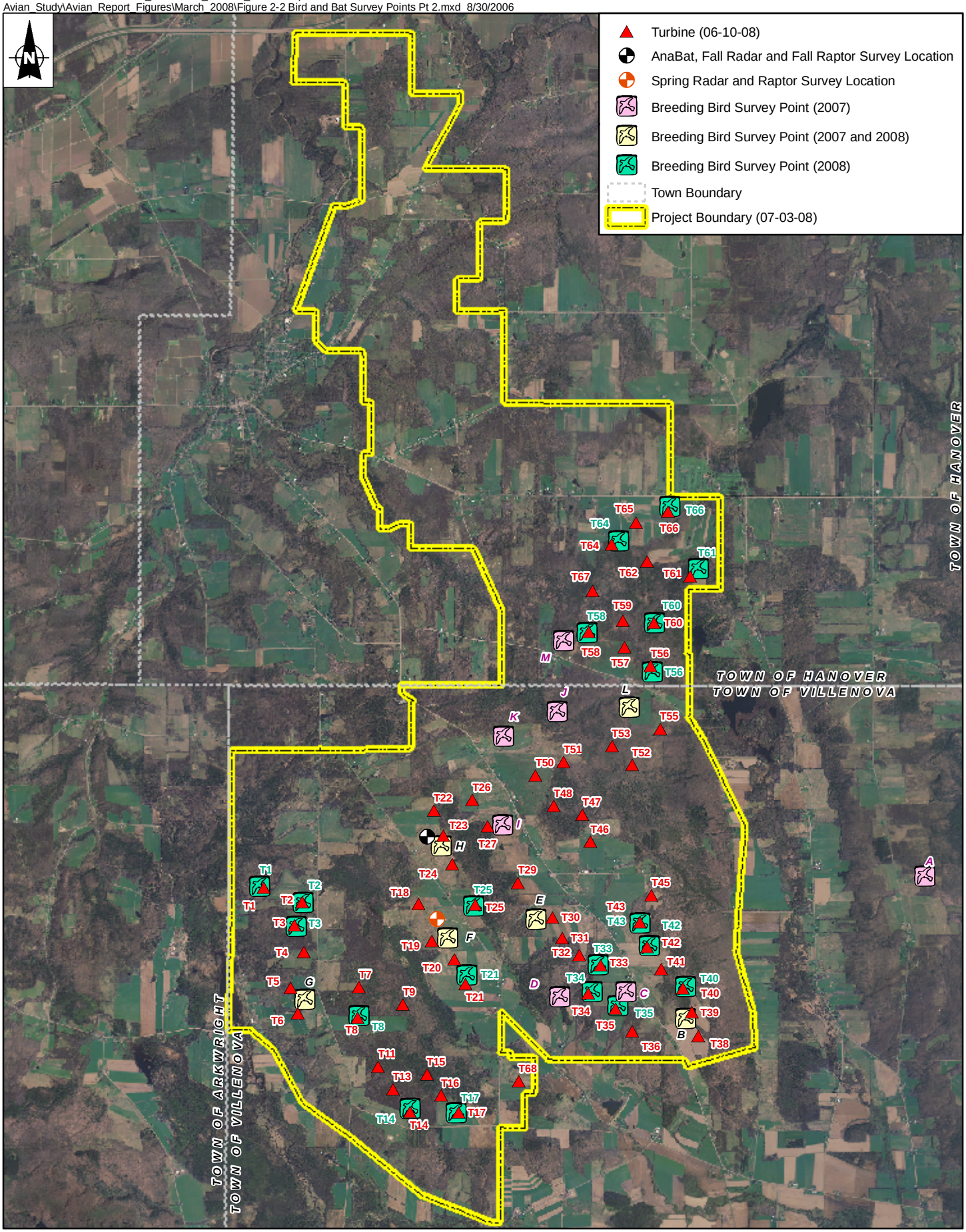


**Figure 2-2 Bird and Bat Survey Points (Part 2)**
**Ball Hill Project Area**

information on passage rates of nocturnal targets, ground speed, and flight direction; and 10 one-minute sessions in the vertical mode at 1.4-km-range to collect information on flight altitudes of nocturnal targets below 1,500 meters (4,921 feet). The rest of the 60 minutes was used to collect weather data, adjust the radar for the different modes, and to conduct visual surveys. The following weather data were collected at the beginning of each hour session: wind speed, wind direction, cloud cover, ceiling height, visibility, precipitation, and air temperature (degrees Celsius).

Video samples were analyzed using a digital analysis software tool developed by Woodlot. For horizontal samples, insects were removed from analysis based on their speed. The software tool recorded the time, location, and flight vector for each target on the video traveling fast enough to be a bird or bat and exported the data to a spreadsheet. The speed of targets included in the analysis was corrected for wind speed and direction. For vertical samples, the software tool recorded the entry point of targets passing through the vertical radar beam, the time, and flight altitude above the radar location and exported the data to a spreadsheet. These datasets were used to calculate passage rate reported as targets per km of migratory front per hour (targets/km/hr), flight direction, and flight altitude of targets. Also calculated was the mean target flight direction. Finally, the mean flight altitude was summarized (± 1 standard error) by hour, night, and overall season. The percentage of targets flying below 120 meters (394 feet) (slightly higher than the maximum height [118.5 meters] of the proposed wind turbines) was also calculated hourly, for each night, and for the entire survey period.

Visual sampling was conducted by directing a one-million candlepower spotlight vertically into the sky for five minutes. The observer identified low-flying targets (i.e., birds versus bats) and assessed insect activity levels. During night-vision sampling, the observer was stationed near the radar sampling station. For each session, the observer recorded the number of birds, bats, and insects that were observed flying through the beam up to approximately 120 meters (394 feet) above ground level (agl). The information was used during data analysis to help characterize the activity of birds, bats, and insects. On cloud free nights when the moon was full, a moon-watch technique was used instead of the spotlight technique. The moon watch technique involved training a pair of binoculars at the full moon and counting the number of migrants observed over a five-minute period.

The results of the fall nocturnal radar and visual study include:

- Baseline information on flight altitude, passage rates, and flight direction of migratory birds and bats;

- An estimate of the percentage of birds and bats that flew below a height of 120 meters (394 feet);

- An estimate of the relative proportions of birds vs. bats within 120 meters (394 feet) agl (based on visual estimates); and

- The amount of among-night and within-night variation in passage rates and flight altitudes of nocturnal targets (bats/birds).

A nocturnal radar study was also conducted during the spring migratory period from April 15 to May 31, 2007. The same mobile marine radar and visual techniques were employed to assess migratory bird and bat activity in the Project Area as during the fall study period; however, the radar location was changed for the spring survey because of property access issues (see Figures 2-1 and 2-2 for the spring radar location). The location of the radar for the spring survey was less than one mile south of the location for the fall radar survey.

For more complete information on the radar study methodology, see Woodlot's fall and spring reports in Appendices A and B of this report.

### 2.3.2 Migratory Raptor Surveys

Migratory raptor surveys were conducted in the Project Area for three days during the fall 2006 migratory season and three days during the spring 2007 raptor migratory season. The duration of the surveys (i.e., minimum of three days per season) was consistent with the request from NYSDEC for other proposed Noble projects in New York State in 2005 that a minimum of three days of raptor surveys be undertaken for proposed wind project areas both in the spring and fall migratory periods. Six additional surveys were conducted during the spring 2008 raptor migratory season. The additional surveys were conducted to be more consistent with the NYSDEC Draft Guidelines. The guidelines recommend 10 surveys during the predicted peak migration times for targeted species. For this project a total of nine spring migratory raptor surveys were conducted over the two years of study. Raptor migration areas in New York State are well documented (see further discussion in Section 3.2.1.1) and the Project Area is not located in an area known to have increased raptor migration.

The same protocol was used for both the spring and the fall surveys; however, the raptor sampling location was changed after the fall 2006 surveys because of property access issues. The sampling locations were selected during a field visit. With an agreeable land owner, a good view of the surrounding area, and proximity to the assumed turbine locations, the meteorological (met) tower site was selected as the sampling location in the fall 2006 (see Figure 2-1). Another field was selected in the spring 2007 that also had an agreeable land owner, a good view of the surrounding area, and proximity to the assumed turbine locations (see Figure 2-1). Spring 2008 surveys were conducted at the same location as the spring 2007 surveys. The spring survey location was located less than one mile south of the fall sampling location. The fall raptor location was 1,657 feet (505 meters) above mean sea level (amsl), and the spring raptor location was 1,654 feet (504 meters) amsl.

Field data collected on migrating raptors included species identification, number of individuals, flight direction, and estimated flight altitude (above or below 400 feet agl). Birds that were observed flying in a non-northerly direction during fall migration (or flying in a non-southerly direction during spring migration) were assumed to be migrating; whereas, birds observed flying north in fall (or south in spring) or hunting near the ground were considered to be local birds. The surveys were conducted between 9:00 a.m. and 4:00 p.m. on days of preferable raptor migration weather to the extent possible. Scheduling of surveys in the fall was attempted for days following the passage of cold fronts and/or the presence of light or northerly winds, with little or no precipitation. Favorable weather conditions in spring include little or no precipitation, warmer than average temperatures, and light or southerly winds.

Migratory raptor surveys were conducted on three days (21 hours) in the fall (September 15, October 5, and November 1, 2006), three days (21 hours) in the spring of 2007 (April 22, 23, and 30), and six days (42 hours) in the spring of 2008 (March 30, April 7, 15, and 24, and May 6 and 13) in the Project Area.

### 2.3.3 Spring Migratory Bird Surveys

E & E conducted two baseline migratory bird surveys in the Project Area during the spring (migratory) season in both 2007 and 2008. Surveys in spring 2007 were conducted on May 11 and 22, 2007 as per the work plan. Since the permitting schedule overlapped an additional spring, two additional surveys were conducted in spring 2008. The 2008 surveys were conducted on May 6 and May 16, 2008.

Twenty-eight sampling points (points A through ZC) were selected prior to field activities in 2007 based on the assumed turbine locations, viewing distances, a variety of habitats (agricultural [row crops], grassland [hayfield or pasture], reverting field [scrub habitat], and forest), and areas suited for avian occurrence (see Figure 2-1). Since the project area and turbine layout changed from the time of the 2007 surveys, the sampling points were revised prior to the 2008 surveys to better reflect the current Project Area and layout. In 2008, 33 sampling points (points A through ZH) were surveyed. The same 28 points (A through ZC) surveyed in 2007 were surveyed again, while five new points (ZD through ZH) were added in 2008. In both years the observer documented all birds (except the unprotected Rock Pigeon, European Starling, and House Sparrow) identified by sight or sound in 5-minute periods at each survey point. Because avian activity is greatest in the morning, the surveys were conducted during the morning hours from near sunrise until 11 a.m. To maximize the number of points visited during the morning hours, these surveys were conducted along roadsides.

The effort also included conducting reconnaissance surveys to document bird species and searching for threatened and endangered species and appropriate habitat. Following the point surveys, field observers drove the Project Area looking for

possible threatened and endangered species or habitat. If habitat was found, visual surveys and passive listening were conducted.

These surveys supplement the information collected in the spring radar study, especially with regard to species identification. Data from these surveys were used to document the occurrence and distribution of bird species in the Project Area and help identify the presence/absence of listed species and areas of higher/lesser bird activity.

### 2.3.4 Breeding Bird Surveys

Breeding bird surveys were conducted in the Project Area during the primary breeding season. Two surveys were conducted on June 11 and 26, 2007, and an additional survey spanning two days was conducted on June 11 and 12, 2008. In 2007, the same 13 survey points were visited on two separate occasions, while in 2008, 26 different survey points were visited over two consecutive days, but the survey was not repeated. Six of the points (points B, E, F, G, H, and L) surveyed in 2007 were also surveyed in 2008. All surveys were performed using USGS Breeding Bird Survey techniques with an observer recording all birds identified by sight or sound in set periods at each survey point (USGS 2007). For the 2007 surveys, 3-minute periods were surveyed at each point as per the work plan. For the 2008 surveys, 5-minute periods were used. Survey points were selected in consultation with Noble based on assumed turbine locations, accessibility, and a variety of habitats (agricultural [row crops], grassland [hayfield or pasture], reverting field [scrub habitat], and forest) (see Figure 2-2). All surveys were conducted from near sunrise until 11 a.m. In 2007, the observer walked to the assumed turbine locations (e.g., near hill tops), as a turbine layout has not been developed, to conduct the point counts. In 2008, the observer went to the survey points based on proposed turbine locations, with the assistance of a global positioning system (GPS) unit. Species observed during other site visits and surveys in the Project Area were also documented as was breeding behavior.

Similar to the migratory surveys effort, reconnaissance surveys and targeted searches for threatened and endangered species and appropriate habitat were conducted following the point surveys. If habitat was found, visual surveys and passive listening were conducted.

Data from these surveys were used to document the occurrence and distribution of breeding bird species in the Project Area and help identify the presence/absence of listed species and areas of higher/lesser bird activity.

### 2.3.5 Bat Habitat Surveys

E & E conducted initial habitat-level surveys during various visits to the Project Area in the fall 2006, spring 2007, and spring 2008 to determine if any habitat within the Project Area is suitable for bat species, particularly habitats required for endangered and threatened species. Habitats were documented based on species composition and general landscape position with particular emphasis placed on

forested riparian, floodplain, and wetland areas, which tend to be preferable roost and foraging locations for the endangered Indiana Bat. These areas were assessed through a combination of aerial and topographic map interpretation and site visits during migration and summer roosting periods. The survey assessed the potential for bat species to frequently utilize the Project Area. Rock outcroppings, potential dwellings, or other hibernacula where bats may roost were examined from field visits and desktop level of reviews for the surrounding region.

### 2.3.6 Acoustical Monitoring for Bats

Acoustical monitoring via bat echolocation detectors (i.e., AnaBat equipment) was conducted during the spring migratory period (March 28 through May 30, 2007) and the fall migratory period (July 30 through October 14, 2007). AnaBat monitoring equipment was installed on a met tower located in the Project Area (see Figures 2-1 and 2-2). In the spring, one monitoring unit was installed as high on the tower as possible at approximately 132 feet (40 meters) agl, while the other unit was installed midway between that unit and the ground at approximately 66 feet (20 meters) agl. In the fall, the detectors were mounted at the same heights on the same met tower. The monitoring units were deployed within a guy wire system and pointed in the direction of anticipated migration (facing south in spring and north in fall). Bat echolocation data was recorded digitally and analyzed for species or species-group identification. The acoustical monitoring study was conducted by Woodlot with project coordination provided by E & E. Woodlot's spring and fall reports are attached in Appendices B and C.

AnaBat detectors were used for the duration of this study. AnaBat detectors are frequency-division detectors, dividing the frequency of ultrasonic calls made by bats so that they are audible to humans. Frequency division detectors were selected based upon their widespread use for this type of survey, their ability to be deployed for long periods of time, and their ability to detect a broad range of frequencies, which allows detection of all species of bats that could occur in New York State. Data from the AnaBat detectors were logged onto compact flash media using a CF ZCAIM (Titley Electronics Proprietary Limited) and downloaded to a computer for analysis. Detectors were programmed to record data from 7:00 p.m. to 7:00 a.m. every night.

Call files were extracted from data files using CFCread© software, with default settings in place. Call files were visually screened to remove files caused by wind, insect noise, and other static so that only bat calls remain. Call files were examined visually and assigned to species categories, when possible, based on comparison to libraries of known bat reference calls. The categorization of calls was possible only when clear calls were recorded and only with certain species. Due to similarity of call signatures between several species, all classified calls were categorized to the lowest possible taxonomic level and then were grouped into one of four guilds established by Gannon et al. (2003) described in Woodlot (2008 a, b):

- **Big Brown, Silver-haired, and Hoary Bats.** This guild is also referred to as the big brown guild. These species' call signatures commonly overlap and have, therefore, been included as one guild in this report;

- **Eastern Red Bat and Eastern Pipistrelle.** Eastern Red Bats and Eastern Pipistrelles are included in this guild. Like so many other northeastern bats, these two species can produce calls distinctive only to each species. However, significant overlap in the call pulse shape, frequency range, and slope can also occur;

- **Myotid.** Bats of the genus *Myotis*. While there are some general characteristics believed to be distinctive for several of the species in this genus, these characteristics do not occur consistently enough for any one species to be relied upon at all times when using AnaBat recordings; and

- **Unknown.** Call sequences with too few pulses (less than five) or of poor quality such as indistinct pulse characteristics or background static. These calls were further classified as with high frequency (calls above 35 kilohertz [kHz] or low frequency (calls below 35 kHz) calls, which may provide information about the bats in the area.

Grouping calls in this way is considered a conservative approach to bat call identification.

Once the data were classified, nightly tallies of detected calls were compiled for each detector and each night. Detection rates indicate only the number of calls detected and do not necessarily reflect the number of individual bats in an area, because a single individual can produce one or many call files recorded by the bat detector, and the bat detector cannot differentiate between individuals of the same species. Call rates by species, guild, as well as total detections and trends in species' presence in the data set were reported. Comparisons between call rates and species composition were also made between the detectors.

For more complete information on the acoustical monitoring study methodology, see Woodlot's spring and fall reports in Appendices B and C.

# 3 Results

## 3.1 Habitat and Topography Description

The Windpark is located within an area of approximately 13,658 acres in the Towns of Villenova and Hanover in Chautauqua County, New York. Land uses within the Project Area are predominantly a mixture of forested and agricultural land, with the remaining acreage consisting of wetlands, residential areas and roads and other paved surfaces. Additionally, there are approximately 250 acres of NYSDEC mapped wetlands and 220 acres of National Wetland Inventory (NWI) mapped wetlands, within the Project Area. Current agricultural use includes a mixture of row crops (e.g., corn), hay production, and pasture. There are also a few scattered vineyards within the Project Area. Forested land within the Project Area varies from successional northern hardwood forest to more mature forested communities: beech-maple mesic forest and hemlock northern hardwood forest. Current and historic silviculture is evident throughout the Project Area.

The Project Area is located in the Appalachian Uplands physiographic province, adjacent to the boundary with the Central (Erie/Ontario) Lowland Physiographic Province. The topography predominately consists of rolling hills and hummocky areas. Within the Project Area, elevations range from 787 feet to 1,740 feet amsl. The bedrock geology in the project area is predominately horizontal beds of shale under glacial deposits.

The Project Area is characterized by deciduous and some mixed forest and agricultural fields (pasture/hay, row crops). There are also many reverting fields in several stages of succession (old field, shrubland, and young forest), scattered residential uses, and wetlands/open water. Agriculture within the Project Area consists of a mixture of hay production, pasture, and row cropping. Vineyards are also scattered throughout the northern portion of the Project Area. The forested communities throughout the Project Area include a mixture of beech-maple forest, hemlock-northern hardwood, and successional northern hardwood forest. Historically, timbering activities occurred throughout the area; however, current silvicultural practices, while witnessed, only took place in a few areas. Forest stands range from recently timbered to mature. The general population pattern in the area is rural residential, consisting of scattered residences along roads. Residential development within and adjacent to the Project Area is typical of rural areas,

with residences and farms clustered at crossroad hamlets, located on individual agricultural properties, or situated along state, county, and local roadways. Residential use in the Project Area is primarily active farmsteads.

The mosaic of uplands and wetlands within the Project Area offers a variety of habitats and ecozones beneficial to a broad wildlife assemblage. Numerous streams and ponds are also interspersed throughout the Project Area. Seven general ecological communities were identified in the Project Area: beech-maple mesic forest; hemlock northern hardwood forest; successional northern hardwood forest; successional shrubland; successional old field; vineyards/tree farms and agriculture (row crops, field crops, and pastureland). Seven general wetland communities were identified in the Project Area: deep emergent marsh, shallow emergent marsh, shrub swamp, hemlock-hardwood swamp, rich hemlock-hardwood peat swamp, red maple hardwood swamp, and artificial ponds. The community structure found within the Project Area is typical of other western New York areas with similar significant agricultural production, ranging from woodlots to old fields. Wildlife associated with these communities throughout the Project Area is typical of what would be found throughout much of western New York State. Please see Section 2.9 of the DEIS for more detailed information and a figure of ecological communities in the Project Area.

## 3.2 Literature Review

### 3.2.1 Birds

#### 3.2.1.1 Regional Avian Overview

This section discusses migration, breeding birds, and wintering birds in New York State. The dynamics of migration differs among groups of birds. Therefore, this section contains discussions on the migration of raptors, passerines, and waterbirds. The majority of passerines migrate during the night while raptors migrate almost exclusively during the day. Waterbirds migrate during the day and night (Richardson 1998).

**Migrating Birds (Spring and Fall)**

The primary bird migration seasons in the Project Area are spring and fall. Typical of New York State and the northeast United States in general, the migrations of certain bird groups are as follows:

- Raptors (e.g., hawks, falcons, eagles, and vultures) migrate primarily from mid-March through mid-May and then from September and early November. Some individuals migrate in the months just outside of the durations indicated above;

- Passerines (i.e., songbirds) primarily migrate from mid-April through May and from late August through October. Some individuals migrate in the months just outside of the durations indicated above; and

- Waterbirds (e.g., waterfowl, herons, and shorebirds) migrate primarily between March and mid-May and then between September and mid-November. Some individuals migrate in the months just outside of the durations indicated above.

Raptor migration areas in New York State are well documented and locations where large numbers (thousands to tens of thousands) of migrating raptors occur are already known. There are 13 sites in New York State that regularly report results to the Hawk Migration Association of North America (HMANA) database (HawkCount 2007). Most of these prime raptor migration locations are along the Great Lakes (in spring) and in the lower Hudson Valley (in fall). In spring, raptor migration is concentrated along the southern shores of the Great Lakes as raptors avoid crossing large bodies of water. Migratory raptors are also found in concentrated numbers along prominent ridgelines. There is one raptor monitoring location (i.e., "hawk watch") in Chautauqua County in the Town of Ripley approximately 24 miles southwest of the Project Area, and there is one located near the Lake Erie shoreline in the Town of Hamburg, approximately 23 miles northwest of the Project Area, where thousands of raptors are tallied each spring (HawkCount 2007; Zalles and Bildstein 2000). As the Project Area is not immediately proximate to the shorelines of the Great Lakes, large bodies of water, or lengthy ridgelines, raptor migration in the Project Area is diffuse and without regularly occurring concentration points. There are no geographical or topographical features within the Project Area that attract or concentrate large numbers of migrating raptors. The closest is the Portage Escarpment which is located adjacent to the northwest portion of the Project Area. Raptors concentrate along the lake side of this escarpment as they migrate to their northern breeding areas. The concentration of raptors along the Portage Escarpment is greatest where the escarpment is closer to Lake Erie, such as near the Ripley Hawk Watch (approximately 2.5 miles from the shore). The Portage Escarpment is located approximately 7 miles from the shore in the vicinity of the Project Area.

Unlike most migrating raptors, migrating passerines (i.e., songbirds) do not generally avoid crossing large bodies of water or migrate in concentrated numbers along ridgelines. However, they do concentrate in stopover sites following nocturnal migration. These stopover sites are often along geographical or topographical features (i.e., shorelines of large lakes or oceans) or isolated patches of habitat. No features that would attract or concentrate migrating passerines in greater numbers than elsewhere in the region were identified in the vicinity of the Project Area. As such, passerine migration in the Project Area is typically diffuse over a broad front like most of New York State. Given the closest distance to Lake Erie of seven miles, the Project Area is not anticipated to have increased numbers of stopover migrants.

There are no large waterbodies or extensive wetlands with open water in the Project Area to attract significant numbers of waterbirds (i.e., waterfowl or shorebirds) during migration. Other than some small inland lakes and reservoirs (e.g.,

East Mud Lake, West Mud Lake, Silver Creek reservoir) that attract lesser numbers of migrant waterfowl in the general vicinity of the Project Area, Lake Flavia, a quarry reservoir in the Town of Dayton, approximately five miles east of the Project Area occasionally attracts large numbers of waterfowl as does Chautauqua Lake located 20 miles southwest. Lake Erie also attracts large numbers of migrant waterfowl, approximately seven miles from the Project Area at the closest point. There is no strong passage of waterbirds in the Project Area, primarily because the habitat in the Project Area is unsuitable for large numbers of birds and the lack of large water bodies in the Project Area.

### Breeding Birds (Late Spring and Summer)

Late spring and summer is the primary season for avian breeding in the Project Area. Breeding activity in and/or near the Project Area has been documented by several sources (see Sections 3.2.1.2 and 3.2.1.3) and E & E conducted breeding bird surveys in the Project Area in June 2007 and June 2008 (see Section 3.3.4). Typical for rural Chautauqua County, a moderate to good diversity of breeding species is associated with the area, primarily in the forested areas.

### Wintering Birds

Large concentrations of birds do not winter in the Project Area and diversity is low because of the harsh climate and lack of sufficient food sources. The Project Area is within a snow belt that receives considerable snowfall in the winter. Most species present in other seasons (e.g., warblers, flycatchers, and thrushes) migrate south for the winter, leaving only year-round species that are not seasonally displaced (e.g., Great Horned Owl, Pileated Woodpecker) and some species (e.g., American Tree Sparrow, Rough-legged Hawk) that travel south from more northern climates to winter in western New York. Regional CBC data provide an overview of species that would be anticipated to occur in the Project Area during the winter in appropriate habitat (see Section 3.2.1.4).

## 3.2.1.2 Breeding Bird Atlas Projects

The New York State BBA project was an extensive survey to determine the current distribution of breeding bird species in New York State. Volunteer birders recorded evidence of breeding bird species throughout the state within 5-km by 5-km blocks. The data provide evidence of breeding composition and, in general, quality of breeding habitat. Depending on the breeding evidence observed, species were classified as possible, probable, or confirmed breeders. The first atlas was conducted between 1980 and 1986 (Andrle and Carroll 1988). Surveys for the Atlas 2000 project (2000 through 2005) were recently completed, allowing a comparison to the results of the first atlas to see how the distribution of breeding birds has changed. Final data from the Atlas 2000 project and final data from the 1980 to 1986 Atlas project are available for review on NYSDEC's Atlas 2000 web site (http://www.dec.ny.gov/public/7312.html) and will soon be published in a book scheduled for release later in 2008 (NYSDEC 2008). A total of 76 species was considered the statewide goal for species diversity per block and then volun-

teers were encouraged to move on to other blocks. The statewide average was 71 species per block although it varied widely by region (Corwin 2008).

The Project Area is located within seven New York State BBA blocks (1569A, 1570A, 1570B, 1570C, 1570D, 1571C, and 1571D; see Figure 3-1). Only very limited portions of the Project Area overlap with BBA blocks 1569A and 1571D. Final data for the species totals in all seven blocks from the Atlas 2000 project are included in Table 3-1. Only two of the totals for these atlas blocks are greater than the target goal for coverage of 76 species, which may indicate limited species diversity; however, it is more likely a reflection of reduced observer effort or access in the blocks.

**Table 3-1 Total Species Identified in New York State Breeding Bird Atlas Blocks in the Project Area**

| Block | Species Total | Possible Breeders | Probable Breeders | Confirmed Breeders |
|---|---|---|---|---|
| 1569A | 68 | 13 | 42 | 13 |
| 1570A | 81 | 24 | 47 | 10 |
| 1570B | 71 | 23 | 28 | 20 |
| 1570C | 77 | 29 | 36 | 12 |
| 1570D | 73 | 17 | 40 | 16 |
| 1571C | 60 | 32 | 21 | 7 |
| 1571D | 70 | 24 | 27 | 19 |

Source: New York State Breeding Bird Atlas 2000.

A combined total of 109 species was identified in the seven atlas blocks; see Appendix D, Table D-1, for the species identified in each block. The species identified in these seven blocks are generally consistent with regularly occurring nesting species for the region.

Several state-listed species were included among the species documented in these blocks during the Atlas 2000 project. One state-threatened species, Northern Harrier, was documented. Northern Harrier was categorized as a possible breeder in block 1569A. Species of special concern documented in the atlas blocks included Cooper's Hawk (block 1569A), Northern Goshawk (block 1570B), Red-shouldered Hawk (block 1570A), and Horned Lark (block 1569A).

#### 3.2.1.3 Breeding Bird Surveys

BBSs are conducted annually by volunteers during the peak nesting season (June) as part of a long-running, widespread monitoring program implemented by the USGS. All birds heard or observed are documented using a specified protocol. Surveys are conducted for three minutes at 50 locations, one-half mile apart, starting 30 minutes before sunrise. The BBS data provide a valuable source of information on bird populations and trends over time in given areas, both locally and nationally.

There are four BBS routes (Cattaraugus, Randolph, Sheridan, and Nashville) where at least of portion of the route is within 10 miles of the Project Area (see Figure 3-2). The species identified on these BBSs (see Appendix D, Table D-2) are similar to those observed during the New York State BBA project and are generally consistent with regularly occurring nesting species for the region. Several state-listed species were included among the species documented in these BBSs. Table 3-2 includes the New York State-listed species that were identified at least once during the BBS between 1966 and 2007, the number of birds per route, and the last year they were detected (Sauer et al. 2008). As indicated on Table 3-2, all listed species that have been documented have been in low numbers. No federally listed species were identified during these surveys.

**Table 3-2 State-Listed Species Identified during Cattaraugus, Randolph, Sheridan, and Nashville BBSs**

| Common Name | Listed Species | Birds/Route (Last Year Recorded) | | | |
|---|---|---|---|---|---|
| | | Cattaraugus | Randolph | Sheridan | Nashville |
| American Bittern | SC | 0.22 (1999) | 0.03 (1982) | NR | 0.03 (1974) |
| Northern Harrier | T | NR | 0.16 (2007) | 0.09 (1988) | 0.09 (1997) |
| Sharp-shinned Hawk | SC | 0.09 (1989) | 0.05 (2007) | 0.06 (1990) | 0.06 (1999) |
| Cooper's Hawk | SC | 0.19 (2003) | 0.08 (2006) | NR | 0.09 (2003) |
| Northern Goshawk | SC | 0.03 (1987) | NR | NR | NR |
| Red-shouldered Hawk | SC | 0.19 (1987) | 0.57 (2007) | 0.19 (1980) | 0.21 (1974) |
| Upland Sandpiper | T | 0.03 (1973) | 0.14 (2000) | 1.28 (1989) | 0.32 (1991) |
| Red-headed Woodpecker | SC | NR | 0.14 (1974) | 0.09 (1987) | 0.21 (1978) |
| Horned Lark | SC | 0.13 (1973) | 1.08 (2005) | 0.06 (1980) | 0.47 (1986) |
| Sedge Wren | T | NR | NR | NR | 0.03 (1973) |
| Golden-winged Warbler | SC | NR | 0.05 (1972) | NR | 0.03 (1967) |
| Yellow-breasted Chat | SC | NR | NR | 0.03 (1975) | NR |
| Vesper Sparrow | SC | 1.22 (1978) | 0.92 (2002) | 0.16 (1982) | 0.85 (1991) |
| Grasshopper Sparrow | SC | 0.44 (1973) | 0.19 (1972) | 1.06 (1990) | 0.71 (1993) |
| Henslow's Sparrow | T | NR | 0.03 (1967) | 0.47 (1989) | 0.56 (1987) |

Source: Sauer et al. 2008

Key:
NR = Not recorded.
E = State-endangered.
T = State-threatened.
SC = State species of special concern.

The Cattaraugus BBS (#61056) is a west-to-east route from the Town of New Albion to the Town of Ellicottville 15 miles east in Cattaraugus County; this route is approximately 10 miles east of the Project Area. Numbers of species have ranged from 47 to 77 during the years when surveys have been conducted. A total of 123 species have been recorded over the duration of the Cattaraugus BBS, which was

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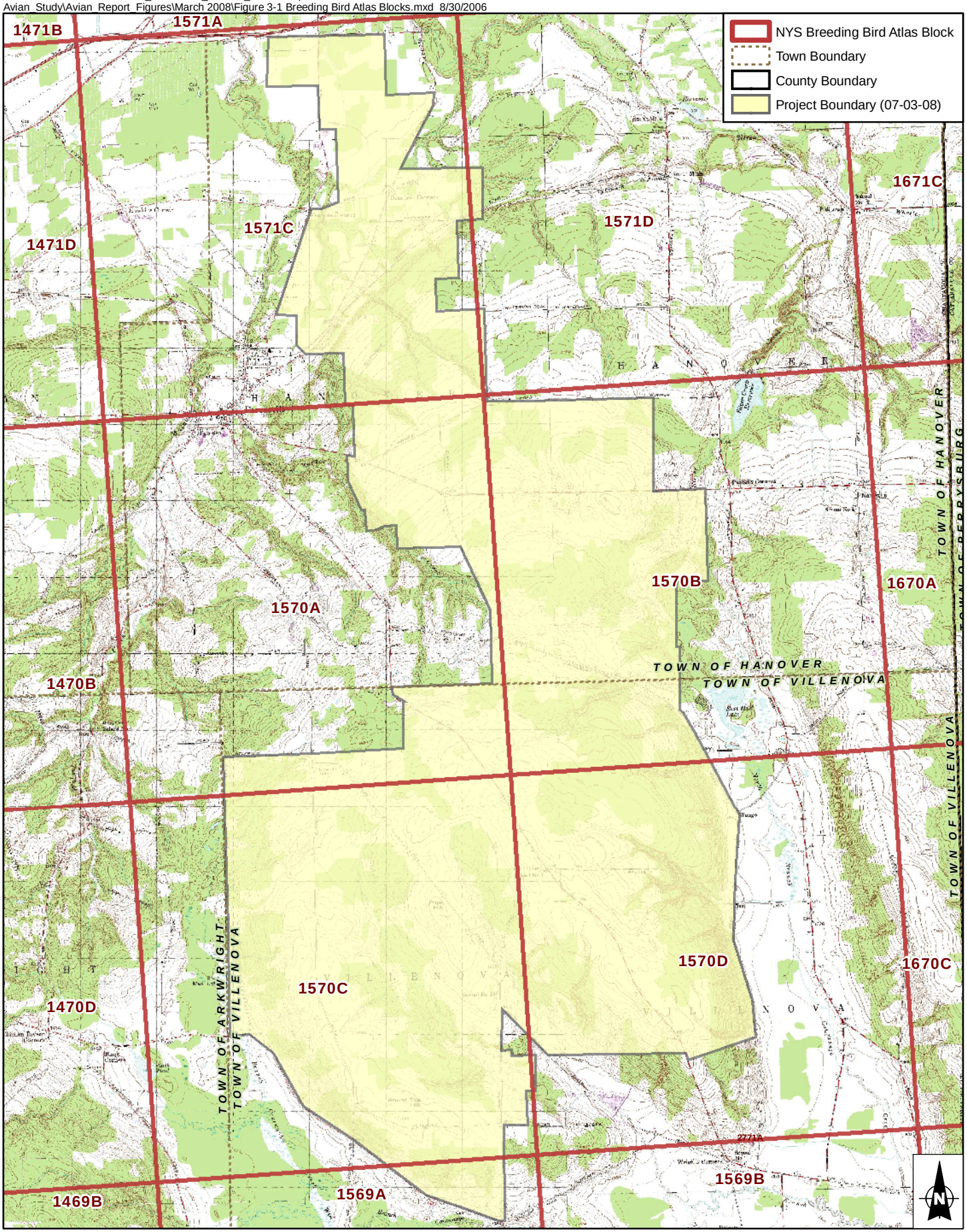
Avian_Study\Avian_Report_Figures\March 2008\Figure 3-1 Breeding Bird Atlas Blocks.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Figure 3-1 New York State (NYS) Breeding Bird Atlas Blocks**
**Ball Hill Project Area**

0 0.5 2
Miles

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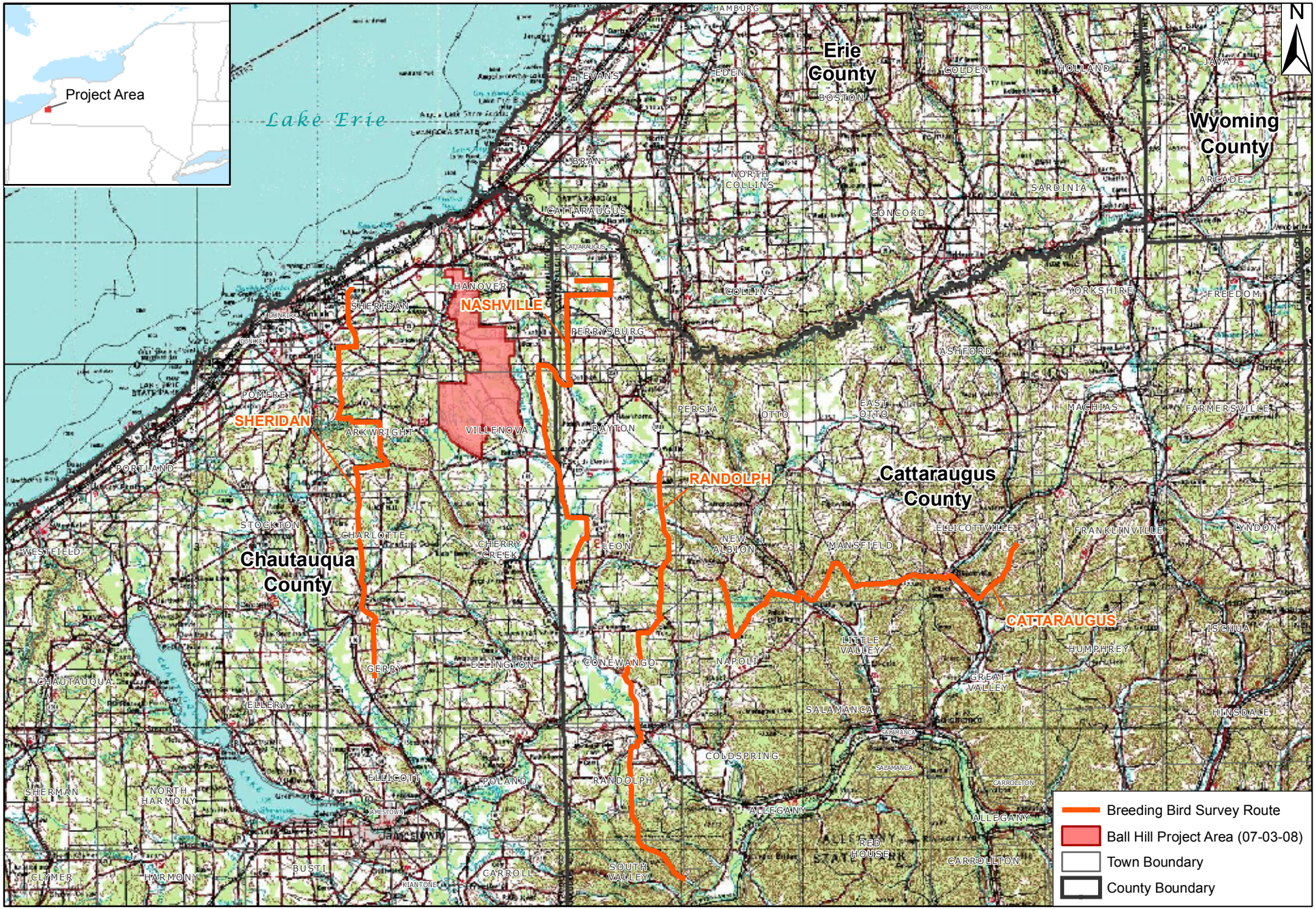


*Source: USGS 1:250,000 Topographic Map Quadrangles: Buffalo, 1967.*

**Figure 3-2 Breeding Bird Survey Routes Ball Hill Project Area**

0 2.5 5 10 Miles

conducted every year between 1967 and 2007 except 1967, 1976, 1977, and 1980 to 1982 (USGS 2007).

The Randolph BBS (#61059) is south-to-north route from the Town of Dayton, approximately 21 miles south to the Town of South Valley in Cattaraugus County. This route is approximately 5.5 miles southeast of the Project Area. Numbers of species have ranged from 58 to 76 during the years when surveys have been conducted. A total of 123 species have been recorded over the duration of the Randolph BBS, which was conducted every year between 1967 and 2007 except 1986 (USGS 2007).

The Sheridan BBS (#61061) is a north-to-south route from the Town of Sheridan to the Town of Gerry in Chautauqua County, 20 miles south. The BBS route is 2.5 miles west of the Project Area at its closest point. Numbers of species have ranged from 51 to 75 during the years when surveys have been conducted. A total of 111 species have been recorded over the duration of the Sheridan BBS, which was conducted every year between 1966 and 1998, no surveys were conducted from 1999 to 2007 (USGS 2007).

The Nashville BBS (#61063) is a north-to-south route, from the Town of Perrysburg to the Town of Leon, approximately 16 miles south. The route begins and ends in Cattaraugus County, but the middle portion is in Chautauqua County. This route crosses into the eastern portion of the Project Area. Numbers of species have ranged from 51 to 68 during the years when surveys have been conducted. A total of 111 species have been recorded over the duration of the Nashville BBS, which was conducted every year between 1967 and 2003 (USGS 2007). Surveys on this route have not been conducted since 2003.

#### 3.2.1.4 Christmas Bird Counts

The primary objective of the National Audubon Society's CBC is to monitor the status and distribution of wintering bird populations across the Western Hemisphere. The CBC is an all-day census of early winter bird populations within 15-mile diameter survey areas. The results are compiled into the longest running database in ornithology, representing over a century of continuous data on trends of early winter bird populations across the Americas (National Audubon Society 2005). The CBCs are conducted mostly by volunteer birders. The CBC data provide a good overview of the species that occur regionally in early winter in similar habitat. CBC data are available from a National Audubon Society web site (http://audubon2.org/birds/cbc/hr/count_table.html). Birds observed during CBCs conducted near the Project Area provide information on birds likely occurring in the Project Area during the winter months in similar habitat. However, past observations of bird species during the CBC do not mean that such species are currently present on or near the Project Area.

The closest CBC is the Dunkirk-Fredonia count. The Dunkirk-Fredonia CBC is centered approximately 3 miles southeast of the City of Fredonia, which is ap-

proximately 5 miles northwest of the Project Area. Given that a 15-mile diameter area is surveyed, the western half of the Project Area is included in this count. This CBC also includes areas along the shoreline of Lake Erie; as such, several of the species observed are considered coastal species and would not be observed within the Project Area.

The Dunkirk-Fredonia CBC was started in 1965. A total of 136 species have been identified on this CBC from December 1965 through December 2007 (36 years; surveys were not conducted from 1974 through 1980) (National Audubon Society 2008). The number of species counted each year ranged from a minimum of 27 species in 1968 to 83 species in 1989 for an average species count during that time period of 60 species. See Appendix D, Table D-3, for the data from the last 11 years of the Dunkirk-Fredonia CBC. Table 3-3 includes the New York State-listed species that were identified at least once during the Dunkirk-Fredonia CBC between 1965 and 2007 and the maximum count during that period (National Audubon Society 2008). No federally listed species were identified during this period.

**Table 3-3 State-Listed Species Recorded during Dunkirk-Fredonia Christmas Bird Count (1965 through 2007)**

| Common Name | New York State Status | Number of Years Observed Out of 36 Years | Maximum Count (Year[1]) |
|---|---|---|---|
| Common Loon | Special Concern | 7 | 2 (1965) |
| Pied-billed Grebe | Threatened | 32 | 9 (1997) |
| Osprey | Special Concern | 1 | 1 (2001) |
| Bald Eagle | Threatened | 2 | 1 (2006, 2007) |
| Northern Harrier | Threatened | 12 | 2 (1983, 1987, 1991) |
| Sharp-shinned Hawk | Special Concern | 30 | 6 (1993) |
| Cooper's Hawk | Special Concern | 27 | 6 (2005) |
| Northern Goshawk | Special Concern | 4 | 1 (1970, 1982, 1989) |
| Red-shouldered Hawk | Special Concern | 6 | 2 (1988, 1990) |
| Peregrine Falcon | Endangered | 2 | 1 (2006, 2007) |
| Short-eared Owl | Endangered | 5 | 4 (1982) |
| Red-headed Woodpecker | Special Concern | 2 | 1 (1970, 1996) |
| Horned Lark | Special Concern | 9 | 95 (1971) |
| Vesper Sparrow | Special Concern | 1 | 1 (1970) |

Source: National Audubon Society 2008.
[1] Year(s) that the maximum count was observed.

Another CBC that is nearby is the Jamestown count, which is centered in the City of Jamestown approximately 18.5 miles south of the Project Area. This CBC includes Chautauqua Lake; as such, several of the species observed are only found in larger water bodies and may not be observed within the Project Area. The Jamestown CBC was started in 1923. A total of 142 species have been identified

on this CBC from December 1923 through December 2007 (67 years; surveys were not conducted in 1927, 1928, 1931 to 1944, 1977, and 2002) (National Audubon Society 2008). The number of species counted each year ranged from a minimum of 14 species in 1930 to 82 species in 2006 for an average species count during that time period of 55 species. See Appendix D, Table D-4, for the data from the last 11 years of the Jamestown CBC. Table 3-4 includes the New York State-listed species that were identified at least once during the Jamestown CBC between 1923 and 2007 and the maximum count during that period (National Audubon Society 2008). No federally listed species were identified during this period.

**Table 3-4 State-Listed Species Recorded during Jamestown Christmas Bird Count (1923 through 2007)**

| Species | New York State Status | Number of Years Observed Out of 67 Years | Maximum Count (Year[1]) |
|---|---|---|---|
| Common Loon | Special Concern | 9 | 4 (1994) |
| Pied-billed Grebe | Threatened | 31 | 46 (1979) |
| Bald Eagle | Threatened | 15 | 7 (2006) |
| Northern Harrier | Threatened | 20 | 2 (1985, 1993, 1994, 1997, 1998, 2000, 2001) |
| Sharp-shinned Hawk | Special Concern | 49 | 8 (1993, 1996) |
| Cooper's Hawk | Special Concern | 52 | 9 (1997) |
| Northern Goshawk | Special Concern | 9 | 1 (1948, 1960, 1961, 1972, 1975, 1984, 1987, 1988, 1991) |
| Red-shouldered Hawk | Special Concern | 16 | 2 (1972, 1993, 1994, 1998, 2003-2005) |
| Short-eared Owl | Endangered | 7 | 3 (1925) |
| Red-headed Woodpecker | Special Concern | 6 | 2 (1956) |
| Horned Lark | Special Concern | 36 | 169 (1985) |
| Vesper Sparrow | Special Concern | 1 | 1 (1970) |

Source: National Audubon Society 2008.

Note:
[1] Year(s) that the maximum count was observed.

### 3.2.1.5 Regional Reports

E & E reviewed the Region 1, Niagara Frontier, quarterly reports in *The Kingbird*, a publication of the New York State Ornithological Association (NYSOA). NYSOA Region 1 includes Niagara, Erie, Chautauqua, Cattaraugus, Allegany, and the western portion of Wyoming, Genesee, and Orleans counties. All reports since 1998 were reviewed for bird sightings in the Towns of Villenova and Hanover.

The Buffalo Ornithological Society (BOS) maintains a database of avian records dating back to 1964 for NYSOA Region 1 and adjacent portions of Ontario. E & E reviewed the database for bird sightings in the Towns of Villenova and Hanover.

### 3.2.1.6 Important Bird Areas

The National Audubon Society has developed the Important Bird Area (IBA) program to identify a network of sites that provide critical habitat for birds. There are no IBAs as identified by Audubon New York within the Project Area. There are two IBAs, Wheeler's Gulf, and Dunkirk Harbor/Point Gratiot, within 10 miles of the Project Area; both are located in Chautauqua County. Portions of two other IBAs, Chautauqua Lake and Allegany Forest Tract, are within 20 miles of the Project Area (see Figure 3-3).

Wheeler's Gulf is located approximately 8 miles west of the Project Area in the Town of Pomfret in Chautauqua County. The 210-acre site is a beaver pond complex in a deep valley with mature forest on both sides. This site is mostly privately owned and supports a high diversity of bird species (Burger and Liner 2005). The IBA criteria for the site are met for one Audubon bird species at risk, Cerulean Warbler.

Dunkirk Harbor/Point Gratiot is a 755-acre area along the shoreline of Lake Erie approximately nine miles northwest from the Project Area in the Town of Dunkirk, Chautauqua County. Much of the area is corporately or privately owned. Because a power plant discharges warm water into the harbor, the area is free of ice in the winter, attracting numbers of waterfowl and other waterbirds. The site is also a known stopover site for migratory species. The IBA criteria for the site are met for one Audubon bird species at risk, Common Tern, plus there are large congregations of waterfowl, gulls, and individual species such as the Red-breasted Merganser. There are several state-listed bird species that occur at this site, including Common Loon (migrant) and Pied-billed Grebe (wintering). This site is also one of few locations in western New York with breeding Red-headed Woodpeckers, a state species of concern (Burger and Liner 2005).

Chautauqua Lake is 16 miles long and 2 miles wide and is located in multiple towns in Chautauqua County. The lake, which is approximately 16 miles south of the Project Area, is owned by New York State, and lakeshore ownership is private, municipal, and state (Burger and Liner 2005). This site is a stopover for migrant species, particularly waterfowl and shorebirds, including state-listed species such as the Common Loon, Pied-billed Grebe, Common Tern, and Black Tern.

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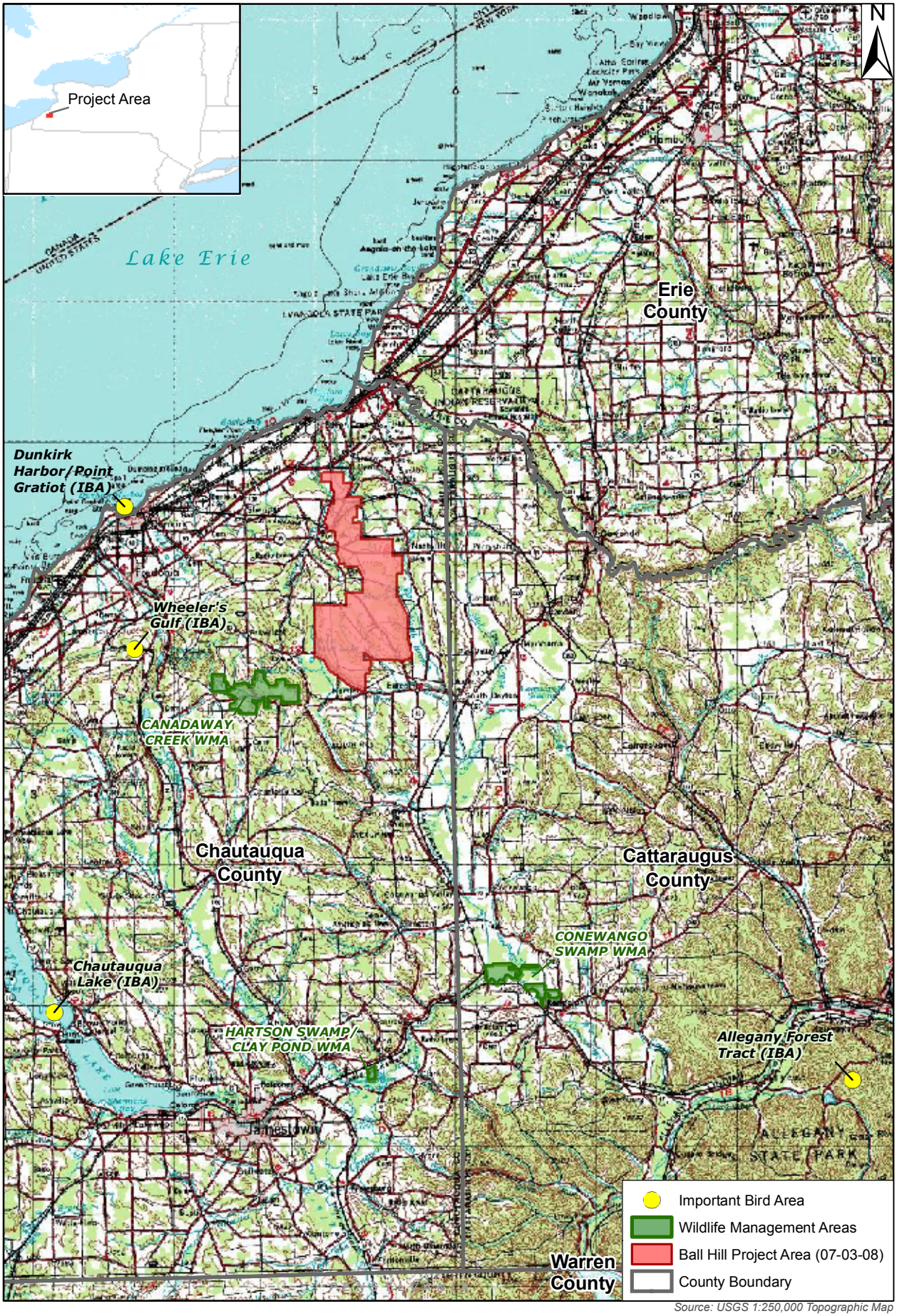


*Source: USGS 1:250,000 Topographic Map Quadrangles: Buffalo, 1967.*

**Figure 3-3 Important Bird Areas (IBAs) and Wildlife Management Areas (WMAs) in the Vicinity of the Ball Hill Project Area**

Allegany Forest Tract is located in multiple towns in Cattaraugus and Chautauqua counties and is located approximately 20 miles southeast of the Project Area. This 195,000-acre area includes Allegany State Park (approximately 65,000 acres). This area is primarily forested with Sugar Maple (*Acer saccharum*) mesic, oak, successional hardwood, evergreen northern hardwood, evergreen plantation, and deciduous wetland forests offering habitat for a diverse array of forest-bird species. The Allegany Reservoir is also located in the Allegany Forest Tract. Numerous state-listed bird species occur in this area, and the IBA criteria were met for over 25 species including the Bald Eagle (migrant) (Burger and Liner 2005). There have been four nesting pairs of Bald Eagles from 2000 to 2004 and a maximum of 25 eagles observed in winter at this site.

Although these IBAs contain habitats unique to the area and/or habitats that are not degraded or heavily impacted by humans (Burger and Liner 2005), none of these IBAs is proximate to the Project Area. Therefore, the IBAs are unlikely to be impacted by the Project.

#### 3.2.1.7 Other Protected Areas

There are no bird conservation areas (BCAs) within 20 miles of the Ball Hill Project Area at this time. There are four Wildlife Management Areas (WMAs) (Canadaway Creek, Conewango Swamp, Hartson Swamp, and Clay Pond) within 20 miles of the Project Area (NYSDEC 2007b).

Canadaway Creek WMA is located in the Town of Arkwright, Chautauqua County, three miles west of the Project Area. This WMA is 2,160 acres of hardwood forest interspersed with conifer plantations that are maintained for Ruffed Grouse habitat. Canadaway Creek WMA is managed largely to produce forest crops, maintain diverse wildlife habitat, and provide recreational opportunities.

Conewango Swamp WMA is a 900-acre area offering birdwatching, cross-country skiing, snowshoeing, hunting, fishing, and trapping. The WMA is primarily wetland habitat and is located near the Village of Randolph in Cattaraugus County, approximately 14 miles to the south of the Project Area.

Hartson Swamp/Clay Pond WMAs, have a combined total of 219 acres and are located in the Town of Pharsalia, Chautauqua County, approximately 17 miles south of the Project Area. These WMAs consist of wetland and upland complexes that offer birdwatching, cross-country skiing, snowshoeing, hunting, fishing and trapping.

#### 3.2.1.8 Recent Bird Studies in Proximity to the Project Area

A bird study was recently conducted in proximity to the Project Area as part of the permitting process for another proposed wind energy project (New Grange Wind Farm). A summary of the results from this bird study are included in this section.

The general project area for the proposed New Grange Wind Farm is identified on Figure 3-4.

### New Grange Wind Farm Study

New Grange Wind Farm LLC is pursuing development of a wind farm in the Town of Arkwright, Chautauqua County, New York. A DEIS was submitted in 2008 for the proposed 47-turbine wind farm (Kerns et al. 2008). This proposed wind farm is approximately one mile southwest of the Ball Hill Project Area (see Figure 3-4).

A nocturnal radar study was conducted in the spring and fall of 2007 as part of the permitting effort for the New Grange Wind Farm. Western EcoSystems Technology, Inc. (WEST) conducted the study between April 25 and June 8, 2007, and between August 16 and October 17, 2007. Mean passage rates when the radar was in the horizontal mode were 175.2 ± 20.5 targets/km/hr and 111.9 ± 6.0 targets/km/hr for the spring and fall surveys, respectively. When the radar was in the vertical mode, mean passage rates were 635.0 ± 30.1 targets/km/hr and 178.1 ± 7.0 targets/km/hr for the spring and fall surveys, respectively. The mean flight direction in the spring was 17.5 $^{o}$, while in the fall it was 207.8 $^{o}$. Mean flight altitudes were 449.9 ± 2.2 meters (1,476.0 ± 7.2 feet) and 457.9 ± 2.0 meters (1,502.3 ± 6.6 feet) above radar level (arl) for the spring and fall surveys, respectively. Approximately 13 percent of all nocturnal targets in the spring and 10 % of all nocturnal targets in the fall flew below an altitude of 125 meters (410 feet).

WEST conducted spring and fall raptor surveys in the New Grange Project Area in both 2005 and 2007. Spring surveys were conducted between April 16 and May 15 in 2005 and between April 27 and May 22 in 2007. In 2005, four fixed points were surveyed five times each for a total of 20 surveys, while in 2007 three fixed points were surveyed five times each for a total of 15 surveys. For both years combined, 98 individual raptors from seven species were observed during spring surveys. The migratory passage rate for the spring surveys was three raptors per observer hour. Fall surveys were conducted between September 17 and October 15 in 2005 and between September 21 and October 28 in 2007. In both 2005 and 2007 three fixed points were surveyed six times for a total of 18 surveys in each year. For both years combined, 212 individual raptors from eight species were observed during fall surveys. The migratory passage rate for the fall surveys was six raptors per observer hour. Red-tailed Hawk and Turkey Vulture were the two most prevalent species observed in both the spring and fall. One state listed threatened species (Northern Harrier) and three state special concern species (Cooper's Hawk, Sharp-shinned Hawk, and Red-shouldered Hawk) were documented. All state-listed species except for the Cooper's Hawk, which was only observed in the spring, were observed during both the spring and fall surveys.

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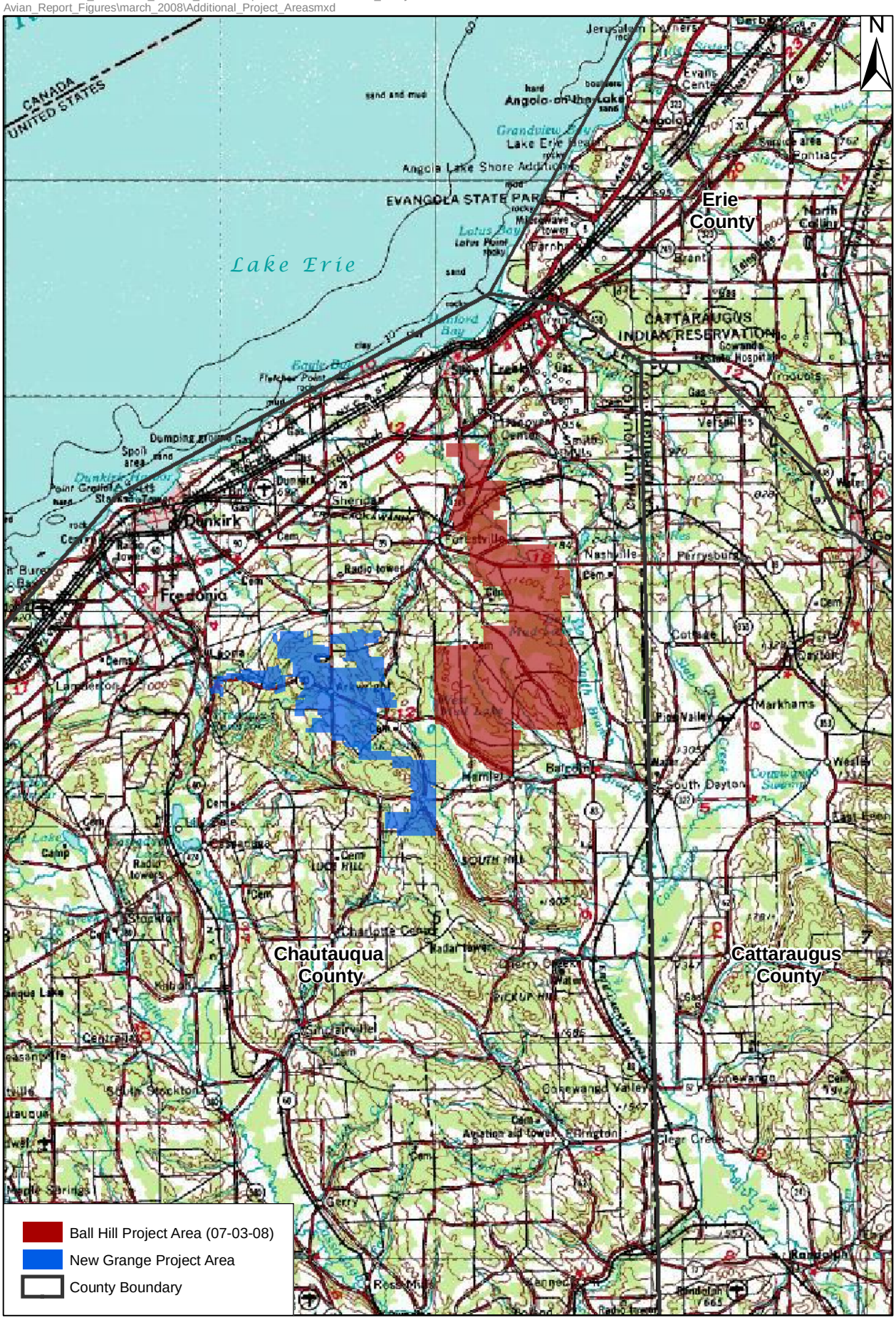


*Source: USGS 1:250,000 Topographic Map Quadrangles: Buffalo, 1967.*

**Figure 3-4 Recent Bird and Bat Study Project Area in Relation to Ball Hill Project Area**

A breeding bird survey over three consecutive days was conducted by WEST. The survey consisted of a 3-minute point count at each of the 30 survey points. Survey points were located on public roads and private lands and were selected to cover as much of the proposed development area as possible. Breeding bird surveys were conducted on June 21, 22, and 23, 2007. A total of 1,117 birds of 77 species were recorded during the survey. The most numerous species recorded were European Starling, Red-winged Blackbird, and American Crow. Species identified during these surveys were generally consistent with those expected for the geographic area. No threatened and endangered species were identified, but one state species of special concern, Sharp-shinned Hawk, was observed.

Kerns et al. (2008) concluded that the New Grange area was not a migration corridor for raptors, that nocturnal migration characteristics were similar to other studies conducted in the eastern U.S., that the Project Area did not support large or unusual populations of breeding resident birds, and that this project would not significantly impact state-listed bird species. Overall, the report concluded that impacts to birds from the New Grange project would be similar or less than other eastern wind projects studied.

### 3.2.2 Bats

#### 3.2.2.1 Regional Bat Overview

This section discusses general bat ecology and habitat preference for bat species found in New York State. Very limited information specific to the Project Area was identified during the literature review. Nine species of bats have been identified as potentially utilizing the various landscapes found in the State of New York (see Table 3-5). This section discusses general bat ecology and habitat preference for bat species found in New York State.

Habitats utilized by bats in New York include wetlands, agricultural and reverting fields, forests, and cities with a variety of micro-habitats used for foraging, roosting, and maternity roosting. Bats thrive in these various habitats as they are proficient predators of insect populations. Generally bats are solitary outside of mating, hibernation periods, and rearing of young, although some colonial roosting does occur. The most common species of bats (e.g., Little Brown Bat, Eastern Pipistrelle, Big Brown Bat, and Eastern Red Bat) have adapted to a multitude of habitat types including human-altered landscapes. As such, these species are assumed to utilize the Project Area. The remaining bat species tend to be found only in densely forested stands and are not expected to be found regularly in the Project Area, if at all.

**Table 3-5 Bat Species of New York, Preferred Habitats, and Abundance**

| Common Name | Scientific Name | Average Body Size (Inches) | Preferred Habitats | | Abundance |
|---|---|---|---|---|---|
| | | | Summer | Winter | |
| Big Brown Bat | *Eptesicus fuscus* | 3.4-5.4 | Tree cavities, exfoliating bark, urban structures | Regional hibernacula, buildings, urban structure | Common |
| Silver-haired Bat | *Lasionycteris noctivagans* | 3.6-4.6 | Tree cavities, exfoliating bark in coniferous forested stands, and rock crevices | Migrates outside region? | Uncommon (abundance uncertain) |
| Eastern Red Bat | *Lasiurus borealis* | 3.6-4.6 | Dense riparian tree foliage | Migrates outside region? | Uncommon (abundance uncertain in New York); most common tree roosting bat |
| Hoary Bat | *Lasiurus cinereus* | 5.1-5.9 | Tree foliage | Migrates outside region? | Uncommon (abundance uncertain) |
| Small-footed Myotis (SC) | *Myotis leibii* | 2.9-3.2 | Hemlock stands, rock crevices, tree bark, urban structures | Regional hibernacula, rock outcropping | Uncommon |
| Little Brown Bat | *Myotis lucifugus* | 2.4-4.0 | Tree cavities, urban structures | Regional hibernacula | Most common |
| Indiana Bat (E) | *Myotis sodalis* | 2.9-3.9 | Exfoliating bark, cavities, dead trees in riparian corridors | Regional hibernacula | Uncommon; federally endangered |
| Northern Myotis | *Myotis septentrionalis* | 3.2-3.8 | Tree cavities, exfoliating bark, barns, eves, shingles | Regional hibernacula | Uncommon to common |
| Eastern Pipistrelle | *Pipistrellus subflavus* | 3.0-3.6 | Tree foliage, leaf litter | Regional hibernacula | Uncommon to common |

Source: Curtis and Sullivan 2001, Williams et al. 2002, NYSDEC 2007b, Bat Conservation International 2007.

Note:
[1] State-endangered (E) and threatened (T) species and species of special concern (SC) are noted with parenthesis after the common name.

Specialized habitats required for bats include winter hibernacula, where bat species congregate during hibernation periods (November through March). Identified hibernacula include limestone caves, old mines, and old well shafts. Most bats require a moderated constant temperature and humidity provided by the hibernacula to survive over the winter. Measures have been taken by state and federal agencies in the last decade to protect important bat hibernacula habitats, as any disturbances during critical hibernation periods can be detrimental to large populations of bats, as well as individual bat species. Bats return in fall to established hibernacula. Some New York bats migrate relatively short distances to these hibernacula. Some bats winter in small hibernacula near their summer roosting areas, while other bats migrate farther south to warmer climates with shorter periods of hibernation and available foraging sources.

Summer roosts are generally daytime or nighttime roosts, where bats will spend the entire day resting and/or portions of the night resting. Daytime roosts for New York bats can vary and include buildings, exfoliating bark, tree cavities, rock piles, and caves depending on species-specific preferences. No roosting areas were identified in the Project Area during site visits or as indicated in the literature.

A mysterious illness, termed white-nose syndrome (WNS), has led to thousands of bat deaths in the northeastern United States since early 2007. First discovered near Albany, New York in February 2007, WNS has now been confirmed at over 25 caves and mines in New York, Vermont, Massachusetts, and Connecticut (USGS National Wildlife Health Center 2008). WNS may also be present in Pennsylvania, but has not yet been confirmed (USFWS 2008a). WNS has not been documented in western New York. Bats affected by WNS typically have a white fungus encircling their nose. It is currently unknown whether the fungus is the cause of WNS or whether it is simply an indicator of poor overall health. Bats affected by WNS are commonly emaciated and have little or no body fat. Affect bat species include the federally endangered Indiana Bat, Eastern Pipistrelle, Northern Long-eared Bat, Small-footed Bat, and Little Brown Bat. Little Brown Bats, the most common hibernating species in New York, have sustained the largest number of deaths (NYSDEC 2008).

#### 3.2.2.2 Recent Bat Studies in Proximity to the Project Area

A bat study was recently conducted in proximity to the Project Area as part of the permitting process for another proposed wind energy project (New Grange Wind Farm). A summary of the results from this bat study are included in this section, which provides some of the only local bat data from the region outside of that collected for this Project. The general project area for the proposed New Grange Wind Farm is identified on Figure 3-4.

### New Grange Wind Farm Study

Acoustical monitoring was conducted at the proposed New Grange Wind Farm in the Town of Arkwright, Chautauqua County, New York, in the spring, summer, and fall of 2007 (Kerns et al. 2008). This proposed wind farm is approximately one mile southwest of the Ball Hill Project Area (see Figure 3-4). Passive and active acoustical monitoring was conducted by WEST using AnaBat bat detectors to record the unique echolocation calls of bats. In spring 2007, two AnaBat detectors were used for passive sampling; one was located at the radar station used for nocturnal bird surveys, the other unit was placed at a met tower. Both units used in the spring were located approximately one meter agl. In summer and fall 2007, passive sampling was only conducted at the met tower. Three AnaBat units, located at approximately one meter, 25 meters, and 50 meters agl were used. Passive sampling in spring, summer, and fall was conducted between April 26 and June 7, 2007, June 8 and July 31, 2007, and August 1 and October 29, 2007, respectively. In addition to the passive sampling, active sampling using a handheld AnaBat unit was conducted to determine which bat species were present. Active sampling was conducted over three sampling periods of three consecutive nights each. Active sampling was conducted in the summer between June 20 and June 22, 2007, July 5 and July 7, 2007, and August 1 and August 3, 2007.

A total of 784 bat call sequences were recorded during the spring sampling period. More calls were recorded at the radar location (598 call sequences in 38 sampling days), which was located on a forest edge near a riparian area, than at the met station (186 call sequences in 34 sampling days). In the summer, a total of 254 call sequences were recorded. Most of the calls were recorded by the AnaBat unit located one meter agl (167 call sequences in 37 sampling days). Fifty-five call sequences were recorded by the 25 meter agl AnaBat unit in 35 sampling days, while 32 call sequences were recorded by the 50 meter agl AnaBat unit in 18 sampling days. In the fall, most of the call sequences were recorded by the one meter agl AnaBat unit (311 call sequences in 76 sampling days), however this unit had more than double the sampling days as the other two units. The 25 meter agl unit recorded 71 call sequences in 35 sampling days, while the 50 meter agl unit recorded 15 call sequences in 36 sampling days. The majority of calls detected during passive sampling were not able to be identified to species. Of the calls identified, Big Brown Bat was the most frequently detected species during both the spring and fall sampling periods. During the summer sampling period, *Myotis* spp. calls, likely representing resident Little Brown Bats, were the most frequently detected call sequences. Although infrequent, Eastern Red Bats were detected during all three sampling periods. Hoary Bats, although infrequent, were detected only in the spring and summer, while Eastern Pipistrelle was only detected during the fall sampling period (two call sequences).

During active sampling, 411 call sequences were recorded. Frequently detected species included Eastern Red Bat, Little Brown Bat, and Big Brown Bat. Hoary Bat was detected, but to a lesser extent then the other species. No Eastern Pipistrelle or Silver-haired Bat were detected, although the call of the Silver-haired Bat

is very similar to the Big Brown Bat and thus is difficult to differentiate. Calls of the Indiana Bat, Northern Myotis, and Small-footed Myotis are also difficult to differentiate and were grouped together into a *Myotis* spp. category.

Kerns et al. (2008) concluded, based on their sampling data and activity/mortality reported from other wind facilities, that mortality risks to bats would be lower at the New Grange project area than at other eastern wind facilities.

### 3.2.3 Threatened and Endangered Species (Birds and Bats)

Federally listed threatened and endangered plant and animal species are protected by the Endangered Species Act of 1973, which is administered by the USFWS. State-listed threatened and endangered plant and animal species are protected by the New York State Environmental Conservation Law, Article 9 and Article 11, which is administered by NYSDEC.

The USFWS and the NYSDEC Natural Heritage Program (NHP) were consulted to determine the potential occurrence of federally and state-listed endangered and threatened species and significant natural communities and habitats within the Project Area.

The USFWS and NHP provided data detailing the known occurrences of threatened, endangered, and species of special concern within the Project Area. Species of special concern are wildlife species found by NYSDEC to be at risk of becoming either endangered or threatened in New York State. Species of special concern do not qualify as either endangered or threatened at this time, as defined in Part 182.2(g) and 182.2(h) and are not subject to the provisions of Part 182. Species of special concern are listed in Part 182.6(c) for informational purposes only.

#### 3.2.3.1 NYSDEC Natural Heritage Program

In addition to the standard analysis of project areas for potential occurrences of threatened or endangered plant and animal species, the NHP has developed specific criteria for wind power projects. NHP now reports all records of avian species occurring within a 10-mile radius of identified project areas (Seoane 2006, 2008). Records of bat colonies and bat species of concern occurring within a 40-mile radius are also reported.

No listed bird or bat species were identified by NHP within the Project Area. Six bird species, the Great Blue Heron, Bald Eagle, Northern Harrier, Short-eared Owl, Sedge Wren, and Henslow's Sparrow, were identified by NHP within 10 miles of the Project Area, and one significant community, rich hemlock-hardwood peat swamp, was identified by NHP within the Project Area (Seoane 2008). In New York State, Short-eared Owl is considered an endangered species, while Bald Eagle, Northern Harrier, Sedge Wren, and Henslow's Sparrow are considered threatened species. The Great Blue Heron is protected by the federal Migratory Bird Treaty Act and was identified by NHP for this project because of the proximity of the Project Area to a rookery.

According to NHP, a Great Blue Heron rookery with more than 50 nests per year has been observed at Dibble Hill/Farrington Hollow in the Town of Arkwright, Chautauqua County, approximately 2 miles west of the Project Area. Bald Eagle nests have been located on the Cattaraugus Indian Reservation in Cattaraugus and Chautauqua counties approximately 8 miles north of the Project Area and at Conewango Swamp in the Town of Dayton, Cattaraugus County approximately 4.5 miles east of the Project Area. Northern Harrier has been observed in the towns of Dayton, Cattaraugus County approximately 4 miles east of the Project Area, and Leon, Cattaraugus County approximately 6 miles southeast of the Project Area. Short-eared Owls have been observed in fields by the Dunkirk Airport, likely during winter months, in the Town of Sheridan, Chautauqua County, approximately 8 miles northwest of the Project Area. Sedge Wren have been observed in the Towns of Sheridan and Pomfret, Chautauqua County, approximately eight 8 northwest and 10 miles west of the Project Area, respectively. Henslow's Sparrow have been observed in the Town of Arkwright, Chautauqua County, approximately 6 miles west of the Project Area.

Dates and seasonal occurrence of the identified bird species were not provided in the 2008 NHP letter. No bat colonies or species were identified within a 40-mile radius of the Project Area.

#### 3.2.3.2 USFWS

The USFWS has expressed concern pertaining to the potential for wind projects, in general, to impact migratory birds and threatened or endangered bat species (such as the Indiana Bat). The USFWS maintains a database of federally listed endangered and threatened and candidate species regarding known or likely occurrences by county. The database is available online at http://www.fws.gov/northeast/nyfo/es/esdesc.htm. The county-level list of federally listed animal species was reviewed for this project for updated threatened and endangered bird and bat species information. Although the Bald Eagle been observed in Chautauqua County (USFWS 2007a), it has been de-listed and is no longer protected by the Endangered Species Act (USFWS 2007c). While they are no longer protected by the Endangered Species Act, the Bald Eagle is still protected federally under the Bald and Golden Eagle Protection Act (USFWS 2008b). No federally designated or proposed "critical habitat" exists within the Project Area.

## 3.3 Field Studies

### 3.3.1 Nocturnal Radar Study

Woodlot conducted a nocturnal radar study between September 1 and October 15, 2006, and between April 15 and May 31, 2007, to analyze the nocturnal migration of birds and bats over the Project Area. The results of the study, including nocturnal radar passage rates, flight altitude, flight direction, and visual findings, are summarized in this section. Refer to Woodlot's reports in Appendices A and B for full details.

## Passage Rates

Nocturnal radar observations indicate that passage rates in fall 2006 were 189 ± 21 targets/km/hour (hr), and the median passage rate was 170 targets/km/hr. Nocturnal passage rates were highly variable from night to night, ranging from 16 ± 3 to 604 ± 77 targets/km/hr (see Figure 4 in Appendix A). Passage rates had some variation throughout the night and the lowest rates occurred during the first hour of sampling (between crepuscular and nocturnal hours) and near sunrise; whereas the highest rates occurred near the third, fourth, or fifth hour of sampling (see Figure 5 in Appendix A).

Nocturnal radar observations indicate that passage rates in spring 2007 were 419 ± 40 targets/km/hr with a median passage rate of 391 targets/km/hr. The mean nocturnal passage rates were variable from night to night, ranging from 22 ± 7 targets/km/hr to 1,190 ± 94 targets/km/hr (see Figure 2-3 in Appendix B). Passage rates had some variation throughout the night and the lowest rates occurred during the first hour of sampling (between crepuscular and nocturnal hours) and near sunrise; whereas the highest rates occurred from the third through the seventh hour of sampling (see Figure 2-4 in Appendix B). Nights with the highest passage rates also had calm to moderate winds.

The overall mean passage rate in fall was low to average; whereas the spring passage rate was higher than average but well within the range of historical results from similar radar studies in the northeast (see Tables 3-6 and 3-7).

## Flight Altitude

The mean nocturnal flight altitude for the fall 2006 season based on vertical radar sampling less than 1,500 meters (4,921 feet) agl was 1,157 ± 39 feet (353 ± 12 meters) agl, with a range among nights of 748 to 1,674 feet (228 to 510 meters) agl. The mean nocturnal flight altitude based on vertical radar sampling less than 4,921 feet (1,500 meters) agl in spring 2007 was 1,617 ± 92 feet (493 ± 28 meters) agl, with a range among nights of 581 to 3,009 feet (177 to 917 meters) agl. The spring and fall results are similar, and they are consistent with similar radar studies conducted in the northeast (see Tables 3-6 and 3-7) and existing literature regarding the flight of nocturnal migrants (Kerlinger 1989; Mabee et al. 2006a, b; Smithsonian Migratory Bird Center 2006). Mean flight altitudes were variable throughout the study periods (see Figure 7 in Appendix A and Figure 2-6 in Appendix B). There was no significant pattern as to the timing of the lowest altitudes. Approximately 9% of all nocturnal targets in fall 2006 and approximately 3% of all nocturnal targets in spring 2007 flew below 120 meters (394 feet) agl, a close approximation to the maximum turbine height. These percentages are consistent with similar radar studies conducted in the northeast United States.

**Table 3-6 Comparison of Fall Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State**

| Location | Year | Mean Passage Rate[1] (Targets/ km/hr) | Mean Flight Altitude (Meters [Feet] agl) | Average Flight Direction (Degrees) | Percentage of Targets at Altitudes <125 Meters | Reference |
|---|---|---|---|---|---|---|
| Perry (Dairy Hills), Wyoming Co. | 2005 | 64 ± 3 (hor), 170 (ver) | 466 ± 2 (1,529 ± 7) | 180 | 10 | Young et al. 2006 |
| Alabama (Horizon), Genesee Co. | 2005 | 67 (hor), 165 (ver) | 489 (1,604) | 219 | 11 | Gary 2007 |
| Arkwright (New Grange), Chautauqua Co. | 2007 | 112 ± 6 (hor) 178 ± 7 (ver) | 458 ± 2[4] (1,502 ± 7) | 208 | 10 | Kerns et al. 2008 |
| Harrisburg, Jefferson Co. | 1998 | 122 | -[2] | 181 | -[2] | Cooper and Mabee 2000 |
| Clinton (Marble River), Clinton Co. | 2005 | 152 ± 16 | 438 ± 15 (1,437 ± 49) | 193 | 5[3] | Woodlot 2006i |
| Tug Hill (Maple Ridge), Lewis Co. | 2004 | 166 | 430 (1,411) | 195 | 7 | Mabee et al. 2005a |
| Wethersfield, Wyoming Co. | 1998 | 168 | -[2] | 179 | -[2] | Cooper and Mabee 2000 |
| **Villenova (Noble Ball Hill), Chautauqua Co.** | **2006** | **189 ± 21** | **353 ± 12 (1,157 ± 39)** | **216** | **9[3]** | **Woodlot 2008a** |
| Prattsburgh (UPC), Steuben Co. | 2004 | 193 ± 21 | 516 ± 17 (1,692 ± 148) | 188 | 2.6 | Woodlot 2004 |
| Sheldon (High Sheldon), Wyoming Co. | 2005 | 197 ± 24 | 422 ± 12 (1,385 ± 39) | 213 | 3[3] | Woodlot 2006c |
| Ellenburg (Noble), Clinton Co. | 2005 | 197 ± 37 | 333 ± 1 (1,093 ± 3) | 162 | 12 | Mabee et al. 2006c |
| Prattsburgh-Italy (Ecogen), Steuben Co. | 2004 | 200 ± 12 | 365 ± 3 (1,198 ± 10) | 177 | 9 | Mabee et al. 2005b |
| Carthage, Jefferson Co. | 1995 | 225 | -[2] | NA | -[2] | Cooper et al. 1995 in Cooper et al. 2004c |
| Westfield, Chautauqua Co. | 2003 | 238 ± 48 | 532 ± 3 (1,745 ± 10) | 199 | 4 | Cooper et al. 2004c |
| Wethersfield (Noble), Wyoming Co. | 2006 | 256 ± 20 | 344 ± 1 (1,129 ± 3) | 203 | 11 | Mabee et al. 2006b |

**Table 3-6 Comparison of Fall Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State**

| Location | Year | Mean Passage Rate[1] (Targets/ km/hr) | Mean Flight Altitude (Meters [Feet] agl) | Average Flight Direction (Degrees) | Percentage of Targets at Altitudes <125 Meters | Reference |
|---|---|---|---|---|---|---|
| Centerville (Noble), Allegany Co. | 2006 | 259 ± 27 | 350 ± 2 (1,148 ± 7) | 208 | 12 | Mabee et al. 2006b |
| Moresville (Invenergy), Delaware Co. | 2005 | 315 | 494 (1,621) | 251 | 3 | Woodlot 2007 |
| Cape Vincent, Jefferson Co. (horizontal and vertical modes) | 2006 | 346 | 490 (1,608) | 209 | 8 | Kerns et al. 2007 |
| Jordanville, Herkimer Co. | 2005 | 380 | 440 (1,444) | 208 | 6 | Woodlot 2005d in Woodlot 2006f |
| Clayton (Horse Creek), Jefferson Co. | 2005 | 418 | 475 (1,558) | 168 | 10[6] | Woodlot 2005i |
| Bliss (Noble), Allegany Co. | 2005 | 444 | 411 (1,348) | Southwest | 13 | Yonker and Landon 2005 |
| Howard, Steuben Co. | 2005 | 481 ± 52 | 491 ± 14 (1,611 ± 46) | 185 | 5[7] | Woodlot 2005a |
| Dutch Hill, Steuben Co. | 2006 | 535 | 358 (1,175) | 215 | 11 | Roy 2006 |
| Chateaugay, Franklin Co. | 2006 | 643 ± 63 | 431 ± 17 (1,414 ± 56) | 212 | 8[3] | Woodlot 2006f |
| Fairfield (Top Notch), Herkimer Co. | 2005 | 691 | 516 (1,693) | 198 | 4 | Woodlot 2005c in Woodlot 2006f |
| West Hill, Madison Co. | 2005 | 732 | 664 (2,179) | 223 | 2[5] | Gary 2007 |

Note:

[1] There are a number of factors that can influence the mean passage rate including: weather, sampling methodology, equipment, study duration, site location, experience of firm/staff, etc. Therefore, this summary is intended to show a general comparison of passage rates of radar studies conducted in New York State and it should not be used as a direct comparison between listed sites without additional evaluation.

[2] ABR does not believe it is appropriate to compare flight altitudes with studies conducted before 2001 because of different equipment that probably resulted in a low altitude bias (Mabee et al. 2006a).

[3] <120 meters (394 feet).

[4] Mean Flight Altitude is presented as (Meters [feet] arl [above radar level]).

[5] <118 meters (387 feet).

[6] <150 meters (492 feet).

[7] <91 meters (299 feet).

Key:
NA = Not available.

**Table 3-7 Comparison of Spring Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State**

| Location | Year | Mean Passage Rate[1] (Targets/ km/hr) | Mean Flight Altitude (Meters agl [feet]) | Average Flight Direction (Degrees) | Percentage of Targets at Altitudes <125 Meters | Reference |
|---|---|---|---|---|---|---|
| Wethersfield, Wyoming Co. | 1999 | 41 | -[2] | 21 | -[2] | Cooper and Mabee 2000 |
| Ellenburg (Noble), Clinton Co. | 2005 | 110 ± 19 | 338 ± 3 (1,109 ± 10) | 30 | 20 | Mabee et al. 2006c |
| Alabama (Horizon), Genesee Co. | 2005 | 111 (hor), 200 (ver) | 413 | 35 | 14 | Gary 2007 |
| Sheldon (High Sheldon), Wyoming Co. | 2005 | 112 | 418 (1,371) | 25 | 6[3] | Woodlot 2006l |
| Perry (Dairy Hills), Wyoming Co. | 2005 | 117 ± 9 | 397 ± 2 (1,302 ± 7) | 14 | 15 | Young et al. 2006 |
| Carthage, Jefferson Co. | 1994 | 159 | -[2] | NA | -[2] | Cooper et al. 1995 in Cooper et al. 2004a |
| West Hill, Madison Co. | 2005 | 160 | 291 | 31 | 25[6] | Gary 2007 |
| Cape Vincent, Jefferson Co. | 2007 | 166 (hor), 191 (ver) | 441 | 34 | 14 | Kerns et al. 2007 |
| Prattsburgh-Italy (Ecogen), Steuben Co. | 2005 | 170 ± 35 | 319 ± 2 (1,047 ± 7) | 18 | 18 | Mabee et al. 2005c |
| Arkwright (New Grange), Chautauqua Co. | 2007 | 175 (hor), 635 (ver) | 450 ± 2[5] (1,476 ± 7) | 18 | 13 | Kerns et al. 2008 |
| Moresville (Invenergy), Delaware Co. | 2005 | 210 | 431 (1,414) | 46 | 8 | Woodlot 2007 |
| Clinton (Marble River), Clinton Co. | 2005 | 254 ± 45 | 422 ± 54 (1,385 ± 177) | 40 | 11[3] | Woodlot 2006h |
| Prattsburgh (First Wind), Steuben Co. | 2006 | 277 ± 52 | 370±41 (1,214±135) | 22 | 16 | Woodlot 2005f |
| Centerville (Noble Allegany), Allegany Co. | 2006 | 290 ± 35 | 351 ± 2 (1,152 ± 7) | 22 | 16 | Mabee et al. 2006a |
| Wethersfield (Noble), Wyoming Co. | 2006 | 324 ± 27 | 355 ± 2 (1,165 ± 7) | 12 | 19 | Mabee et al. 2006a |

**Table 3-7 Comparison of Spring Mean Passage Rates, Mean Flight Altitudes, Average Flight Directions, and Percentage of Targets at Altitudes Less than 410 Feet (125 Meters) at Sites in New York State**

| Location | Year | Mean Passage Rate[1] (Targets/ km/hr) | Mean Flight Altitude (Meters agl [feet]) | Average Flight Direction (Degrees) | Percentage of Targets at Altitudes <125 Meters | Reference |
|---|---|---|---|---|---|---|
| Chateaugay, Franklin Co. | 2006 | 360 ± 37 | 409 ± 26 (1,342 ± 85) | 48 | 18[3] | Woodlot 2006d |
| Cohocton, Steuben Co. | 2005 | 371 | 609 (1,198) | 28 | 12 | Woodlot 2006k in Woodlot 2006d |
| Westfield, Chautauqua Co. | 2003 | 395 ± 69 | 528 ± 3 (1,732 ± 10) | 29 | 4 | Cooper et al. 2004a |
| Jordanville, Herkimer Co. | 2005 | 409 | 371 (1,217) | 40 | 21 | Woodlot 2005g in Woodlot 2006d |
| **Villenova (Noble Ball Hill), Chautauqua Co.** | **2007** | **419 ± 40** | **493 ± 28 (1,617 ± 92)** | **10** | **3[3]** | **Woodlot 2008b** |
| Howard, Steuben Co. | 2006 | 440 ± 68 | 426 ± 24 (1,398 ± 79) | 27 | 13[4] | Woodlot 2006e |
| Clayton (Horse Creek), Jefferson Co. | 2005 | 450 | 443 | 30 | 14[7] | Woodlot 2005h |
| Cape Vincent, Jefferson Co. | 1995 | 473 | -[2] | 18 | -[2] | Cooper et al. 1995 in Kerlinger and Guarnaccia 2006 |
| Fairfield (Top Notch), Herkimer Co. | 2005 | 509 | 419 (1,375) | 44 | 20 | Woodlot 2006d |

Notes:

[1] There are a number of factors that can influence the mean passage rate including: weather, sampling methodology, equipment, study duration, site location, experience of firm/staff, etc. Therefore, this summary is intended to show a general comparison of passage rates of radar studies conducted in New York State and it should not be used as a direct comparison between listed sites without additional evaluation.

[2] ABR does not believe it is appropriate to compare flight altitudes with studies conducted before 2001 because of different equipment that probably resulted in a low altitude bias (Mabee et al. 2006a).

[3] <120 meters (394 feet).

[4] <91 meters (299 feet).

[5] Mean Flight Altitude is presented as (Meters [feet] arl [above radar level]).

[6] <118 meters (387 feet).

[7] <150 meters (492 feet).

Key:
NA = Not available.

In the fall, the mean flight altitude was 768.2 feet (234.5 meters) higher than the maximum turbine height (388.8 feet [118.5 meters]) but slightly lower than at the other locations in the east where similar studies have been conducted (see Table 3-6). The mean flight altitude in the spring was 1,230.2 feet (374.5 meters) higher than the maximum turbine height but in general, was in the middle of the range of mean flight altitudes from other studies (see Table 3-7). In both spring and fall, the majority of migration occurred well above the height of the proposed turbines.

### Flight Direction

The mean flight direction of targets observed on radar was 216º in fall and 10º in spring. This indicates that the predominant flight direction was southwesterly in fall and northerly in spring, which is consistent with the expected seasonal migration flight directions. See Figure 6 in Appendix A and Figure 2-5 in Appendix B for compass rose figures showing the flight directions of targets.

### Nighttime Visual Study

Based on visual sampling to an approximate altitude of 120 meters (394 feet) agl, a total of 31 birds and 12 bats were observed in fall 2006 during 313 five-minute observations and four birds and 13 bats in spring 2007 during 157 five-minute observations.

Woodlot also calculated the percentage of birds and bats detected with the radar based on flight behavior. To distinguish birds from bats, flight behavior across the radar screen was noted where erratic flight behavior indicated bats and linear movement indicated either birds or bats. From this coarse level analysis, 95% of targets were birds, 3% were bats, and 2% were insects in the fall. In the spring, 96% of targets were birds, 2% were bats, and 2% were insects (see Appendices A and B for more information).

## 3.3.2 Migratory Raptor Surveys

### 3.3.2.1 Fall Raptor Surveys

Fall migratory raptor surveys were conducted by E & E on September 15, October 5, and November 1, 2006, for a total of 21 survey hours. Migrants were determined as those raptors with a non-northerly flight path. Locally foraging raptors were also counted but not included in the migrant totals. Weather conditions on the survey days were generally favorable for fall raptor migration with northerly, northeasterly or northwesterly winds; light drizzle on the morning of September 15, 2006, but otherwise no precipitation; and average temperatures.

During Project surveys in fall 2006, E & E observed a total of 94 raptors including 59 migrants and 35 local raptors of eight species (see Table 3-8 and Appendix E, Table E-1). The migratory passage rate was 2.8 raptors per observer hour. The nearest local hawk watch is in Hamburg, New York, but a hawk watch is not conducted at the Hamburg site or other regional hawk watches in the fall because of the very sparse raptor migration; therefore, no comparison could be made for the fall. Turkey Vultures were the most prevalent raptor species seen. Many of the

Turkey Vultures identified were likely local birds exhibiting back and forth foraging flights; however, all birds observing flying in a non-northerly direction were considered potential migrants. Approximately 42% of the migratory raptors flew below 400 feet agl at some point during observation. The primary flight direction of migratory raptors was southeast and no concentrated flight paths were identified. General flight paths observed from the raptor survey location are shown on Figure 3-5.

**Table 3-8 Fall Raptor Survey Results**

| | Common Name | 9/15/06 | 10/5/06 | 11/1/06 | Grand Total |
|---|---|---|---|---|---|
| Local | Turkey Vulture | 5 | 3 | 0 | 8 |
| | Northern Harrier | 2 | 2 | 2 | 6 |
| | Cooper's Hawk | 0 | 1 | 1 | 2 |
| | Red-tailed Hawk | 4 | 2 | 6 | 12 |
| | Unidentified Buteo | 0 | 0 | 3 | 3 |
| | American Kestrel | 2 | 1 | 1 | 4 |
| **Total Locals** | | **13** | **9** | **13** | **35** |
| Migrant | Turkey Vulture | 17 | 28 | 0 | 45 |
| | Northern Harrier | 0 | 2 | 0 | 2 |
| | Sharp-shinned Hawk | 0 | 1 | 0 | 1 |
| | Cooper's Hawk | 0 | 1 | 0 | 1 |
| | Red-shouldered Hawk | 0 | 6 | 0 | 6 |
| | Red-tailed Hawk | 0 | 0 | 1 | 1 |
| | Merlin | 1 | 1 | 0 | 2 |
| | Unidentified Raptor | 0 | 0 | 1 | 1 |
| **Total Migrants** | | **18** | **39** | **2** | **59** |
| | **Grand Total** | **31** | **48** | **15** | **94** |

The findings are consistent with the knowledge of fall raptor migration in the region and the nearby studies conducted at the New Grange Wind Farm Project Area, which had an overall passage rate of six raptors/hour (Kerns et al. 2008), as raptors do not concentrate in large numbers in this area and movements are relatively diffuse. There is no evidence of a pronounced fall migratory raptor corridor in the Project Area.

### 3.3.2.2 Spring Raptor Surveys

Spring migratory raptor surveys were conducted on April 22, 23, and 30, 2007, for a total of 21 survey hours in 2007; and March 30, April 7, 15, and 24, and May 6 and 13, 2008 for a total of 42 survey hours in 2008. Migrants were determined as those raptors with a non-southerly flight path. Locally foraging raptors were also counted but not included in the migrant totals. Weather conditions on the survey days were generally favorable for raptor migration with westerly or south-westerly winds; average to above average temperatures; and no precipitation except for a 10-minute shower on April 23, 2007.

Over the course of nine raptor surveys conducted during the spring of 2007 and 2008, a total of 671 raptors of 12 species were identified, 332 of which were considered to be migrants (see Table 3-9 and Table E-1). The migratory passage rate was 5.3 raptors per observer hour. For comparison, at the Hamburg Hawk Watch in Hamburg, New York over the same nine survey days, 4,083 raptors were tallied with a passage rate of 65.6 raptors/hour (HawkCount 2007, 2008). At the Ripley Hawk Watch in Ripley, New York over the same nine survey days, 7,947 raptors were tallied with a passage rate of 135.9 raptors/hour (HawkCount 2007, 2008).

The findings from the 2007 and 2008 spring migratory raptor surveys are consistent with the knowledge of spring raptor migration in New York State and the nearby studies conducted at the New Grange Wind Farm Project Area, which had an overall passage rate of three raptors/hour (Kerns et al. 2008), as the birds concentrate in higher numbers along the Great Lakes and are relatively diffuse elsewhere. General flight paths observed from the raptor survey location are shown on Figure 3-6. There is no evidence of a pronounced spring migratory raptor corridor in the Project Area.

### 3.3.3 Spring Migratory Surveys

In 2007, a total of 1,624 birds of 90 species was recorded during migratory bird surveys conducted at 28 points (A through ZC) on May 11 and 22, 2007 (see Appendix E, Table E-2 for totals and Tables E-3 and E-4 for survey results by date). In 2008, 1,603 birds of 75 species was recorded at 33 points (A through ZH) on May 6 and 16, 2008 (see Appendix E, Table E-5 for totals and Tables E-6 and E-7 for survey results by date).

Flyovers in 2007 made up 111 of the 1,624 birds and were observed at 23 of the 28 survey locations; species observed flying over the Project Area included Mallard (five birds), Turkey Vulture (11 birds), Red-tailed Hawk (one bird), Blue Jay (four birds), American Crow (12 birds), Common Raven (two birds), Tree Swallow (six birds), Barn Swallow (three birds), Northern Mockingbird (one bird), Yellow Warbler (two birds), Red-winged Blackbird (seven birds), Common Grackle (three birds), Brown-headed Cowbird (one bird), Baltimore Oriole (three birds), Purple Finch (five birds), and American Goldfinch (45 birds). Flyovers in 2008 made up 208 of the 1,603 birds and were observed at 30 of the 33 survey locations; species observed flying over the Project Area included Great Blue Heron (one bird), Canada Goose (five birds), Red-tailed Hawk (one bird), American Kestrel (one bird), Killdeer (two birds), Mourning Dove (nine birds), Northern Flicker (two birds), Great Crested Flycatcher (one bird), Eastern Kingbird (one bird), Blue Jay (29 birds), American Crow (21 birds), Tree Swallow (three birds), Barn Swallow (eight birds), Eastern Bluebird (one bird), American Robin (two birds), Bobolink (five birds), Red-winged Blackbird (21 birds), Common Grackle (13 birds), Brown-headed Cowbird (32 birds), House Finch (one bird), and American Goldfinch (49 birds). All of these species are known to breed in or within proximity to the Project Area and the number of flyovers is relatively low

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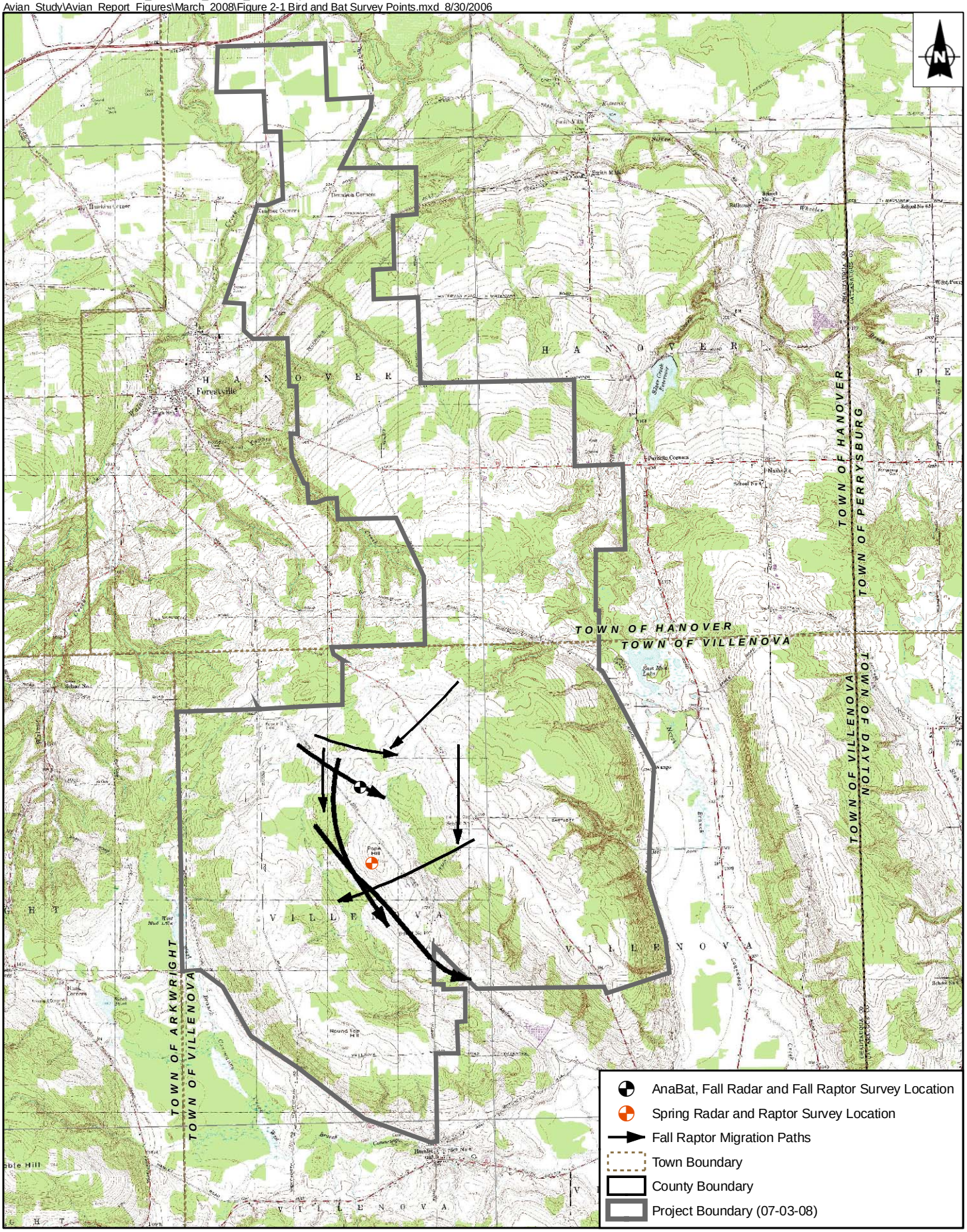
\\BUFSDL4\GIS\Buffalo\Noble_Wind\2008_NOBLE_SITES\Maps\Villenova\MXDs\
Avian_Study\Avian_Report_Figures\March_2008\Figure 2-1 Bird and Bat Survey Points.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

**Figure 3-5 Fall Raptor Migration Paths**
**Ball Hill Project Area**

0 0.5 1 2
Miles

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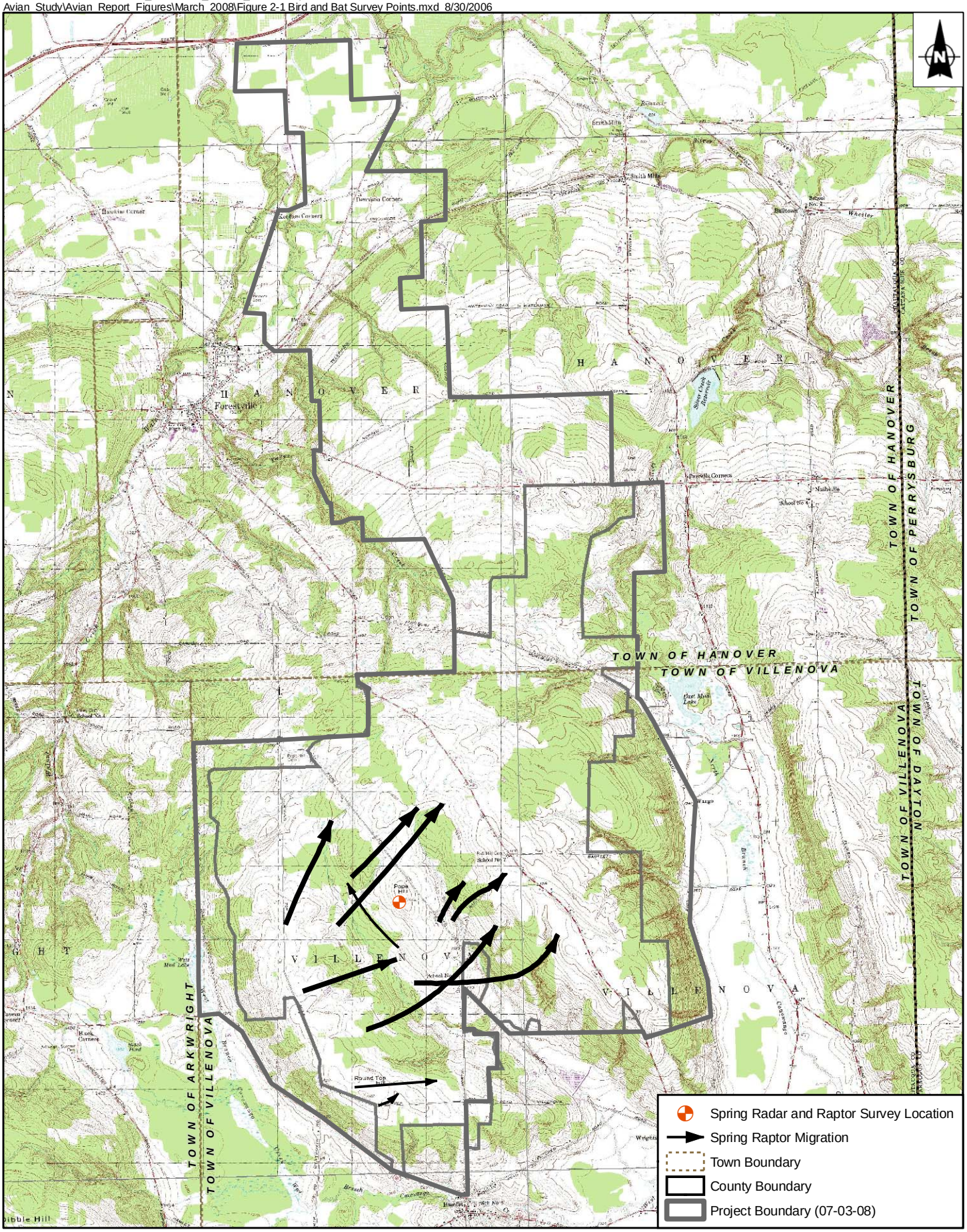
Avian_Study\Avian_Report_Figures\March_2008\Figure 2-1 Bird and Bat Survey Points.mxd 8/30/2006




*Source: USGS Cherry Creek Quad, 1990; USGS Forestville Quad, 1990; USGS Perrysburg Quad, 1990; USGS Hamlet Quad, 1990.*

Figure 3-6 Spring Raptor Migration Paths
Ball Hill Project Area

0 0.5 1 2
Miles

**Table 3-9 Spring Raptor Survey Results**

| | Common Name | 4/22/07 | 4/23/07 | 4/30/07 | 3/30/08 | 4/07/08 | 4/15/08 | 4/24/08 | 5/06/08 | 5/13/08 | 2007 Total | 2008 Total | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local | Turkey Vulture | 11 | 0 | 22 | 5 | 19 | 2 | 57 | 59 | 81 | 33 | 223 | 256 |
| | Osprey | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| | Bald Eagle | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| | Northern Harrier | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 5 | 6 |
| | Cooper's Hawk | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 |
| | Red-shouldered Hawk | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| | Broad-winged Hawk | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| | Red-tailed Hawk | 2 | 2 | 5 | 4 | 7 | 3 | 11 | 10 | 9 | 9 | 44 | 53 |
| | Rough-legged Hawk | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| | American Kestrel | 2 | 1 | 0 | 2 | 1 | 2 | 0 | 2 | 2 | 3 | 9 | 12 |
| | Unidentified Raptor | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| **Total Locals** | | **18** | **7** | **31** | **13** | **28** | **9** | **68** | **71** | **94** | **56** | **283** | **339** |
| Migrant | Turkey Vulture | 7 | 18 | 46 | 43 | 71 | 21 | 33 | 4 | 3 | 71 | 175 | 192 |
| | Osprey | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 3 |
| | Bald Eagle | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| | Northern Harrier | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 5 |
| | Sharp-shinned Hawk | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 7 | 1 | 8 |
| | Cooper's Hawk | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| | Broad-winged Hawk | 1 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | Red-tailed Hawk | 3 | 1 | 2 | 8 | 3 | 6 | 10 | 3 | 0 | 6 | 30 | 36 |
| | Rough-legged Hawk | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 |
| | Golden Eagle | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| | American Kestrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| | Unidentified Buteo | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 3 |
| | Unidentified Raptor | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| **Total Migrants** | | **16** | **47** | **51** | **56** | **77** | **27** | **43** | **10** | **5** | **114** | **218** | **332** |
| | **Grand Total** | **34** | **54** | **82** | **69** | **105** | **36** | **111** | **81** | **99** | **170** | **501** | **671** |

in comparison to total birds identified. Thus, these birds were included in the results that follow.

On May 11, 2007, 787 birds of 76 species were identified, and on May 22, 2007, 837 birds of 66 species were identified. The most numerous species recorded in 2007 were Red-winged Blackbird (261 birds), American Crow (125 birds), and Bobolink (99 birds). On May 6, 2008, 718 birds of 61 species were identified, and on May 16, 2008, 885 birds of 72 species were identified. Similarly to 2007, Red-winged Blackbird (239 birds) and American Crow (139 birds) were the two most numerous species recorded in 2008. In 2008, American Robin was the third most common species recorded with 135 birds observed. Overall, the species observed were generally expected based on the habitat, location, and time of year. The averages for total birds and species per survey location are indicated in Table 3-10.

**Table 3-10 Spring Migratory Survey Results**

| | May 11, 2007 | May 22, 2007 | May 6, 2008 | May 16, 2008 |
|---|---|---|---|---|
| Total Species on Survey | 76 | 66 | 61 | 72 |
| Average Total Birds per Location | 28.1 | 29.9 | 21.8 | 26.8 |
| Average Number of Species per Location | 13.8 | 15.8 | 10.7 | 14.3 |

In 2007, the total number of birds per point across both surveys ranged between 12 and 73 birds, with an overall average of 29.0 birds per point. Points Y, P, and H had the highest number of birds with averages of 39 or more birds and points T, ZB, and U held the lowest number of total birds with averages under 20 birds. In 2008, the total number of birds per point across both surveys ranged between 2 and 45 birds, with an overall average of 24.3 birds per point. Points E, B, C, and J had the highest number of birds with averages of 34 or more birds and points ZH, T, and ZB had the lowest number of birds with averages under 10 birds.

In 2007, the species richness per point across both surveys ranged between six and 26 species, with an overall average of 14.8 species per point. Survey points P, H, and A averaged more than 19 species, while survey points S, ZB, D, and K averaged fewer than 11 species. In 2008, the species richness per point across both surveys ranged between one and 22 species, with an overall average of 12.5 species per point. Survey points E, K, ZG, and M averaged more than 17 species, while survey points ZH, ZA, and ZD averaged fewer than seven species.

The survey points with the highest number of birds and species richness, generally, have a mix of habitats. The survey points with the lowest number of birds and species richness, generally, were without a mix of habitats and/or had poor lines-of-sight.

Most of the birds tallied during the spring migratory survey were likely local breeders rather than migrants, as most species identified were within their population breeding range. However, surveys were conducted during the migratory sea-

son, as evidenced by sightings of several species that do not breed in the area, including Palm Warbler and White-crowned Sparrow. There was no evidence from the surveys or other time spent in the Project Area during the spring season that the Project Area serves as an increased migratory corridor or stopover point for passerines or other bird species.

### 3.3.4 Breeding Bird Surveys

A three-minute breeding bird survey was conducted at 13 points (points A through M) on June 11, 2007 and was repeated on June 26, 2007 (see Figure 2-1). In 2008, a 5-minute breeding bird survey was conducted at 26 points over two consecutive days (June 11 and June 12, 2008). Six points (points B, E, F, G, H, and L) surveyed in 2008 were also surveyed in 2007. In 2007, a combined total of 609 birds of 68 species were identified during the two surveys (see Appendix E, Table E-8 for totals and Tables E-9 and E-10 for survey results by date). Fifty-six species were identified during the June 11, 2007, survey for a total of 250 birds. Sixty species and a total of 359 birds were identified during the June 26, 2007 survey. The most numerous species recorded in 2007 were American Goldfinch (57 birds), Bobolink (49 birds), Red-winged Blackbird (41 birds), and American Crow (41 birds). Although the 2008 survey was conducted across two days all points were visited only once and therefore the results are presented as one survey. In 2008, 653 birds of 72 species were identified across the 26 survey points (see Appendix E, Table E-11 for totals). The most numerous species recorded in 2008 were Bobolink (60 birds), American Crow (59 birds), Red-winged Blackbird (49 birds), and Song Sparrow (44 birds).

Total birds per point in 2007 ranged from seven to 40 birds, with averages of 19.2 birds on June 5 and 27.6 birds on June 22. Total birds per point in 2008 ranged from nine to 36, with an average of 25.1 birds. Total species per point in 2007 ranged from six to 18 species, with averages of 11.2 species on June 5 and 15.2 species on June 22. Survey points A, J, and L averaged (for the two survey days) less than 16 birds per location and low species diversity (12 or fewer species per location); whereas points H, M, and K averaged 27 or more birds and relatively higher species diversity (15 or more species per location). Total species per point in 2008 ranged from seven to 20, with an average of 14.1 species. In 2008, only two survey points (T3 and T35) had 16 or fewer birds and 12 or fewer species. In contrast, eight points (F, H, L, T3, T17, T25, T58, and T64) had 27 or more birds and 15 or more species.

The species composition was generally consistent with what was anticipated for the habitat and location and was generally consistent with those species regularly found in or near Chautauqua County during the New York State Breeding Bird Atlas (2000 through 2005) and USGS breeding bird surveys. No threatened or endangered species were identified during E & E breeding bird surveys; only one state species of special concern, Grasshopper Sparrow, was detected.

To provide a more standardized view of habitat, percent cover within a 0.25-mile radius of the 2008 survey locations was determined from a geographic information system (GIS) aerial photograph layer. A 0.25-mile-radius circle was centered over the survey point and the habitat type (agricultural, grassland, reverting field, and forest) within the circle was approximated to the nearest 25% (see Tables E-12 and E-13). Acknowledging that habitat could have changed since the aerial photograph was taken in 2004, percent cover was compared to notes taken in the field and adjusted as necessary. The survey points were in a variety of habitat types, but most had at least some forested habitat nearby (see Tables 3-11, E-12, and E-13) and were consistent with the overall habitat at the proposed turbines. In general, more birds and species were found at survey points with a mix of habitats. Bird species observed during surveys were typical of the habitats examined. GPS coordinates of the 2008 survey locations are included on Table E-12.

**Table 3-11 Summary of Habitat Types Based on Aerial Photograph Interpretation, Ball Hill 2008 Breeding Bird Surveys**

| Habitat Type | Number of Points with | | | |
|---|---|---|---|---|
| | 100% Cover | 75% Cover | 50% Cover | 25% Cover |
| Forest | 1 | 6 | 7 | 9 |
| Row Crop | 0 | 5 | 6 | 7 |
| Grassland | 0 | 0 | 2 | 9 |
| Reverting Field | 0 | 0 | 0 | 12 |

### 3.3.5 Bat Habitat Surveys

Habitat surveys of the Project Area were conducted during various field efforts in fall 2006, spring 2007, and spring 2008. Surveys identified no major rock outcroppings, cave dwellings, or hibernacula where bats may roost within the Project Area. Based on the mosaic of habitat types found throughout the Project Area, suitable habitat was identified for the most common bat species that would be expected to occur in the Project Area. The acoustical monitoring surveys (see Section 3.3.6) confirmed their presence in the Project Area.

In order to determine the potential for state- and federally endangered Indiana Bats to occur in the Project Area, the suitability of the Project Area to support the Indiana Bat was evaluated. Preferred habitats and geographic location can vary between males and females and time of year. These bats may react positively or negatively to habitat disturbances (i.e., forest management practices) and are known to typically forage in semi-open forested habitats, in riparian areas, and along forested edges (USFWS 2007c). Roost trees can vary in size and species. As these environments are common in the Project Area as well as most of New York State, there is suitable habitat for them to occur in the Project Area. However, the range of the Indiana Bat in New York State is primarily in the eastern part of the state. No known Indiana Bat hibernacula were documented by NYSDEC or USFWS within 40 miles of the Project Area (Seoane 2006, 2008).

As of November 2006, the USFWS has records of winter populations (i.e., positive winter occurrence since 1995) of the Indiana Bat at approximately 281 different hibernacula located in 19 states (Alabama, Arkansas, Connecticut, Illinois, Indiana, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Vermont, Virginia, and West Virginia) (USFWS 2007c). New York has two of the 13 rangewide Priority 1 hibernacula, four of the 45 Priority 2 hibernacula, three of the 125 Priority 3 hibernacula, and two of the 85 Priority 4 hibernacula that have positive winter occurrence since 1995. Winter surveys were conducted in 2005, and New York had 9.1% of the hibernating Indiana Bats (USFWS 2007c). The two Priority 1 hibernacula located in New York are in Ulster County: Walter William Preserve Mine and the Williams Hotel Mine. The current (2005) population estimate for Walter William Preserve Mine is 11,394 bats and for the Williams Hotel Mine is 15,438 bats (USFWS 2007c). No Indiana Bat hibernacula were identified in western New York (USFWS 2007c).

As of October 2006, there are records of 269 maternity colonies in 16 states that are considered to be locally extant (Arkansas, Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania, Tennessee, Vermont, Virginia, and West Virginia) (USFWS 2007c). Of the 269 colonies, 54% (146 colonies) have been found, mostly during mist-netting surveys, since 1997 (USFWS 2007c). Because maternity colonies are widely dispersed during the summer and difficult to locate, it is believe that only a fraction of existing maternity colonies have been identified based on the rangewide population estimates derived from winter hibernacula surveys. For example, based on the 2005 rangewide population estimate of 457,400 bats, and assuming a 50:50 sex ratio, and an average maternity colony size of 50 to 80 adult females (Whitaker and Brack 2002), then the 269 maternity colonies may only represent 6 to 9% of the 2,859 to 4,574 maternity colonies assumed to exist (USFWS 2007c). Although there may be disagreements regarding the average colony size, the geographic locations of the majority of Indiana Bat maternity colonies remain unknown. Most capture records of reproductively active female and juvenile Indiana Bats (i.e., evidence of a nearby maternity colony) have occurred in glaciated portions of the upper Midwest; however, a growing number of maternity records have been documented in New York, New Jersey, and Vermont in recent years as a result of spring emergence studies and mist netting efforts (Gardner and Cook 2002 in USFWS 2007c). To date, New York has 31 documented maternity colonies with locations spread among the following counties: Cayuga (1), Dutchess (5), Essex (1), Jefferson (9), Onondaga (4), Orange (8), and Oswego (3) (USFWS 2007c).

Male Indiana Bats are found throughout the range of the species, but in summer they are most common in areas near hibernacula (Hall 1962 in USFWS 2007c; Gardner and Cook 2002 in USFWS 2007c).

By compiling individual population estimates from bat surveys conducted within 214 hibernacula during the winters of 2003-2004 and 2004-2005, the USFWS has estimated that the 2005 rangewide population of Indiana Bats was approximately 457,000 bats (USFWS 2007c). The population estimates are considered conservative (i.e., underestimations), because some hibernacula may be physically inaccessible (e.g., areas ranging in size from small cracks and crevices to large rooms where Indiana Bats are known or believed to roost). In most winters, a few new hibernacula are discovered somewhere across the range, but discovery of previously unknown hibernacula with greater than 1,000 Indiana Bats is uncommon. Of hibernacula first documented during the past 10 years, only three have held more than 5,000 Indiana Bats when initially discovered: Magazine Mine in Illinois, Lewisburg Limestone Mine in Ohio, and Williams Hotel Mine in New York. Survey results indicate that numbers of Indiana Bats in New York have been increasing since 1990; however, the recent outbreak of White Nose Syndrome may ultimately change that trend.

Summer maternity habitats for Indiana Bats require dead/dying, large diameter trees, with exfoliating bark or cavities, located in upland forests, exposed to direct sunlight. Generally, Indiana Bat habitat requires streams/riparian areas (or some water source) harboring forage material. Dominant preferred tree species that provide suitable habitat for the Indiana Bat include Hickory (*Carya* spp.), Elm (*Ulmus* spp.), Oaks (*Quercus* spp.), and Cottonwood (*Populus deltoides*). Other tree species have been documented as "acceptable" tree habitat; however, these trees require very specific conditions to attract Indiana Bats. These secondary "acceptable" choices of tree species often include common trees where size, the presence of cavities, exfoliating bark, or dead "snag" portions occurs. This flexibility in tree use suggests that preference may not be determined by tree species; so much as it may be the condition of the potential roost site (Menzel et al. 2001).

Female Indiana Bats spend a majority of the summer in breeding nurseries, generally located around water resources (i.e., streams, ponds, and wetlands). Male Indiana Bats spend most of their time foraging in close proximity to hibernacula and along watercourses, locating preferred food sources of flying insects. In late summer and early fall (late May through November), these bats begin to move back to wintering hibernacula. The closest known Indiana Bat hibernacula to the Project Area are located in Onondaga County approximately 90 miles east and Jefferson County approximately 120 miles northeast (see Figure 3-7). Outside of New York, there are also known Indiana Bat hibernacula that are located in central and southern Pennsylvania, which are a similar distance away as Onondaga County, New York.

No hibernacula or roosts were identified within the Project Area. Based on the known locations of Indiana Bat hibernacula and the distance that separates these hibernacula from the Project Area, migration through the Project Area is unlikely.

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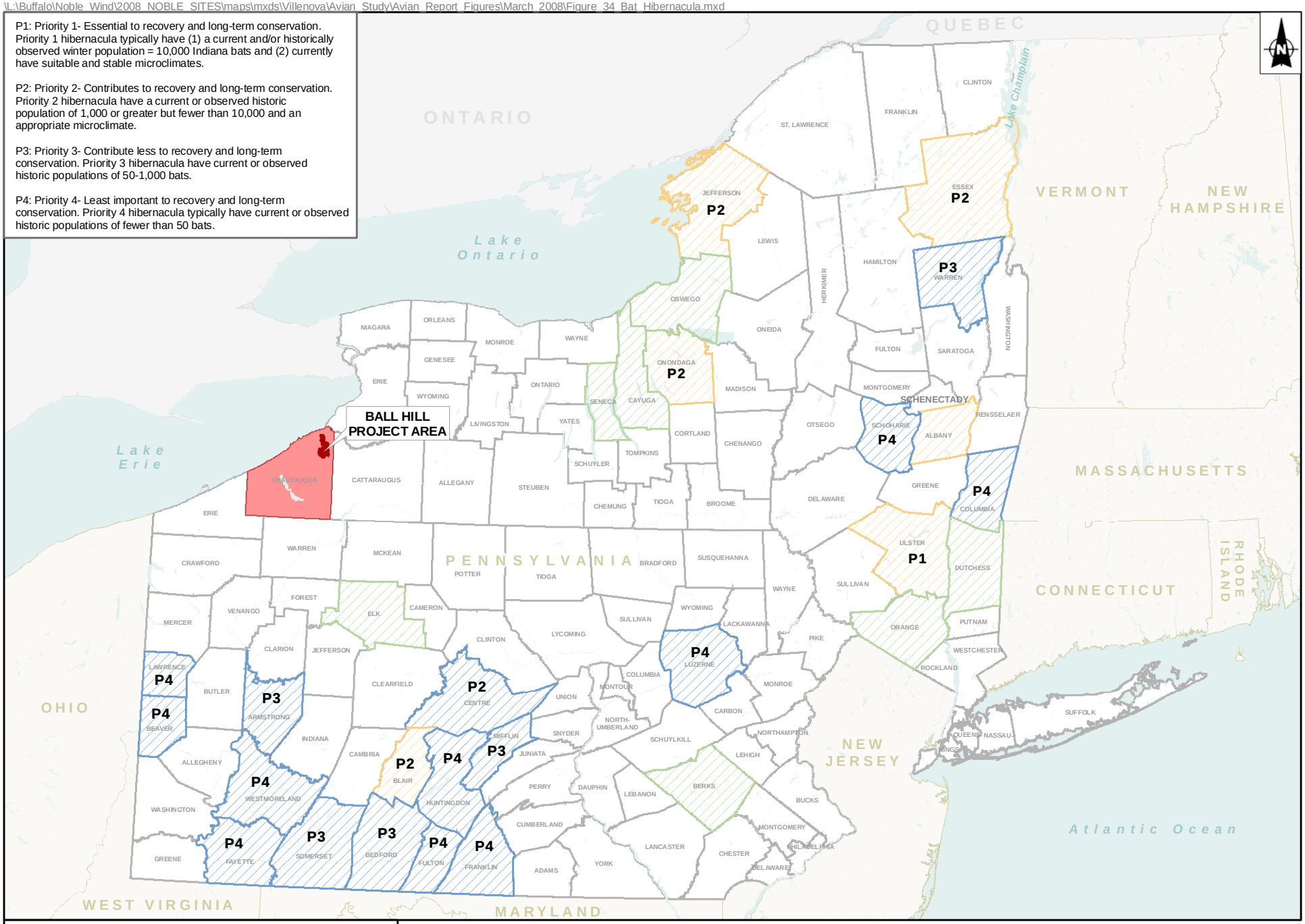
P1: Priority 1- Essential to recovery and long-term conservation. Priority 1 hibernacula typically have (1) a current and/or historically observed winter population = 10,000 Indiana bats and (2) currently have suitable and stable microclimates.

P2: Priority 2- Contributes to recovery and long-term conservation. Priority 2 hibernacula have a current or observed historic population of 1,000 or greater but fewer than 10,000 and an appropriate microclimate.

P3: Priority 3- Contribute less to recovery and long-term conservation. Priority 3 hibernacula have current or observed historic populations of 50-1,000 bats.

P4: Priority 4- Least important to recovery and long-term conservation. Priority 4 hibernacula typically have current or observed historic populations of fewer than 50 bats.




P# County with Priority Hibernacula
County with Indiana Bats in Winter
County with Indiana Bats in Summer
County with Indiana Bats in Summer-Winter

**Figure 3-7 Distribution of Indiana Bats in New York and Pennsylvania**

*Source: USFWS 2007b.*

### 3.3.6 Acoustical Monitoring for Bats

Woodlot conducted an acoustical monitoring study in the spring and fall of 2007. The results of their study, including mean detection rate, species composition, and the relationship of the number of call sequences to weather variables, are summarized in this section. The reports prepared by Woodlot are in Appendix B and Appendix C.

#### 3.3.6.1 Spring 2007 Study

Two detectors were deployed at different heights in a met tower in the Project Area from the night of March 28 to the night of May 30, 2007, yielding a total of 86 detector-nights of recordings (32 nights from the high detector and 54 nights from the low detector) (some nights of data were lost as a result of detector failure, which is common during remote studies). The met tower was located in an open agricultural field with some nearby woodlands (see Figure 2-1). A total of 78 bat call sequences were recorded during the spring sampling. The mean detection rate of both detectors was 0.9 call sequences per detector-night. Many more call sequences were recorded by the lower detector (74 call sequences), which was 20 meters (66 feet) above the ground, than by the upper detector (four call sequences), which was 40 meters (132 feet) above the ground. The lower detector was operational for more nights than the higher detector (54 vs. 32 nights of data, respectively), but even on nights when both detectors were functioning, the low detector recorded more call sequences than the high detector. The number of call sequences varied considerably from night to night. In general, the most calls were recorded over a few nights in late April and early May (see Figure 3-2 in Appendix B). At the low detector, the maximum number of call sequences occurred on May 8 and 9, 2007, when 13 call sequences were recorded on each night, and at the high detector, the maximum number of call sequences occurred on May 15, 2007, when two call sequences were recorded.

A large proportion (45% or 35 calls) of the call sequences were identified simply as “unknown” due to poor call quality or too few call pulses on which to base identification. Most of the call sequences, that could not be identified (91% [32 calls]) were high frequency calls, indicating that they may have been myotids or bats in the Eastern Red Bat/Eastern Pipistrelle guild. Of the call sequences that could not be identified (55% or 43 calls) based on good call quality and a sufficient number of call pulses, approximately 33% were myotids and 22% belonged to the “Big Brown” guild, which includes the Big Brown Bat, Silver-haired Bat, and Hoary Bat. Several of the recorded call sequences were distinct enough to identify to species, rather than just to guild. Two bat species were identified in this manner during the spring surveys, including the Big Brown Bat (two calls) and the Silver-haired Bat (one call). The call sequences in the myotid group could not be identified to species because the call sequences were too indistinct, and the other calls in the Big Brown guild were either that of the Big Brown Bat or Silver-haired Bat, but definitely not from the Hoary Bat. Both species identified are found throughout New York State.

The survey results (detections and species) were generally consistent, although slightly higher, than similar studies conducted in the spring in agricultural habitat in the northeast (see Table 5 in Appendix C). Comparison of results between sites has numerous caveats, especially for the mean detection rate (call sequences per night) because the detection rates can be easily skewed by one or several bats repeatedly circling the met tower and producing many calls on one or several nights during the study period. Site selection is also a key component for comparison, as most studies are conducted at met towers, which are often placed in wide open fields that are not near wooded areas where there is often more local bat activity. Therefore, sites located near wooded areas and/or wetlands may have higher detection rates compared to other sites because of the surrounding habitat. Other factors include, but are not limited to, duration of season, number of detectors, type of detectors, setup, and amount of operational time for the detectors as malfunctions are common for remote-based acoustical monitoring equipment.

For more complete results and discussion on the AnaBat surveys conducted in the spring, see the Woodlot report in Appendix B.

#### 3.3.6.2 Fall 2007 Study

Detectors were deployed at the same heights and on the same met tower used during the spring 2007 study. Surveys were conducted from the night of July 30 to the night of October 14, 2007, yielding a total of 154 detector-nights of recordings (77 detector-nights at the low detector and 77 detector-nights at the high detector). A total of 541 bat call sequences were recorded during the fall sampling. The mean detection rate for both detectors was 3.5 call sequences per detector-night. Both detectors recorded a similar number of call sequences, with the low detector (295 calls) recording a few more calls than the high detector (246 calls). The number of call sequences varied and no calls were detected on a number of nights toward the end of the sampling period; consequently, no seasonal trends were observed (see Figure 2 in Appendix C). At the high detector, the maximum number of call sequences occurred on August 29, 2007, when 22 call sequences were recorded, and at the low detector, the maximum number of call sequences occurred on September 21, 2007, when 20 call sequences were recorded.

The highest proportion (54% or 291 calls) of the recorded call sequences were labeled as unknown due to short call sequences, poor call signature formation, or static interference. More low frequency calls (62% or 85 calls) were recorded than high frequency calls (38% or 52 calls); the low frequency calls are characteristic of the Big Brown guild. The composition of bat call sequences were 197 (36%) in the Big Brown guild, 27 (5%) in the Eastern Red Bat/Eastern Pipistrelle guild, and 26 (5%) in the Myotis guild. Several of the recorded call sequences were distinct enough to identify to species, rather than just to guild. Five bat species were identified in this manner during the spring surveys, including the Silver-haired Bat (52 calls), Hoary Bat (30 calls), Eastern Red Bat (19 calls), Big Brown Bat (one call), and Eastern Pipistrelle (one call). The call sequences in the myotid group could not be identified to species, because the call sequences were too in-

distinct. All of the species identified are found throughout New York State. The survey results (detections and species) were generally consistent with similar studies conducted in the fall in agricultural habitat in the northeast, although a wide range of detection rates have been reported for agricultural land (see Table A-3 in Appendix C).

The detection rates in spring 2007 were lower than in fall 2007 at this site, which was anticipated as bat activity is often greater in the late-summer and fall, based on previous studies conducted in the northeast due to recruitment to the population (e.g., young born in the spring). Please see the discussion on the caveats of detection rates and comparison between sites in Section 3.3.6.1.

For more complete results and discussion on the AnaBat surveys conducted in the fall, see the Woodlot report in Appendix C.

### 3.3.7 Bird Species List and Threatened/Endangered Species

During the bird surveys and other activities in the Project Area, E & E identified a total of 125 bird species in the Project Area (see Table 3-12).

**Table 3-12 Bird Species Identified during E & E Surveys and Site Work in the Ball Hill Project Area**

| Common Name[1] | | |
|---|---|---|
| Canada Goose | Acadian Flycatcher | Blue-winged Warbler |
| Wood Duck | Alder Flycatcher | Nashville Warbler |
| Mallard | Willow Flycatcher | Yellow Warbler |
| Ring-necked Duck | Least Flycatcher | Chestnut-sided Warbler |
| Bufflehead | Eastern Phoebe | Magnolia Warbler |
| Ring-necked Pheasant | Great Crested Flycatcher | Black-throated Blue Warbler |
| Ruffed Grouse | Eastern Kingbird | Yellow-rumped Warbler |
| Wild Turkey | Northern Shrike | Black-throated Green Warbler |
| Common Loon (SC) | Blue-headed Vireo | Blackburnian Warbler |
| Great Blue Heron | Warbling Vireo | Pine Warbler |
| Turkey Vulture | Red-eyed Vireo | Palm Warbler |
| Osprey (SC) | Blue Jay | Bay-breasted Warbler |
| Bald Eagle (T) | American Crow | Black-and-white Warbler |
| Northern Harrier (T) | Common Raven | American Redstart |
| Sharp-shinned Hawk (SC) | Horned Lark (SC) | Ovenbird |
| Cooper's Hawk (SC) | Purple Martin | Mourning Warbler |
| Red-shouldered Hawk (SC) | Tree Swallow | Common Yellowthroat |
| Broad-winged Hawk | Northern Rough-winged Swallow | Hooded Warbler |
| Red-tailed Hawk | Barn Swallow | Scarlet Tanager |
| Rough-legged Hawk | Black-capped Chickadee | Eastern Towhee |
| Golden Eagle (E) | Tufted Titmouse | Chipping Sparrow |

**Table 3-12 Bird Species Identified during E & E Surveys and Site Work in the Ball Hill Project Area**

| Common Name[1] | | |
|---|---|---|
| American Kestrel | Red-breasted Nuthatch | Field Sparrow |
| Merlin | White-breasted Nuthatch | Savannah Sparrow |
| Killdeer | Brown Creeper | Grasshopper Sparrow (SC) |
| Solitary Sandpiper | House Wren | Song Sparrow |
| Spotted Sandpiper | Winter Wren | Swamp Sparrow |
| American Woodcock | Golden-crowned Kinglet | White-crowned Sparrow |
| Ring-billed Gull | Ruby-crowned Kinglet | Dark-eyed Junco |
| Rock Pigeon | Blue-gray Gnatcatcher | Snow Bunting |
| Mourning Dove | Eastern Bluebird | Northern Cardinal |
| Black-billed Cuckoo | Veery | Rose-breasted Grosbeak |
| Yellow-billed Cuckoo | Swainson's Thrush | Indigo Bunting |
| Barred Owl | Hermit Thrush | Bobolink |
| Ruby-throated Hummingbird | Wood Thrush | Red-winged Blackbird |
| Belted Kingfisher | American Robin | Eastern Meadowlark |
| Red-bellied Woodpecker | Gray Catbird | Common Grackle |
| Yellow-bellied Sapsucker | Northern Mockingbird | Brown-headed Cowbird |
| Downy Woodpecker | Brown Thrasher | Baltimore Oriole |
| Hairy Woodpecker | European Starling | Purple Finch |
| Northern Flicker | American Pipit | House Finch |
| Pileated Woodpecker | Cedar Waxwing | American Goldfinch |
| Eastern Wood-Pewee | | House Sparrow |

Note:
[1] Endangered (E) and threatened (T) species and species of special concern (SC) are noted with parenthesis after the common name.

NYSDEC maintains a list of bird species that are considered endangered (nine species), threatened (10 species), or of special concern (19 species) within the state of New York, inclusive of several federally listed species. Information was obtained from various sources, including E & E field surveys, Breeding Bird Atlas projects, and the BOS database of avian records to determine the potential occurrence of endangered, threatened, or special concern species in the Project Area. Table 3-13 lists these species along with notes of possible or confirmed occurrence within the Project Area.

**Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area**

| Listed Species[1,2] | Notes |
|---|---|
| **Endangered Species** | |
| Golden Eagle | It is considered extirpated as a breeder in New York State. It is a rare migrant over the Project Area. Two migrants were observed during E & E raptor surveys in Spring 2008. One adult was observed flying in March of 1993 in Hanover (BOS 2006). |
| Peregrine Falcon | No nests are known to occur in or near the Project Area. It is likely an uncommon migrant over the Project Area. One was observed in Hanover in October of 1999 (BOS 2006). |
| Spruce Grouse | Its New York State range is limited to the Adirondacks, where rare. Location/habitat is not suitable in Project Area. |
| Black Rail | It is extremely rare in New York. There are no records of occurrence in Chautauqua County. Location/habitat is not suitable in Project Area. |
| Piping Plover | It is federally endangered in the Great Lakes region. It is very rare in western New York. Location/habitat is not suitable in the Project Area. There are no records of occurrence in Chautauqua County. |
| Roseate Tern | It is federally endangered. Its New York State range is limited to coastal Long Island. Location/habitat is not suitable in the Project Area. |
| Black Tern | Location/habitat in the Project Area is not suitable for breeding or foraging. There are no records of occurrence in the Project Area. |
| Short-eared Owl | It is a very rare breeder in western New York. There are no records of breeding in Chautauqua County. As evidenced by Fredonia-Dunkirk and Jamestown CBC data, it occasionally winters in the county and may occur in the Project Area. As reported by the NHP, this species was observed in the Town of Sheridan in Chautauqua County near the Dunkirk Airport (Seoane 2006, 2008). Two were observed in December of 1991 in Hanover (BOS 2006). |
| Loggerhead Shrike | It is very rare in New York State and declining. There are no records of occurrence in the Project Area. |
| **Threatened Species** | |
| Pied-billed Grebe | It is an uncommon breeder in Chautauqua County. As evidenced by Fredonia-Dunkirk and Jamestown CBC data, it regularly winters in the county. There are no records of occurrence in the Project Area. |
| Least Bittern | Location/habitat within Project Area is not suitable for breeding. There are no records of occurrence in the Project Area. |
| Bald Eagle | This increasing species occurs as a migrant and transient over the Project Area. Location/habitat within Project Area is not ideal for breeding; however, there are several known nesting areas within 10 miles of the Project Area. E & E observed four individuals during spring raptor surveys in 2007 and 2008, and there have been a number of sightings of adults and immature birds near Lake Erie in the Town of Hanover (BOS 2006). |

**Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area**

| Listed Species[1,2] | Notes |
|---|---|
| Northern Harrier | It has bred in a number of locations in Chautauqua County. It was listed as a possible breeder in BBA block 1569A in or near the Project Area. E & E staff observed this species on several occasions during E & E spring and fall raptor surveys and during spring migratory surveys within the Project Area. |
| King Rail | It is extremely rare in upstate New York. There is only one record of occurrence in Chautauqua County in the Town of Kiantone, approximately 20 miles south of the Project Area. Location/habitat in the Project Area is unsuitable for breeding. |
| Upland Sandpiper | This species has decreased over the last few decades. Although they were not detected during the 2000-2005 BBA, they were listed as confirmed, possible, and probable breeders in a number of blocks in Chautauqua County during the 1980-1985 BBA. There is some habitat (pasturelands) suitable for breeding in the Project Area. Six were observed in Hanover in April 1974, three were observed in Hanover in April 1975, two were observed in Villenova in 1987, and one was observed in Villenova in 1989 (BOS 2006). E & E conducted targeted searches in the Project Area but did not find this species in May or June 2007 or 2008. |
| Common Tern | It is rare in Chautauqua County away from large waterbodies. Location/habitat in the Project Area is unsuitable for breeding or foraging. |
| Least Tern | Its New York State range is limited to coastal Long Island. Location/habitat is not suitable in the Project Area. One of the few regional reports was at Sunset Bay on Lake Erie in the Town of Hanover in May 1993 (BOS 2006). |
| Sedge Wren | There are no records of occurrence in the Project Area. There is some potentially suitable habitat in the Project Area. The NHP reported that this species was observed in the Town of Sheridan and in the Town of Pomfret, both in Chautauqua County (Seoane 2006, 2008). |
| Henslow's Sparrow | The NHP reported that this species was observed in the Town of Arkwright, Chautauqua County (Seoane 2006, 2008). Although they were not detected during the 2000-2005 BBA, they were listed as probable breeders in block 1570C and possible breeders in blocks 1569A and 1570D during the 1980-1985 BBA. There is some potentially suitable habitat in the Project Area. Two were observed in Hanover in April 1972 and two were observed in Hanover in July 1987. E & E conducted targeted searches in the Project Area but did not find this species in May or June 2007 or 2008. |
| **Species of Special Concern** | |
| Common Loon | Location/habitat in the Project Area is not suitable for breeding. It is likely an uncommon migrant over the Project Area. One was observed during E & E raptor surveys on April 23, 2007. |

**Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area**

| Listed Species[1,2] | Notes |
|---|---|
| American Bittern | Location/habitat within the Project Area is not suitable for breeding. One was observed in Villenova in 1987, and one was observed in Hanover in 1991 (BOS 2006). |
| Osprey | It is a migrant and transient over the Project Area. E & E observed this species during the April 22 and 30, 2007, and May 13, 2008 spring raptor surveys. Location/habitat within the Project Area is not suitable for breeding. |
| Sharp-shinned Hawk | It is considered fairly common in Chautauqua County. Location/habitat in the Project Area is suitable for breeding. One was observed in the Project Area on October 5, 2006, during fall raptor surveys and was though to be a migrant; seven were observed on April 23, 2007 and one on May 6, 2008, during spring raptor surveys and were thought to be migrants. |
| Cooper's Hawk | It is considered fairly common in Chautauqua County. Location/ habitat in the Project Area is suitable for breeding. It was considered a possible breeder in BBA block 1569A. Three were observed during 2006 fall raptor surveys, and four were observed during 2007 spring raptor surveys. |
| Northern Goshawk | It is considered a rare breeder in western New York. Location/habitat in the Project Area is suitable for breeding. It was not observed during E & E surveys or field work. It was considered a possible breeder in BBA block 1570B. One was observed in Hanover in March 1978 and one in Hanover in March 1993 (BOS 2006). |
| Red-shouldered Hawk | It is considered fairly common in Chautauqua County. It was considered a possible breeder in BBA block 1570A. E & E observed six on October 5, 2006, during fall raptor surveys in the Project Area, and one on April 23, 2007, during spring raptor surveys. |
| Black Skimmer | Its New York State range is restricted to coastal Long Island. Location/habitat is not suitable in the Project Area. |
| Common Nighthawk | It is a rare and declining breeder in western New York. Site location/habitat is likely unsuitable for breeding. It is likely an occasional spring and late summer migrant over the Project Area. There are no records of occurrence in the Project Area. Three were observed in August 1983 and three were observed in May 1987 in the Town of Hanover (BOS 2006). |
| Whip-poor-will | It is a very rare breeder and migrant in western New York. Location/habitat in the Project Area is likely unsuitable for breeding. There are no records of occurrence in the Project Area. One was observed in May 1999 in Hanover (BOS 2006). |

**Table 3-13 Potential Occurrence of Avian Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area**

| Listed Species[1,2] | Notes |
|---|---|
| Red-headed Woodpecker | It is an uncommon and declining breeder in western New York. Location/habitat in the Project Area is possibly suitable for breeding. There are no records of occurrence in the Project Area. In the Town of Hanover, one was observed in November 1982 and two were observed at a nest in July 1997 (BOS 2006). |
| Horned Lark | It is a regular, often common, species in winter throughout New York State. It likely breeds in low numbers in plowed fields within and near the Project Area. It was listed as a probable breeder in BBA block 1569A. E & E observed several of them as flyovers during spring 2008 raptor surveys. In November 2005, 115 were observed in Villenova (BOS 2006). |
| Bicknell's Thrush | Its New York State range is restricted to the Adirondacks and Catskills, where it breeds in stunted fir forests above 3,000 feet. Location/habitat in the Project Area is unsuitable for breeding. |
| Golden-winged Warbler | Location/habitat in the Project Area is possibly suitable for breeding. One was observed in Hanover in May of 1974, and two were observed in Hanover in May of 1999 (BOS 2006). |
| Cerulean Warbler | Location/habitat in the Project Area is possibly suitable for breeding. None were observed during E & E surveys or site work. There are no records of occurrence in the Project Area. |
| Yellow-breasted Chat | It is an uncommon breeder in western New York. Location/habitat in the Project Area is suitable for breeding. None were observed during E & E surveys or site work. One was observed in Hanover in May 1976 (BOS 2006). |
| Vesper Sparrow | Location/habitat in the Project Area is suitable for breeding. Two were observed in April 2003 in Hanover (BOS 2006). None were observed during E & E surveys or site work. |
| Grasshopper Sparrow | Location/habitat in the Project Area is suitable for breeding. One was detected during E & E breeding bird surveys on June 11, 2007 and one was detected during E & E breeding bird surveys in June 2008. |
| Seaside Sparrow | Its New York State range is restricted to coastal Long Island. Location/habitat in the Project Area is unsuitable for occurrence. |

Notes:
1 All species are state-listed. Federally listed species are indicated in the notes column.
2 Special concern species are not afforded protection under state and/or federal endangered species acts.

### 3.3.8 Bat Species List and Threatened/Endangered Species

During the acoustical monitoring, a total of five bat species in the Project Area were conclusively identified as well as at least one species from the Myotid group of bats (see Table 3-14).

There are two bat species that occur in New York State that are either state- and/or federally listed. The Indiana Bat, which is state and federally protected, and the

Eastern Small-footed Myotis, a state species of concern, have not been identified in the Project Area and are not expected to be present. See Section 3.3.5 for more information on the Indiana Bat. Table 3-15 lists these species along with notes of possible occurrence within the Project Area.

**Table 3-14 Bat Species Identified during Acoustical Monitoring in the Ball Hill Project Area**

| Common Name[1] | Scientific Name |
|---|---|
| Big Brown Bat | *Eptesicus fuscus* |
| Silver-haired Bat | *Lasionycteris noctivagans* |
| Eastern Red Bat | *Lasiurus borealis* |
| Hoary Bat | *Lasiurus cinereus* |
| Eastern Pipistrelle | *Pipistrellus subflavus* |
| Myotid species[1] | |

Note:
[1] Myotid bat species call sequences were identified during acoustical monitoring; however, the call sequence identifications could not be distinguished to species. There are four Myotid bat species that occur in New York State including the Little Brown Bat (most common), Eastern Small-footed Myotis (uncommon; State species of special concern); Indiana Bat (uncommon; Federally- and State-endangered); and Northern Myotis (uncommon to common).

**Table 3-15 Potential Occurrence of Bat Endangered, Threatened, or Species of Special Concern within New York State at the Ball Hill Project Area**

| Listed Species[1,] | Notes |
|---|---|
| **Endangered Species (State and Federal)** | |
| Indiana Bat | There are no records of occurrence in or near the Project Area. Based on the known locations of Indiana Bat hibernacula and the distance that separates these hibernacula from the Project Area, migration through the Project Area is unlikely. See Section 3.3.5. |
| **State Species of Special Concern** | |
| Eastern Small-footed Myotis | There are no records of occurrence in or near the Project Area. Location/habitat in the Project Area is suitable for occurrence. |

Note:
[1] Special concern species are not afforded protection under state and/or federal endangered species acts.

# 4 Risk Assessment

## 4.1 Wind Energy and Bird and Bat Issues

### 4.1.1 Overview

There are a number of beneficial impacts on bird populations that would result from an increased use of renewable energy, including wind energy. Air emissions and global climate change have been cited as serious concerns for North American bird populations (see *A Birdwatcher's Guide to Global Warming by the National Wildlife Federation and American Bird Conservancy* [Price and Glick 2004]). Increased renewable energy use has been cited as one way to slow the rate of climate change and reduce air emissions associated with the increased demand for new energy generation. In addition to the positive impacts noted above, operation of wind energy facilities also has the potential to result in some adverse impacts by causing injury or death to birds through collisions with turbines and by causing habitat loss, degradation, or displacement. While studies have shown that these negative impacts have occurred at a few sites, the results from numerous studies and reviews of impacts on birds from wind energy facilities in North America and Europe indicate that mortality rates are low, especially compared to other sources of bird mortality (Erickson et al. 2001; NWCC 2004; GAO 2005).

In November 2004, the NWCC, a consortium of consumer groups, economic development organizations, electric power, environmental organizations, federal government, green power, state government, tribal governments, and the wind industry, issued the second edition of a fact sheet, "Wind Turbine Interactions with Birds and Bats: A Summary of Research Results and Remaining Questions" (NWCC 2004). The following, taken from the fact sheet, is part of an overview on the status of bird and bat issues at wind energy facilities that aptly describes the current understanding of the issues:

> Wind energy's ability to generate electricity without many of the environmental impacts associated with other energy sources (air pollution, water pollution, mercury emissions, and greenhouse gas emissions associated with global climate change) can significantly benefit birds, bats, and many other plant and animal species. However, the direct and indirect local and cumulative impacts of wind plants on birds and bats continue to be an issue.

In a September 2005 report to congressional requesters, the United States Government Accountability Office (GAO) reviewed the impacts on wildlife from wind power. The GAO report concluded that outside of the Altamont site in northern California, the research to date has not shown bird kills in alarming numbers (GAO 2005). The GAO review of post-construction mortality studies found that bird fatalities ranged from 0 to 7.28 birds per turbine per year. Similarly, the 2004 NWCC fact sheet shows an average of 2.3 birds per turbine per year (3.1 birds per MW per year) are killed at facilities outside of California. For eastern wind farms, the NWCC fact sheet average was 4.3 birds per turbine per year (3.0 birds per MW per year) based on only two studies. No wind energy facilities in New York State were included in the NWCC compilation. However, there have been several studies conducted since the time of the NWCC fact sheet including two years of study from New York State with above average bird fatality rates (see Section 4.4 for more details).

The research regarding impacts to bats from wind turbines is much more limited. Collisions involving bats are typically on the same order as expected for birds with 3.4 bat kills per turbine per year (4.6 bats per MW per year) as the national average from the NWCC fact sheet (NWCC 2004). However, much higher rates (15.3-to-41.1 bats per MW per year) were found during some studies in the Appalachian Mountains and at other locations, including New York State, in recent years (GAO 2005, NRC 2007). The significance of localized bat mortality from collisions on a population as a whole is largely not understood, and current research is being aimed at addressing this issue. The Bats and Wind Energy Cooperative (BWEC), an alliance of state and federal agencies, the wind industry, academic institutions, and non-governmental organizations, is currently researching the interactions of bats and wind turbines with the intent to develop solutions for wind farm siting and mitigation that will minimize or prevent bat mortality from wind turbines. To date, there has been no confirmed correlation between habitat availability and specific atmospheric or seasonal conditions that result in increased mortality, although preliminary data seem to indicate that mortalities occur during periods of lower wind speed and that temperature, precipitation, and humidity may also be contributors (see Section 4.1.3 for more details). No known collisions of federally endangered or threatened bat species have been documented in conjunction with wind turbines (NRC 2007).

Because of the general lack of understanding regarding the interaction of bats and wind turbines, the expectation is that continued monitoring and data analysis associated with operational and proposed windparks will contribute to the database regarding bat species and that windpark operators will need to implement management strategies that will evolve throughout the lifespan of windparks as more defined information is developed. As the breadth of knowledge regarding bat/turbine interactions increases, specific mitigation strategies can be developed to allow for the continued operation of windparks as a critical aspect of a global renewable energy approach, while reducing the potential impact on bats.

A summary of bird and bat fatality rates from post-construction studies at wind energy facilities is included in Appendix F (see Tables F-1 and F-2). There is considerable variation in the search interval, seasonal duration, searcher efficiency, scavenger uptake, wind energy facility size, and geographic location among these studies. Therefore, direct comparison of results is problematic, but the data from these studies represent the best available data for evaluation. The summary tables are derived from the NRC of the National Academy of Sciences report (spring 2007) that reviewed the environmental impacts of wind-energy projects, along with some more recent reports (e.g., Maple Ridge studies). The NRC review of effects to birds and bats included more detail than the NWCC and GAO references, especially for bats, and identified information needs and research recommendations at large. The same post-construction studies were evaluated as the previous references for birds; therefore, there are not updated avian fatality rates. The NRC presented the bat post-construction study data without developing an average fatality rate.

### 4.1.2 Bird Collisions

#### 4.1.2.1 Altitude and Avoidance Affects

Direct collisions with the wind turbine rotors or tower can result in injury or mortality to birds and bats. However, the data from numerous post-construction mortality studies at wind turbine projects demonstrate that avian fatality rates are low (see Appendix F). The low fatality rates are primarily due to three factors:

- Most migrating birds fly at altitudes higher than the maximum turbine height;
- A very high percentage of birds flying toward wind turbines will detect and avoid them; and
- Of those birds that do not alter their flight path in time to avoid the rotor swept area of a turbine, a majority will still avoid a collision.

Some details on these factors are included in the sections that follow.

#### Migration Flight Altitude

Nocturnal avian radar studies, including those conducted in the Project Area, have routinely demonstrated that most nocturnal migrants fly above 120 meters agl, the maximum height of most modern wind turbines (see Tables 3-6 and 3-7 and Appendices A and B).

Birds migrate at varying altitudes, with most in the following ranges (Smithsonian Migratory Bird Center 2006):

- Songbirds: 500 to 6,000 feet, with 75% of songbirds migrating between 500 and 2,000 feet;

- Shorebirds: 1,000 to 13,000 feet;
- Waterfowl: 200 to 4,000 feet; and
- Raptors: 700 to 4,000 feet.

Given the typical altitude ranges of bird migration, only a small percentage of migrating birds are expected to be regularly flying lower than the maximum turbine height and to be at risk of collision with turbine rotors. Weather conditions such as precipitation, low cloud ceilings, and strong opposing winds will usually lower the altitude of migrating birds, putting more birds at risk of a collision. The relationship of poor visibility due to weather conditions and avian collisions with communications towers and buildings has been well studied (Erickson et al. 2001). During nights with low cloud ceiling, fog, and/or precipitation, collision rates at communication towers are higher than during nights with other weather conditions (e.g., Avery et al. 1980). However, fewer birds typically migrate under such unfavorable conditions.

An example of the number of nights with bird migration under unfavorable conditions is provided by a NEXRAD analysis performed for a wind project site along the Lake Erie shoreline in Lackawanna, Erie County, New York, approximately 25 miles north of the Project Area. Over a five-year study period (2002 to 2006), migration patterns in the vicinity of the Site within the rotor swept area and the frequency of unfavorable weather conditions were evaluated. There were more nights in the spring than in fall with weather conditions that could cause birds to fly at low altitudes; however, in both spring and fall, on the vast majority of these nights the amount of migration was greatly reduced (GMI 2007). Over the five years in spring, an average of 10.6 of 55 nights had conditions that might cause birds to migrate at low altitudes (low ceilings and visibility along with precipitation). Of these nights, only an average of 1.6 nights had bird movements of 25 (birds/km$^3$) or greater (GMI 2007). Over the five years in fall, an average of seven of 71 nights had conditions that might cause birds to migrate at low altitudes (low ceilings and visibility along with precipitation). Of these nights, only an average of 0.4 nights had bird movements of 25 birds/km$^3$ or greater (GMI 2007). While these results are site-specific, they offer evidence that there are typically very few nights when birds will migrate under unfavorable conditions that could put them at increased risk of a collision.

### Turbine Avoidance

Various studies of birds approaching wind turbines have demonstrated that most birds detect the presence of wind turbines and react by altering their flight path to avoid them (Sterner 2002; BirdLife 2003; Desholm and Kahlert 2005). In a comparison of flight behavior, one study in Spain found that migrating birds flew at higher average altitudes (>328 feet [100 meters] versus 197 feet [60 meters]) over wind turbines than over areas without wind turbines (Janss 2000). In a study in the Netherlands, Winkelman (1994) observed that at 984 feet (300 meters) from

wind turbines, the change in flight behavior was five times more horizontal than vertical and that 75% of the reactions occurred 328 feet (100 meters) from the turbines. Kahlert et al. (2003) showed some avoidance of an offshore wind farm by birds but emphasized that not enough data had been collected to determine whether the wind farm had or did not have negative effects on migrating bird populations. Desholm and Kahlert (2005) indicated that the radar studies demonstrated a substantial avoidance by migrating waterbirds to a large offshore wind farm with less than 1% flying close enough to the turbines to be at risk of collision. In the Netherlands, Winkelman (1994) found that 1.2% of birds flying at the maximum turbine height were killed. In Belgium, Everaert et al. (2002) calculated the chance of a gull colliding with a turbine to be 0.05% and for a tern 0.2% (BirdLife 2003).

Most of the studies described above were conducted primarily on daytime flying birds and/or from offshore wind farms. Very few visual studies have been conducted at existing wind farms at night; however, the results of nocturnal radar studies can be used to show a high percentage of turbine avoidance among nocturnal migrants. It will take research projects to be conducted with post-construction radar and concurrent mortality studies, to develop a better understanding of the turbine avoidance factor. However, empirically comparing pre-construction radar results to post-construction mortality results does indicate that turbine avoidance is a key factor in the relatively low avian fatality rates exhibited at wind farms. Based on comparison of pre-construction radar passage rates and post-construction mortality results at three wind turbine facilities in the central and western United States, Erickson (2003) estimated that more than 99.99% of birds exhibited behavioral avoidance. Another example that is more recent and closer to the Project Area is the Maple Ridge site in the Tug Hill region of New York State. The turbine passage rate from the ABR pre-construction study at Maple Ridge was 0.7-4.6 nocturnal migrants per turbine per day (Mabee et al 2006b). Assuming for the point of this exercise that all of those nocturnal migrants would collide with the turbine and be found dead during the mortality study would result in approximately 42-to-276 bird fatalities per turbine over the course of the fall migration season (assuming 60 days from August 15 through October 15). The estimates from this exercise are much higher than the post-construction mortality rates of approximately six to 10 birds/turbine/study season [6 to 8 months] obtained during post-construction studies at the site in 2006 and 2007. Granted there are many caveats with such an empirical comparison; however, it demonstrates that there is a high degree of turbine avoidance by nocturnally migrating birds.

Because of site-specific differences in turbines, wind farm layout, weather, bird species, effort, and seasonal duration, these results of the various studies mentioned here cannot be universally applied; however, they demonstrate strong avoidance behavior of turbines by birds in general.

### Rotor Avoidance

For birds that do not alter their flight path when approaching a turbine, studies have documented low collision rates for birds flying through the rotor swept area (the area of the rotating turbine blades). In a direct visual study, Winkelman (1994) observed that 84% of the birds passing through a rotor swept area were not killed. Although there are no empirical data that predict a bird's ability to pass safely through the rotor swept area (but see Desholm et al. 2006 for methods to investigate this behavior), there is a hypothetical model (Tucker 1996). Predictive models based on physics indicate that more than half of the birds passing through a rotor swept area will survive (Tucker 1996) because so little space is occupied by the rotating rotors in relation to the speed of the bird's flight.

Because of site-specific differences in turbines, wind farm layout, weather, bird species, effort, and seasonal duration, these results of the various studies mentioned here cannot be universally applied; however, they demonstrate strong avoidance behavior of turbines by birds in general.

#### 4.1.2.2 Other Factors Affecting Bird Collisions

Several other factors besides altitude, weather, and avoidance have been identified from post-construction monitoring at wind facilities as potential causes for, or associated with, bird mortality.

### Species Groups

Songbirds (passerines) comprise the vast majority of the fatalities associated with on-shore wind turbine projects. In a review of post-construction studies at 31 wind facilities outside of California, Erickson et al. (2001) reported that 78% of the carcasses were songbirds (NRC 2007). Much lesser numbers of species from other bird species groups (e.g., waterfowl, waterbirds, shorebirds, diurnal raptors, owls, and fowl-like birds) have been found during post-construction monitoring. This is consistent with the more-studied communications tower industry. Passerines are typically the most abundant group of birds migrating and residing in an on-shore wind energy project area. Most passerines migrate primarily at night, when collisions are most likely to occur.

### Behavior

The behavior of a bird species can affect the potential impacts of collision through increased exposure to the rotor swept area or by distractions. Although migrants have a brief exposure period to the wind turbines (i.e., generally one pass through the Project Area in migration, versus numerous passes per day or season for a resident bird), migrants are considered to be at somewhat higher risk than residents. Resident birds appear to become habituated to wind turbines and avoid flying in the immediate proximity of them (Winkelman 1985; Janss 2000; Percival 2001). However, some resident bird species are reported as fatalities more often than other resident species, with the primary factor being behavior. Some species (i.e., Horned Lark, Vesper Sparrow, and Bobolink) that perform aerial courtship or territorial displays that put them at an altitude within the rotor swept area have been

the most common fatalities at projects studied in the western and central United States (NRC 2007).

### Seasonal Timing

As migratory songbirds have made up the vast majority of documented bird fatalities at wind turbines, the seasonal timing of bird fatalities is closely connected to migratory periods. As indicated in Section 3.2.1.1, the primary periods in western New York for most songbird migration in spring are mid-April through May and in fall are late August through October.

### Turbine Design

As turbine designs have evolved, the maximum height has increased. Currently, most turbines proposed or installed are in the range of approximately 400 feet agl. Bird fatalities associated with communication towers generally increase with height of the tower and lighting, with greater fatalities at structures greater than 500 feet (152 meters) agl (Kerlinger 2000; Longcore et al. 2005; NRC 2007). It must be noted that most tall communication towers have guy wires installed for support, while modern turbines do not have guy wires. The presence of guy wires greatly increases the potential risk of bird collisions.

### Speed of Rotor

Although faster rotor speed and tip speed appear to be associated with higher mortality, the effects of other design features in comparison have not been studied (Sterner 2002). A few studies have documented that birds react more to operating turbines than stationary turbines (Winkelman 1994; DeLucas et al. 2004).

### Turbine Position and Alignment.

There have been several studies regarding the behavioral effects and mortality from turbine position and alignment within a wind energy facility. However, results have varied and the differences are likely due to site-specific conditions such as topography and the flight behavior of local species. BirdLife International concluded that a string of turbines parallel to the flight line of flying birds, or turbines in a loose cluster, are the best arrangements for a wind turbine farm (BirdLife 2002, 2003).

### Lighting

Studies at communication towers show that migrating birds are attracted to some of the lighting recommended by the Federal Aviation Administration (FAA), especially on nights of poor visibility. Continuous lighting and white lights seem to attract birds. The birds appear to become disoriented and continue to circle the lighted tower instead of continuing in a straight path for migration, greatly increasing their risk of collision. As a result, they end up colliding with the tower, guy wires, or other circling birds. Several studies have suggested that FAA obstruction beacons (slow flashing red lights) do not attract nocturnal migrants and experienced fewer fatalities than towers of similar height with other FAA lighting (Jain et al. 2007).

However, based on available data, there is little evidence to suggest a similar effect with wind turbines (NRC 2007). There have been no documented large fatality events of nocturnal migrants at wind energy facilities, with the largest limited to 27 songbirds at a floodlit substation and nearby turbines in West Virginia on a May (2002) night with heavy fog (NWCC 2004). After this event, the sodium vapor lights were turned off and no subsequent avian fatalities were documented.

### 4.1.3 Bat Collisions

Post-construction surveys of operational wind facilities, especially in the eastern United States, have revealed greater numbers of bat fatalities in recent years. Seasonal trends are showing that migrant tree-roosting bats (Hoary Bat, Eastern Red Bat, and Silver-haired Bat) are the species impacted the most, with nearly 75% of all recovered bat carcasses belonging to these three species (NRC 2007). Impacts to resident bat populations have not been as evident as the impacts on migratory species. There are signs that populations of local bats are less vulnerable and can avoid turbines, even living within and foraging around the proximity of active turbines.

The causes for the large numbers of bat fatalities at some wind energy facilities are poorly understood as this is a relatively recent documented issue. Five factors have been identified from post-construction monitoring at wind facilities as potential causes for, or associated with, the increased bat mortality:

- **Site Characteristics and Location.** Wind turbines placed along forested ridge tops may create or coincide with favorable bat migration corridors. Linear clearings associated with the wind energy facility may be attractive to bats for foraging and put them at increased risk of collision. Several post-construction studies primarily in the mid-Atlantic Highlands of the eastern United States have found the highest reported bat fatality rates. There is uncertainty whether the high fatality rates at these sites in the eastern United States differ from other regions or whether they reflect higher risk, higher abundance of migratory bats, or more intensive search efforts than other regions. Bat kills have also occurred at sites not considered favorable for bat migration (e.g., Alberta prairie).

- **Seasonal Timing.** Bat mortality from wind turbines occurs most frequently during late summer (mid-July through August), within the fall migration period for many bat species. The seasonal distribution and migratory movements of bats are poorly understood. For the three bat species (Hoary Bat, Eastern Red Bat, and Silver-haired Bat) most impacted, the spring migration period is generally between early April and mid-June and the fall migration period is from mid-July through November (Cryan 2003). Migration is a dangerous period for bats because they become more concentrated as they move, making them vulnerable to storms, drought, contaminants, and human disturbance.

- **Weather.** Bat collisions occur with increased frequency on nights with low wind velocity, possibly because flying insects are more active (Arnett et al. 2005). Thermal inversions may also influence the altitude of foraging bats in mountainous areas and place them at greater risk of collision with wind turbines.

- **Attraction to Turbines.** There are various hypotheses that consider bats to be potentially attracted to wind turbines for foraging, roosting, or because of visual or auditory curiosity. The clearings provided by wind turbine construction may create favorable foraging areas for bats to feed on insects. Insects may be attracted to these open areas as well, and possibly, to the heat generated by the turbine nacelle (NRC 2007). Some research explains that bats may have some visual or auditory attraction to tall objects, increasing curiosity and/or the potential for turbines being used as diurnal roost habitat for migrants (Arnett et al.2005). Some theories indicate that bats are attracted to ultrasonic sound emitted by turbines, or the motion of the blades. The "swishing" sound made by the rotation of blades may attract bats, or their prey, increasing the threat for collision (Arnett et al. 2005). Curiosity of the movement in the blades may attract bats to investigate, thus increasing collisions. Wind turbines above any landscape dwarf the surrounding habitats, leaving the suggestion of potential diurnal roost sites. Dead bats were discovered in the open plains of southern Alberta at the Summerview Wind Farm, leaving bat experts baffled as to why bats were impacted in an area not known for great numbers of bats in the first place (Barclay and Baerwald personal communication in NRC 2007). Two species recovered were tree-roosting, highly migrant species (Hoary Bats and Silver-haired Bats) and at the time the wind facility was constructed the area was not known as a migrant corridor for bats.

- **Echolocation Limitations.** There are several factors that may limit the response time and avoidance behavior of bats around turbine rotors. Research currently suggests that bats may not use echolocation capabilities during migration, or that the short distance use for echolocation is ineffective to detect an obstruction in time to react. In other words, bats out fly the return echo. The most efficient range of echolocation differs from 3 to 5 meters, in most North American bats (Arnett et al. 2005). Turbine rotors and the nacelle produce complex electromagnetic fields that may interfere with echolocation activities. Researchers are attempting to deter bats from wind turbine blades using high altitude sonar "jamming" sounds from devices placed around wind facilities. Studies have shown bats to avoid areas with high intensity sound and over time they remember and will continue to avoid the area (Szewczak and Arnett 2006).

### 4.1.4 Habitat Loss, Degradation, or Displacement

There is also a potential that habitat disturbance from wind turbines may result in habitat loss, habitat degradation through fragmentation (i.e., the loss of quality or

quantity of habitat), or result in behavioral displacement from habitats. These impacts have occurred in certain instances at wind turbine facilities (e.g., Leddy et al. 1999, Spaans et al. 1998, and Winkelman 1992a in BirdLife 2003). The magnitude of disturbance will depend on site differences in topography, type of vegetation, presence of existing roads, historic land use, and size and arrangement of turbines (NRC 2007). The disturbances can be temporary (i.e., during construction) or permanent.

Responses of birds to changes in habitat likely vary by species (NRC 2007). For example, edge species, such as the Indigo Bunting and Mourning Warbler may benefit from habitat disturbance; whereas, forest-interior species, such as the Ovenbird, may be displaced. Some studies have documented decreased breeding densities, primarily in grassland-nesting songbirds, in proximity to wind turbines (Leddy et al. 1999). However, other studies have documented little impact on nesting birds and that some birds or species groups habituate to the areas around the turbines (e.g., Winkelman 1992b in BirdLife 2003, Brown and Shepherd 1993 in BirdLife 2003; NWCC 2004). In general, the response of displacement of forest-dwelling birds by turbines has not been well studied by the agencies, wind industry, or academia. For this Project Area, most of the forested areas have already been fragmented and/or are destined for silviculture.

Changes in vegetation may influence the behavior of bats by changing microclimatic conditions and the quality of habitat for foraging or roosting bats through the removal of vegetation (NRC 2007).

## 4.2 Potential Impacts on Birds and Bats from Construction

Construction-related activities (i.e., clearing for road construction, infrastructure construction, equipment noise, and increased vehicle traffic) can potentially impact birds and bats by causing temporary displacement from habitat. Because these impacts are generally only temporary in nature, impacts on bird and bat populations are not significant.

### 4.2.1 Potential Impacts on Migratory Birds

Significant adverse impacts on migratory bird populations including raptors, passerines, and waterbirds are not expected as a result of construction of the Project. The Project Area is not located along a major migratory corridor for birds. Most species are expected to avoid the area of construction during construction activities. When no construction is occurring (i.e., evenings, weekends), it is anticipated that migratory birds would continue to use the area for migration.

### 4.2.2 Potential Impacts on Breeding Birds

Breeding bird populations are not expected to be adversely affected significantly by construction of the Project. If construction begins before the breeding season, it is anticipated that breeding birds will likely avoid areas during the active con-

struction period. If construction begins during the breeding season, breeding birds that have been exposed to similar disturbance such as farming and logging, and are accustomed to disruption of this nature will remain in the area while others will likely relocate to other adjacent suitable habitat, if available. Incidental loss of some nests, eggs, and/or young is possible when construction (land clearing, etc.) is conducted during the breeding season. Indirect impacts on breeding birds will occur as a result of habitat alteration during construction of the Project; however, these impacts are not expected to be significant because other suitable habitat that will not be disturbed exists in the Project Area. The potential for habitat loss has been minimized because of site planning (i.e., the placement of turbines in agricultural areas where possible). Outside of localized construction disturbance, no significant adverse impacts on breeding birds are anticipated.

### 4.2.3 Potential Impacts on Threatened and Endangered Species

Based on consultation with the USFWS, the Bald Eagle was identified as occurring in Chautauqua County, which although no longer protected under the ESA is federally protected under the Bald and Golden Eagle Protection Act. The NHP did not identify any threatened or endangered species within the Project Area (Seoane 2006, 2008). The NHP identified five state-listed and one protected bird species within 10 miles of the Project Area: Great Blue Heron, Bald Eagle, Short-eared Owl, Sedge Wren, Henslow's Sparrow, and Northern Harrier (Seoane 2008). The Short-eared Owl is a state-listed endangered species, while the Bald Eagle, Sedge Wren, Henslow's Sparrow, and Northern Harrier are state-listed threatened species. Great Blue Heron was identified by the NHP due to the Project Area's proximity to a rookery. During field surveys one state-endangered species (Golden Eagle), two state-threatened species (Bald Eagle and Northern Harrier) and seven state special concern species (Common Loon, Osprey, Sharp-shinned Hawk, Cooper's Hawk, Red-shouldered Hawk, Horned Lark, and Grasshopper Sparrow) were observed in the Project Area; all in low numbers.

Based on surveys and observations of existing habitat in the Project Area, only limited use of the Project Area is anticipated by endangered, threatened, and special concern species during construction. Most occurrences would likely be related to migration or transient (i.e., limited) use. Species which may breed in the Project Area are likely to occur in very low numbers and the potential for impacts during construction will be minimized by the use of environmental monitors and adaptive management strategies. Of the listed species mentioned previously in this section, disruption during construction (e.g., land clearing) in the breeding season could potentially affect Northern Harrier, Sharp-shinned Hawk, Cooper's Hawk, Red-shouldered Hawk, and Grasshopper Sparrow because those are the listed species most likely to breed within the Project Area. It is anticipated that environmental monitoring in grasslands habitat (Northern Harrier and Grasshopper Sparrow) and forested areas (Sharp-shinned Hawk, Cooper's Hawk, and Red-shouldered Hawk) will identify nesting areas and reduce any potential impacts during construction. Transient and/or migratory use by the other listed species is not expected to result in adverse impacts during construction.

If construction takes place in suitable nesting habitat for endangered or threatened species in the spring to early summer - during breeding season - the work area will be surveyed and cleared by an environmental monitor in advance of construction as per Noble's environmental monitoring plan (see DEIS Section 2.27 and DEIS Appendix U). If nesting threatened or endangered species are found in the immediate proximity of a construction area, Noble will coordinate with the USFWS and/or NYSDEC to identify potential impacts, evaluate options, and to develop a mitigation plan to address site-specific occurrences of species of concern. Measures that may be implemented will depend on the proximity to construction, the construction activities involved, the species involved, the date, the stage of the breeding season, and other potential factors (e.g., hay mowing). It is possible that measures may include delaying construction in the immediate area until the young have fledged from the nest or continual monitoring during the initial construction period to ensure that the birds are not impacted. With implementation of monitoring activities, no significant adverse impacts from construction on threatened or endangered species are anticipated.

### 4.2.4 Potential Impacts on Bats

Significant adverse impacts on bat populations are not expected during construction of the Project. There is a potential for indirect impacts on bats as a result of habitat alteration or loss in association with construction of the Project; however, these impacts are not expected to have a significant adverse affect on bat populations. Potential construction impacts on habitat would be caused by ground disturbance and tree removal activities that are also associated with farming and logging activities that are common to the area. It is anticipated that bats in the Project Area would return to temporarily disturbed areas upon completion of construction.

## 4.3 Potential Impacts on Birds and Bats from Operation of the Project

Operation of the wind turbines can potentially impact birds and bats through collisions with the turbine blades and towers, overhead collection lines and transmission lines, displacement from habitat, or influence on migration, etc. Collisions are typically the primary concern with operation-related impacts. Potential impacts can vary among different bird and bat populations and groups.

### 4.3.1 Potential Impacts on Migratory Birds

The dynamics of migration and the potential impacts from the operation of wind turbines differ among groups of birds. Therefore, this section contains separate discussions of potential impacts on the migration of raptors, passerines, and waterbirds. The majority of passerines migrate during the night while raptors migrate almost exclusively during the day. Waterbirds migrate during the day and night (Richardson 1998).

### Raptors

Raptor migration is diffuse in the region away from the Great Lakes shorelines. There are no geographical or topographical features in the Project Area that attract or concentrate migrating raptors. The Project Area is just beyond the recognized raptor migration pathway between Lake Erie shoreline and the Portage Escarpment. No concentrated flight paths were identified in either spring or fall and the findings were consistent with the existing knowledge of the bird resources in the region. Therefore, low numbers of migrant raptors are anticipated in the Project Area.

Concerns about raptor impacts from wind turbines persist from the continued fatalities occurring at the Altamont Pass in California and other older wind farms in that state. However, several site-specific features at Altamont Pass contribute to the number of raptor deaths including older turbines that allow raptors to perch and nest on lattice structures; the large number of turbines (over 5,000); and an abundant source of prey, all of which contribute to a large number of raptors in the area (GAO 2005). Large numbers of raptor kills have not occurred at wind farms elsewhere in the United States outside of California, and raptor fatalities have ranged from 0 to 0.07 raptors per turbine per year (GAO 2005). Raptor fatalities have been limited at eastern sites where post-construction mortality monitoring has been conducted.

As raptor use in the Project Area is low and the likelihood of turbine avoidance is high, the potential for impacts is very low. No biologically significant adverse impacts on migrant raptors are anticipated from operation of the Project.

### Passerines

A collision risk exists for nocturnal migrant passerines at all tall structures, including wind turbines. Nocturnal migrant passerines comprised the greatest number of bird fatalities (34% to 59%) in a review of post-construction mortality studies by Erickson et al. (2001). However, there have been no documented large fatality events of nocturnal migrants at wind energy facilities, with the largest limited to 27 songbirds at a floodlit substation and nearby turbines in West Virginia on a May night with heavy fog (NWCC 2004).

There are no geographical or topographical features in the Project Area that attract or concentrate nocturnal migrant passerines. The Project Area is not immediately proximate to any large water bodies where nocturnal migrants tend to concentrate at stopover areas. Outside of such concentration areas, passerine migration is typically diffuse over a broad front. Results of the nocturnal radar study are generally consistent with this assessment. The migratory passage rates over the Project Area in fall 2006 were below average and in spring 2007 were above average but both were within the values of studies conducted at other locations.

The mean flight altitudes were 768 feet (235 meters) and 1,230 feet (375 meters) higher than the maximum turbine height in fall 2006 and spring 2007, respec-

tively; therefore, the majority of nocturnal migration occurs well above the height of the proposed turbines. The mean flight altitudes in spring and fall are similar to each other and are similar to other locations in the east where similar studies have been conducted. Approximately 9% of all nocturnal targets in fall 2006 and approximately 3% of all nocturnal targets in spring 2007 flew below 394 feet (120 meters) agl, a close approximation to the maximum turbine height. These findings are within the range of results from other radar studies in the northeast.

There are conditions when nocturnal migrants will be more susceptible to collision. There is an increase for potential impacts when adverse weather conditions cause birds to fly at lower altitudes. Studies have shown that bird collisions with communication and television towers (much taller than wind turbines) are increased during low cloud ceilings, heavy fog, and precipitation.

It is likely that nocturnal migrant passerines will make up the majority of bird kills from the Project. However, the potential mortality risk to migrant passerines is considered low based on the Project location, the passage rate and altitude data from the radar studies (and other regional radar studies), the avoidance behavior of passerines exhibited at wind energy facilities, and as demonstrated by the fatality rates from post-construction monitoring at regional wind energy facilities. No biologically significant adverse impacts are anticipated for any species from operation of the Project.

#### Waterbirds

The Project Area is not located in an area where there are large numbers of migratory waterbirds or local movements. Post-construction studies at existing wind energy facilities have shown that waterfowl are less susceptible to collision than other species groups (Erickson et al. 2002; BirdLife 2003). Therefore, the potential risk for waterbird mortality from the Project is estimated to be very low.

Impacts to migrating birds will be identified during the post-construction study for bird and bat mortality monitoring.

### 4.3.2 Potential Impacts on Breeding Birds

Given the various habitats in the Project Area and site geography, there is a good diversity of breeding species; however, many turbines (e.g., approximately 66%) will be sited in agricultural fields and open areas which already have a relatively low species diversity and density (see Tables E-12 and E-13). There is a significant degree of habitat fragmentation already in the Project Area. By minimizing the Project footprint near wetlands and mature forests, potential impacts on resident birds have been reduced.

Much of the Project will be constructed in agricultural and young woodland areas, and breeding birds in these habitats may demonstrate temporary displacement. Most breeding birds are anticipated to habituate to the turbines and long-term displacement will be minimal. Grassland-nesting species may not habituate to the

turbines as much as species in other habitats, although displacement may be limited to the immediate area (e.g., surrounding field) of each turbine depending on a site-specific basis as per turbine location, habitat, size of field, hay mowing, and pesticide practices. Any potential impacts to grassland-nesting species are anticipated to be much less than the impacts from existing hay mowing and pesticide practices in the same area, as well as the conversion of previously inactive fields for agricultural production.

Project facility construction in wooded areas could result in some forest fragmentation and negatively impact some forest-dwelling species (i.e., Wood Thrush, Ovenbird); however, there are not any extensive forest tracts in the Project Area and fragmentation is already prevalent. Some avian species (i.e., Indigo Bunting, Mourning Warbler) may benefit from fragmentation. Long-term displacement in wooded areas is unlikely as breeding species are anticipated to habituate to the turbines.

There is a low risk of any substantial negative impact on habitat through loss, degradation, or displacement of breeding birds. No significant adverse impacts on breeding birds are anticipated from operation of the Project.

### 4.3.3 Potential Impacts on Threatened and Endangered Bird Species

Based on consultation with the USFWS, the Bald Eagle was identified as occurring in Chautauqua County, which although no longer protected under the Endangered Species Act (ESA) is federally protected under the Bald and Golden Eagle Protection Act. The NHP did not identify any threatened or endangered species within the Project Area (Seoane 2006, 2008). The NHP identified six state-listed bird species within 10 miles of the Project Area: Great Blue Heron, Bald Eagle, Short-eared Owl, Sedge Wren, Henslow's Sparrow, and Northern Harrier (Seoane 2008). The Short-eared Owl is a state-listed endangered species, while the Bald Eagle, Sedge Wren, Henslow's Sparrow, and Northern Harrier are state-listed threatened species. Great Blue Heron was identified by the NHP due to the Project Area's proximity to a rookery.

During field surveys, one state-endangered species (Golden Eagle), two state-threatened species (Bald Eagle and Northern Harrier), and seven state special concern species (Common Loon, Osprey, Sharp-shinned Hawk, Cooper's Hawk, Red-shouldered Hawk, Horned Lark, and Grasshopper Sparrow) were observed in the Project Area; all in low numbers. Only limited use of the Project Area is anticipated by endangered, threatened, and special concern species. Therefore, no significant adverse impact on these species is expected during operations. The potential impacts on these species and those additional species listed by USFWS and NYSDEC on the NHP reports (i.e., Great Blue Heron, Short-eared Owl, Sedge Wren, and Henslow's Sparrow) within 10 miles of the Project Area are discussed in detail below.

Two migrant Golden Eagles were observed in the Project Area by E & E staff during the spring raptor surveys on March 30 and April 7, 2008. There is no suitable habitat for breeding in the Project Area and there are no active nests in New York State (NYSDEC 2007c). There are no activities pertinent to the life cycle of the Golden Eagle that would regularly bring it to the Project Area except as a rare migrant or an occasional transient. With such low utilization of the Project Area, the potential direct mortality or injury of eagles colliding with wind turbines is considered remote. Similarly, as there is not suitable breeding habitat in the Project Area, the potential for harassment, displacement, or habitat impacts are also remote. Therefore, any potential adverse impacts to Golden Eagle are considered remote.

Two Bald Eagles were observed by E & E staff in the Project Area during spring raptor surveys in 2007 (one migrant on April 23, 2007 and one local bird on April 30, 2007). Two Bald Eagles were also observed during 2008 spring raptor surveys (one migrant and one local bird, both on April 7, 2008). Habitat within the Project Area is not suitable for breeding; however several nesting areas have been identified within 10 miles of the Project Area, including one nest just east of the Project Area at Lake Flavia in the Town of Dayton. Foraging potential for Bald Eagles within the Project Area is considered low given the absence of any large bodies of water in the Project Area. Based on suitable foraging habitat and relative proximity to the nearest nesting locations, Bald Eagles may visit East Mud Lake and West Mud Lake, which are both adjacent to the Project Area. Coming from the nearest nesting locations, the eagles could reach these small lakes without crossing the Project Area. There are no activities pertinent to the life cycle of the Bald Eagle that would regularly bring it to the Project Area except as a migrant or a transient. As such, the potential for direct mortality or injury to Bald Eagles from colliding with wind turbines is low. Similarly, the potential for harassment, displacement, or habitat impacts are also low. Therefore, any potential adverse impacts to Bald Eagle are considered low.

E & E staff observed Northern Harriers in the Project Area on several occasions during spring and fall raptor surveys and spring migratory surveys. It has bred in a number of locations in Chautauqua County and is a regular occurrence in many other areas of New York State. It is a confirmed or suspected breeder in or near the Project Area. Various wetland and upland habitats, including cattail marshes, wet meadows, and hayfields, are used for nesting. Unlike most raptors, it is a ground nester. It is highly visible in all seasons and has a large hunting range (Andrle and Carroll 1988). Because there is ample suitable nesting habitat in and near the Project Area, the potential risk of displacement is low. Very low Northern Harrier mortality has been documented from wind turbines, even at sites that have relatively high use by this species (Erickson et al. 2002). It is anticipated that local Northern Harriers will habituate to the presence of wind turbines; however, the collision risk is considered low-to-moderate because of the species' frequency of occurrence in the Project Area.

Short-eared Owl has been listed by NHP as occurring in the Town of Sheridan in Chautauqua County. This location is assumed to be a wintering location rather than a breeding area, because this species is a very rare breeder in western New York and no breeding has been documented in Chautauqua County. In addition to the NHP listing, two Short-eared Owls were observed in Hanover, NY in 1991. This species is categorized as endangered in New York State primarily because of its rare breeding status and decline in population. Although breeding Short-eared Owls are very rare in western New York, wintering Short-eared Owls are regular. Suitable habitat occurs throughout much of Chautauqua County, including the Project Area, for wintering Short-eared Owls. Short-eared Owls have been observed in five out of 35 years during the Dunkirk-Fredonia CBC and seven out of 66 years during the Jamestown CBC. Although this species was not observed during field surveys, it is suspected that a few birds may forage in the Project Area in some winters. The potential impact to this species is considered low.

Sedge Wren has been identified by NHP as occurring in the Town of Sheridan in Chautauqua County. Typical breeding habitat consists of moist sedge meadows, commonly with grasses and scattered shrubs (Andrle and Carroll 1988). This elusive species is unpredictable, as it often does not reappear from year to year in the same breeding location. Habitat is often temporary and replaced through plant succession (Andrle and Carroll 1988). The Sedge Wren is secretive and spends most of its time near the ground, with limited flights just above the vegetation. The potential risk of collision is considered remote and the potential risk of displacement is considered very low because suitable habitat will not be altered and the unpredictable nature of its breeding.

Henslow's Sparrow has been identified by NHP as occurring in the Town of Arkwright, Chautauqua County, approximately six miles west of the Project Area. Typical breeding habitat consists of wet grasslands with tall, dense vegetation and thick litter (Herkert et al. 2002). The Henslow's Sparrow is secretive, singing from inconspicuous perches on low forbs, shrubs, or grasses. The potential risk of collision is considered remote and the potential risk of displacement is considered very low because suitable habitat will not be altered.

Great Blue Heron has been identified by NHP because a rookery with more than 50 nests per year has been observed at Dibble Hill/Farrington Hollow in the Town of Arkwright, Chautauqua County, approximately two miles west of the Project Area. While not a federal or state listed endangered or threatened species the Great Blue Heron is protected by the federal Migratory Bird Treaty Act. The Great Blue Heron typically nests in colonies, usually near water; and is primarily a fish eater, wading along the shorelines of marshes, lakes, and rivers (Butler 1992). There are numerous foraging areas near the heronry including the Canadaway Creek WMA, Canadaway Creek and multiple tributaries, Black Pond, West Mud Lake, Fredonia Reservoir, Cassadaga Lake, and various other streams and tributaries. There are relatively few creeks and ponds within the Project Area, although herons could traverse the Project Area if they wanted to forage at East Mud Lake,

Silver Creek Reservoir, or the north branch of Conewango Creek, all located east or northeast of the Project Area. While it is not a state- or federally-listed species, Noble's environmental monitoring program (see DEIS Section 2.27 and DEIS Appendix U) would determine if they are present during the construction year in close proximity to construction and will be handled accordingly. Herons have not been prone to collisions with wind turbines and given their size, they would be easier to find than smaller birds such as passerines during post-construction mortality studies. In a review of bird collisions at wind facilities (Erickson et al. 2001) based on 31 studies, 78% of the carcasses found (outside of California) were passerines and only 3.3% were waterbirds (National Research Council 2007). The potential risks of collision and displacement is considered low, as there is little suitable breeding or foraging habitat in the Project Area.

Species of special concern are those that warrant attention and consideration because they are extremely uncommon in New York or have highly specific habitat requirements and deserve careful monitoring. Although rare, current information does not justify listing these species are either endangered or threatened. They are not warranted the same legal protection as those species which are listed as endangered or threatened. All of these species were detected in very low numbers, therefore the potential risks of collision and displacement are considered remote.

Only limited use of the Project Area is anticipated by endangered, threatened, and special concern bird species; therefore, the overall risk to threatened and endangered bird species from operation of the Project is considered low. Impacts to listed bird species will be identified during the post-construction study for bird and bat mortality monitoring.

### 4.3.4 Potential Impacts on Bats

Based on the habitat within the Project Area, acoustical monitoring studies performed in and near the Project Area, and the limited post-construction data associated with other similar projects, the potential for significant adverse impacts on bats from operation of the Project is considered moderate as uncertainty still remains regarding the affect of wind farms on bats. A primary reason for uncertainty is that pre-construction bat studies have not been effective at indicating post-construction impacts at many sites, including the Maple Ridge site in New York State.

The greatest concern for potential adverse impacts would be to transient individuals, especially tree-roosting bat species (Hoary Bat, Eastern Red Bat, and Silver-haired Bat) colliding with wind turbines. Preliminary data collected at sites in the eastern United States as well as several western sites (U.S. and Canada) seem to indicate that these species are susceptible to collisions with wind turbines. It is anticipated that there would be much lower risk to the resident/summering populations occurring in the Project Area than to migrants because collisions with tree-roosting migrating species have exceeded those of other bat species (e.g., 151 of

203 total dead bats found during the 2007 post-construction study at Maple Ridge were of the three tree-roosting bat species mentioned above [Jain et al. 2008]).

As the population sizes and trends and migratory patterns of most bats in New York State are unknown, it is uncertain what level of impact is made from wind projects, especially in light of the even greater mortality risk from WNS. However, it should be noted that WNS has yet to be documented in western New York and therefore at this time, is not expected to impact local bat populations.

### 4.3.5 Potential Impacts on Threatened and Endangered Bat Species

The known occurrence and distribution of Indiana Bats in New York State are described in Section 3.3.5. Within New York State, the Indiana Bat is known to winter only in isolated hibernacula mostly within the eastern portion of the state. Based on the known locations of hibernacula and maternity colonies in New York State, and no previous documentation of this species in western New York, it is unlikely that Indiana Bats would be found residing or migrating in the Project Area, and, therefore, any potential impacts are considered remote.

## 4.4 Bird and Bat Fatality Approximations

### 4.4.1 Birds

NWCC compiled regional and overall bird fatality rates based on 12 post-construction mortality studies that were conducted for a minimum of three seasons and where scavenging and searcher efficiency biases were incorporated into the estimates (NWCC 2004). The overall national average was 2.3 birds/turbine/year, ranging from 0.6 to 7.7 birds/turbine/year. The eastern regional average, based on only two studies, was 4.3 birds/turbine/year. Many of the studies included in the evaluation are from the western United States, where there is typically less passerine migration than most locations in the eastern United States.

No wind energy facilities in New York State were included in the NWCC compilation as none of the few studies to date met the duration or methodology requirements for inclusion. The results of mortality studies conducted at several facilities in New York State or nearby are described below. The studies conducted at Maple Ridge were more rigorous than the others.

- The most extensive mortality studies in New York State with published results to date were the 2006 and 2007 studies at the Maple Ridge Wind Power Project (formerly known as the Flat Rock Power project), located on the Tug Hill Plateau of Lewis County, New York. Project construction was initiated in 2005 and the project consists of 195 turbines for a total of 322 MW. A pre-construction nocturnal radar and visual study was conducted at the site in fall 2004 by ABR (see Table 3-6 for comparison of results). A pilot post-construction mortality study was initiated in 2006 with 50 turbines and two met towers searched regularly on either a daily basis, every three days, or weekly from June 17 through November 15 (Jain et al. 2007). A total of 125

bird fatalities of a mix of 30 species were documented during the 2006 surveys (Jain et al. 2007). Fatality estimates for birds varied based on the three survey durations with 9.59 incidents/turbine (daily surveys), 4.47 incidents/turbine (every 3-day surveys), and 3.13 incidents/turbine (weekly surveys) (Jain et al. 2007). In 2007, 64 turbines and two met towers were searched weekly from April 30 through November 14 (Jain et al. 2008). A total of 64 bird fatalities of a mix of 21 species were documented. Bird fatality estimates in 2007 were 5.67 incidents/turbine.

- A one-year post-construction mortality study at the Madison County facility (seven turbines, 11.6 MW) found four dead birds, at a fatality rate of 0.42 birds/turbine/year (Kerlinger and Guarnaccia 2006).

- No dead birds were found at the Wethersfield wind farm, Wyoming County, facility (10 turbines at 290 feet agl, 6.6 MW) during a post-construction mortality study conducted by E & E in 2005. Searches were conducted approximately every other day from May 9 through June 3, 2005 and from August 15 through October 14, 2005.

- Five dead birds were found at the Steel Winds facility in Lackawanna, Erie County (8 turbines at 425 feet agl, 20 MW) during a post-construction mortality study conducted by the Buffalo Museum of Science in 2007 (Grehan 2008). Searches were conducted 16 times between April 3 and October 16, 2007. The facility turbines were not operational during a portion of the season.

- A total of 59 dead birds were found at the Erie Shores wind farm in Port Burwell, Ontario (66 turbines, 99 MW) during a two-year post-construction mortality study conducted in 2006 and 2007 (James 2008). Turbine locations are between 150 meters and 2.5 kilometers from the Lake Erie shoreline. Searches were conducted approximately at least once in March, every week for six weeks in spring (May through early June), and over 12 or more weeks in autumn (mid-August through early November). Adjusted overall estimated mortality was approximately 2 to 2.5 birds/turbine/year. Bird mortality was highest at nine turbines located 200 meters or closer to the shoreline. Excluding those nine turbines, the overall estimated mortality would be approximately 0.5 to 0.6 birds/turbine/year.

- No dead birds were found during a 6-month mortality study at the Searsburg, Vermont facility (11 turbines, 6 MW) (Kerlinger and Guarnaccia 2006).

- The Huron Wind site, five turbines located along Lake Huron in Ontario, Canada, has had only one known bird mortality since 1995 (Huron Wind 2006).

- Only two dead birds were found during a mortality study at a single turbine in the city of Toronto, Canada, along the Lake Ontario waterfront (James and Coady 2003).

It is anticipated that the bird fatality rates for the Project will be within the range of the NWCC eastern average and 2006 Maple Ridge daily results. This prediction is based on the results of the bird studies, literature review, and because there are no features in the Project Area that attract or concentrate large numbers of migrating birds.

The potential number of fatalities for the Project was estimated by multiplying the fatality rates for bird kills with the proposed number of turbines (see Table 4-1). For this approximation, the NWCC eastern average was used as a lower bound and the 2006 Maple Ridge daily results were used as an upper bound. The NWCC eastern average is only based on two studies, including one study at a site in Tennessee with only three turbines. However, it is anticipated that sites in the eastern United States will have higher avian fatality rates than sites in the western and central United States. Thus, the NWCC eastern average was used as the lower bound. The 2006 Maple Ridge daily and 3-day avian fatality rates were higher than the NWCC eastern average (and also the 2007 Maple Ridge rates) but may have resulted from more thorough surveys, among many other possible site-specific variations. With a similar post-construction survey methodology proposed for the Noble Allegany project, it is reasonable to anticipate that similar results could occur. Therefore, the 2006 Maple Ridge daily avian fatality rate is selected as the upper bound of the estimate. These are only estimates and there can be considerable variation in fatality rates. The number of bird fatalities can only be determined with post-construction mortality studies; however, this estimate allows an evaluation of the potential impacts.

**Table 4-1 Approximate Number of Bird Fatalities for Project**

| Project | Number of Turbines | Lower Bound: Approximate Bird Fatalities Per Year Based on NWCC Eastern Average Rate[1] | Upper Bound: Approximate Bird Fatalities Per Year Based on 2006 Maple Ridge Daily Rate[2] |
|---|---|---|---|
| Noble Ball Hill | 60 | 258 | 576 |

Notes:
[1] 4.3 birds/turbine/year (NWCC 2004).
[2] 9.59 birds/turbine/survey season (Jain et al. 2007).

### 4.4.2 Bats

Historically the average number of bat kills from wind turbines has varied from facility to facility and was considered a function of a number of factors including the proximity to hibernacula, known migration corridors, and topography. Until the Mountaineer site bat kills in 2003 and 2004, the average had remained low, approximately fewer than three bats/turbine/year killed (BCI 2007). The NWCC national average grew to approximately 3.4 bats/turbine/year with the inclusion of the 2003 Mountaineer results of 47 bats/turbine/year (NWCC 2004) and this aver-

age is likely to increase as more post-construction mortality study results become available (e.g., Maple Ridge site).

No wind energy facilities in New York State were included in the NWCC compilation as none of the few studies to date met the duration or methodology requirements for inclusion. The results of mortality studies conducted at two facilities in New York State and a facility in Ontario on the Canadian shore of Lake Erie include the following:

- The most extensive mortality studies in New York State with published results to date were in 2006 and 2007 at the Maple Ridge Wind Power Project. A preconstruction nocturnal radar and visual study was conducted at the site in fall 2004 by ABR (see Section 3.3.1 for comparison of results). A pilot post-construction mortality study was initiated in 2006 with 50 turbines and two meteorological towers searched regularly on either a daily basis, every three days, or weekly from June 17 through November 15 (Jain et al. 2007). A total of 326 bat fatalities from five species were documented during the 2006 surveys (Jain et al. 2007). Approximately 70% of the fatalities were documented during the fall migration period (July and August). Fatality estimates for bats varied based on the three survey durations with 24.53 incidents/turbine (daily surveys), 22.34 incidents/turbine (every 3-day surveys), and 15.20 incidents/turbine (weekly surveys) (Jain et al. 2007). In 2007, 64 turbines and two met towers were searched weekly from April 30 through November 14 (Jain et al. 2008). A total of 202 bat fatalities of a mix of five species were documented. Bat fatality estimates in 2007 were 15.54 incidents/turbine.

- Four dead bats (two Little Brown Bats and two unidentified bats) were found at the Wethersfield wind farm, Wyoming County, facility (10 turbines at 290 feet agl) during a post-construction mortality study conducted by E & E (2006) in 2005. Searches were conducted approximately every other day from May 9 through June 3, 2005 and from August 15 through October 14, 2005.

- A total of 48 dead bats were found at the Steel Winds facility in Lackawanna, Erie County (8 turbines at 425 feet agl, 20 MW) during a post-construction mortality study conducted by the Buffalo Museum of Science in 2007 (Grehan 2008). Searches were conducted 16 times between April 3 and October 16, 2007. Most bats were found during the month of August. The facility turbines were not operational during a portion of the season.

- The overall estimated mortality for bats at the Erie Shores wind farm in Port Burwell, Ontario (66 turbines, 99 MW) during a two-year post-construction mortality study conducted in 2006 and 2007 was approximately 4.5 to 5.5 bats/turbine/year (James 2008). Searches were conducted at least once in March, every week for six weeks in spring (May through early June), and over 12 or more weeks in autumn (mid-August through early November). Bat mortality was highest at nine turbines located 200 meters or closer to the shore-

line. Excluding those nine turbines, the overall estimated mortality would be approximately 2 to 2.5 bats/turbine/year.

It is anticipated that the bat fatality rates for the Project will be above the NWCC national average (3.4 bats/turbine/year). Because the NWCC national average does not feature many eastern sites, where bat kills have been more numerous, or recent studies where more thorough search methodologies have revealed increased fatality rates (i.e., 2006-2007 surveys at Maple Ridge), it is reasonable to anticipate that fatality rates greater than the NWCC national average might occur.

To present a possible range of estimates, the NWCC national average was used as the lower bound while the 2006 daily survey rate at Maple Ridge was used as the upper bound. The 2006 daily survey rate at Maple Ridge was selected because it is the highest rate from New York State, even though migratory bat abundance in the Project Area may be less than that at Maple Ridge. Multiplying the NWCC national average and the 2006 Maple Ridge daily fatality rates for bat kills with the proposed number of turbines provides an approximate number of bat fatalities for the Project (see Table 4-2). However, this range is only an estimate and the number of bat fatalities could be higher or lower, as it is difficult to predict whether large scale fatality events will occur at a specific site based on preconstruction studies and there can be considerable variation in bat fatality rates. The number of bat fatalities can only be determined with post-construction mortality studies; however, this estimate allows an evaluation of the potential impacts.

**Table 4-2 Approximate Number of Bat Fatalities for Project**

| Project | Number of Turbines | Lower Bound: Approximate Bat Fatalities Per Year Based on NWCC National Average Rate[1] | Upper Bound: Approximate Bat Fatalities Per Year Based on 2006 Maple Ridge Daily Rate[2] |
|---|---|---|---|
| Noble Ball Hill | 60 | 204 | 1,470 |

Notes:
[1] 3.4 bats/turbine/year (low = 0.7; high = 47) (NWCC 2004).
[2] 24.5 bats/turbine/survey season (Jain et al. 2007).

## 4.5 Potential Cumulative Impacts on Birds and Bats from Regional Projects

This section evaluates the potential cumulative impacts of the existing or proposed projects in the vicinity of the Project Area.

An approximate range of bird fatalities for the Project was identified in Section 4.4.1 by multiplying the NWCC eastern average and 2006 Maple Ridge daily survey fatality rates for bird kills with the proposed number of turbines (see Table 4-1). Likewise, an approximate number of bat fatalities for the Project was identified in Section 4.4.2 by multiplying the NWCC national average and 2006 Maple Ridge daily survey bat fatality rates with the proposed number of turbines (see Table 4-2). The same calculations are included for the five wind projects cur-

rently proposed in Chautauqua County and the existing Steel Winds project in the City of Lackawanna (Erie County), approximately 25 miles away from the Project Area, in order to demonstrate the potential cumulative impacts on birds and bats in the region (see Tables 4-3 and 4-4). These are only estimates and there can be considerable variation in fatality rates, especially for bats. The number of bird and bat fatalities can only be determined with post-construction mortality studies; however, this estimate allows an evaluation of the potential cumulative impacts. The only post-construction data available from these projects to date are from the Steel Winds post-construction mortality study conducted in 2007 (see Sections 4.4.1 and 4.4.2).

**Table 4-3 Approximate Regional Number of Bird Fatalities**

| Project | Number of Turbines | Approximate Bird Fatalities Per Year Based on NWCC Eastern Average Rate[1] | Approximate Bird Fatalities Per Year Based on 2006 Maple Ridge Daily Survey Rate[2] |
|---|---|---|---|
| **Noble Ball Hill** | **60** | **258** | **576** |
| Horizon New Grange | 47 | 202 | 451 |
| Horizon Pomfret | 49[3] | 211 | 471 |
| Babcock & Brown – Ripley-Westfield Wind Farm | 79 | 340 | 758 |
| Babcock & Brown – State Line Wind | 79[4] | 340 | 758 |
| Steel Winds (existing) | 8 | 35 | 77 |
| **Total** | **313** | **1,386** | **3,091** |

Notes:
1 4.3 birds/turbine/year (NWCC 2004).
2 9.59 birds/turbine/survey season (Jain et al. 2007).
3 Project information is not publicly available, 49 turbines are assumed based on 1.5-MW turbines and the publicly available proposed MW of the Horizon Pomfret project.
4 Number of turbines estimated based on 124.8 MW (same as Ripley-Westfield). This may change based on final turbine selection.

**Table 4-4 Approximate Regional Number of Bat Fatalities**

| Project | Number of Turbines | Approximate Bat Fatalities Per Year Based on NWCC National Average Rate[1] | Approximate Bat Fatalities Per Year Based on 2006 Maple Ridge Daily Survey Rate[2] |
|---|---|---|---|
| **Noble Ball Hill** | **60** | **204** | **1,470** |
| Horizon New Grange | 47 | 160 | 1,152 |
| Horizon Pomfret | 49[3] | 167 | 1,201 |
| Babcock & Brown - Ripley-Westfield Wind Farm | 79 | 269 | 1,936 |
| Babcock & Brown – State Line Wind | 79[4] | 269 | 1,936 |

**Table 4-4 Approximate Regional Number of Bat Fatalities**

| Project | Number of Turbines | Approximate Bat Fatalities Per Year Based on NWCC National Average Rate[1] | Approximate Bat Fatalities Per Year Based on 2006 Maple Ridge Daily Survey Rate[2] |
|---|---|---|---|
| Steel Winds (existing) | 8 | 28 | 196 |
| **Total** | **327** | **1,097** | **7,891** |

Notes:

* Project information is not publicly available, 49 turbines is assumed based on 1.5 MW turbines, and the publicly available proposed MW of the Horizon Pomfret project.

[1] 3.4 bats/turbine/year (low = 0.7; high = 47) (NWCC 2004).

[2] 24.5 bats/turbine/survey season (Jain et al. 2007).

[3] Project information is not publicly available, 49 turbines are assumed based on 1.5-MW turbines and the publicly available proposed MW of the Horizon Pomfret project.

[4] Number of turbines estimated based on 124.8 MW (same as Ripley-Westfield). This may change based on final turbine selection.

The cumulative loss of approximately 1,400 to 3,000 birds per year is not considered to be biologically significant, especially in consideration of other sources of bird mortality. The USFWS estimates that a minimum of 10 billion birds breed in North America (USFWS 2002). There are many widespread sources of bird mortality. However, it is challenging to compare predicted mortality from a proposed wind site to other sources of mortality, because it is only a prediction and local mortality rates from other sources are rarely quantified to allow comparison. On a national scale, the annual bird mortality associated with wind energy facilities (estimated at 33,000 birds per year in 2002) is slight compared to other sources of mortality, such as vehicles (60 million or more deaths per year), building windows (97 to 976 million deaths per year), power and transmission lines (conservatively tens of thousands deaths per year, possibly closer to 174 million deaths per year), communication towers (conservatively 4 to 5 million deaths per year, possibly closer to 40 to 50 million deaths per year), electrocution (estimated tens of thousands per year), pesticides (at least 72 million deaths annually, likely far more), oil spills (hundreds of thousands of deaths per year), oil and wastewater pits (up to two million deaths per year), cats (hundreds of millions of deaths per year), agricultural practices (i.e., hay mowing, pesticides; at least 72 million), and hunting (up to 120 million) (Gill 1995; Erickson et al. 2001; USFWS 2002). These sources of mortality are also present within the Project Area.

The bird kills would be from many different species. Nocturnal migrant passerines will likely make up the majority of bird kills. This is of concern because of the potential of neotropical migrants, many of which are considered in decline, to be among the fatalities. However, these are also among the species that are most harmed by global warming and air pollution (Price and Glick 2004). For example, recent research suggests that acid precipitation from air pollution is contributing to the steady decline of the Wood Thrush in New York (Hames et al. 2002), where numbers are dropping up to 5% per year. Therefore, there are impacts from both non-renewable energy production and from wind energy. Mr. John Flicker, the

president of the National Audubon Society recently (December 14, 2006) commented on this perception issue in support of wind energy (at appropriate sites), saying "When you look at a wind turbine, you can find the bird carcasses and count them. With a coal-fired power plant, you can't count the carcasses, but it's going to kill a lot more birds" (Levesque 2006).

At the present time, it is unknown whether the cumulative annual loss of approximately 1,100 to 7,900 bats is considered to be biologically significant. However, there are ongoing bat mortality studies to determine the overall effects on bat populations. There are increasing concerns about the cumulative impacts of bat fatalities to specific species as the number of wind projects increase and as bats continue to be found during mortality studies at more wind sites, in addition to the White Nose Syndrome situation. As the population sizes and trends of most bats in New York State are unknown, it is uncertain what level of impact is made from wind projects. While bird species populations have been studied and estimated, we are not aware of similar studies for bats and estimates for bat populations are not available and/or highly uncertain. Even with this limited current state of knowledge on bat populations and migration, some researchers have expressed concern that there is the potential for significant cumulative population impacts to bats (Kunz et al 2007; Arnett et al 2008). Only after construction of several wind projects in the northeast and implementation of long-term monitoring protocols would the significance of potential cumulative impacts be assessable.

Post-construction monitoring programs have been established at each of Noble's wind power projects to determine if bird and/or bat collision fatalities occur as a result of project operation, if so, the rate of mortality. Other wind projects will develop similar monitoring programs. These data will be correlated with pre-construction data, including radar data, to determine whether the mortality rates are consistent with the identified impacts. This information can also be used to develop possible means of migration. Information from these studies will also be a valuable resource for wildlife agencies and will provide needed data that can be used to assess the siting of future wind power projects.

# 5 Mitigation

## 5.1 Overview

In May 2007, the NWCC Mitigation Subgroup conducted a literature review of wind siting policies, guidelines, and research about mitigation measures for wind projects and produced a document titled, "Mitigation Toolbox." This work compiles national and international mitigation strategies at local and federal levels, provides an annotated bibliography on wind mitigation, summarizes a number case studies, and provides a matrix illustrating the gaps and overlaps between existing policies/guidelines and current research (NWCC 2007). The purpose of the document is to, "…Catalog existing mitigation measures and to further explore others, and bring them to light for discussion, research, and innovation." The authors acknowledge that the proposed mitigation measures are based on the best available information and understanding of the ecosystems in which the wind projects have been placed and that many of the proposed measures have not yet been adequately studied and validated as to whether they reduce impacts as expected (NWCC 2007). The authors provided a number of mitigation "tools" and cautioned generalizing findings from one geographic region to another because of differences in habitat, topography, and landscape among wind projects.

Mitigation can occur during the design, construction, and operation stages of development. Mitigation can also occur both on and off the site. In the Mitigation Toolbox document, nine general mitigation categories were created: siting, lighting, turbine type, turbine configuration, power lines, habitat enhancement, revegetation, disturbance during construction, and disturbance during operation (NWCC 2007). Each of these categories has a number of strategies that depend on a variety of factors. For example, the optimal height of the rotor to avoid migrating birds and bats may be dependent on the local habitat and topography. Noble has used mitigation measures during the design process and proposes construction and operation mitigation measures, on an as needed basis. Some of the mitigation measures identified for the Project are included in the sections below.

## 5.2 Siting Approach

The primary mitigation measure to avoid or reduce potentially significant bird and bat impacts was Noble's approach to siting. Initially, a study was conducted to identify whether the Project Area held any potential issues related to birds and

bats, among many other categories, that could result in unfavorable impacts. In the siting phase, Noble selected available and appropriate locations for turbines that minimized potential impacts on wetlands, habitat, and land use. As indicated in this document and based on studies conducted for this Project and for projects nearby, Noble has also sited the project in an area that avoids landscape features that attract raptors and migrating birds. These considerations will minimize potential impacts on birds and bats. See Section 1.3 of the DEIS for details on the siting approach and Project alternatives.

## 5.3 Construction Considerations

Clearing for road construction, infrastructure construction, equipment noise, and increased vehicle traffic could affect birds and bats during construction of the Project. Possible mitigation measures during these construction-related activities could include: minimizing the area of impact, reducing erosion, limiting noise and dust, prevention of the invasion of weeds, and minimizing the use of chemicals. During construction, Noble will minimize the area of impact during construction, limit noise and other disturbance, and be cognizant of nesting birds. An environmental monitoring plan is discussed in DEIS Section 2.27 and included in DEIS Appendix U.

## 5.4 Mitigation Measures during Operation

Collisions are often the primary concern with operation-related impacts, but displacement from habitat, and influence on migration, are also potential impacts on birds and bats during operation of the Project. Mitigation measures during operation to reduce these impacts could include: minimal lighting to reduce potential risk of collision at the facility, reseeding of native vegetation, habitat enhancement, and post-construction monitoring.

During nights of inclement weather and/or poor visibility, passerines may fly at lower altitudes and may be attracted to lights, especially steady (i.e., not blinking) lights. While the reasons for this attraction to lights are not certain, it coincides with evidence from tall structures (e.g., communication/television towers and buildings) that events of increased bird collisions occur on nights with poor visibility at structures with steady light. In order to reduce this potential, Noble will avoid using steady burning lights.

In addition, Noble will:

- Provide the minimum allowable lighting and off-cycle as per FAA recommendations;

- Avoid using any flood lights at any structures on site or steady light sources near the turbines;

- Jacket and insulate all overhead collection line conductors; all power carrying hardware for the overhead electrical collection lines will be covered; and

- Install modern turbines (i.e., solid tubular structures) that are designed to prevent birds from perching or nesting on them. No guy wires will be required for these turbines.

Post-construction mortality monitoring will be implemented by Noble to evaluate the actual impacts of the Project on birds and bats. This will help assess the significance of the impacts and, potentially, what the weather or environmental conditions or other circumstances are that contribute to such impacts. Based on real-time, site-specific data collected during the post-construction mortality monitoring, Noble will coordinate closely with NYSDEC to identify and assess potential mitigation strategies that can be implemented to reduce potentially significant adverse impacts, if any. This approach will allow mitigation measures to be developed/modified during the course of Windpark operation that are responsive to site-specific conditions and to the growing and evolving database of information regarding bird/bat interactions with turbines. Noble's work plan for proposed post-construction bird and bat mortality studies is included in Appendix G. The work plan methodology is consistent with previous work plans that Noble has developed through coordination and cooperation with NYSDEC.

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# A Nocturnal Radar and Visual Study, Fall 2006 (Woodlot Alternatives, Inc.)

# Fall 2006 Radar Surveys at the Proposed Ball Hill Windpark in Villenova and Hanover, New York

**Prepared For:**

Noble Environmental Power, LLC

&

Ecology and Environment, Inc.

**Prepared By:**

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January 2008

# Executive Summary

During fall 2006, Woodlot Alternatives, Inc. (Woodlot), now Stantec Consulting (Stantec)[1], conducted field surveys of nocturnal migration activity at proposed Ball Hill Windpark in western New York. The surveys are part of the planning process by Noble Environmental Power, LLC (Noble) the developer of that site. The field investigation included nighttime surveys of birds using radar and represents the first of two seasons of migration surveys to be undertaken by Noble at this site.

The surveys were conducted from September 1 to October 15, 2006. The overall goal of the survey was to document nocturnal migration in the vicinity of the project area, including the number of migrants, their flight direction, and their flight altitude. The results of these field surveys, especially when reviewed along with results of the spring 2007 surveys, provide useful information about site-specific migration activity and patterns in the vicinity of the project.

The fall radar survey targeted 45 nights of radar surveys to collect and record video samples of the radar during horizontal operation, which documents the abundance, flight path, and speed of targets moving through the project area, and vertical operation, which documents the altitude of targets. Periods of sustained inclement weather precluded the collection of radar data on 9 of those nights.

The overall mean passage rate for the entire survey period was 189 ± 21 t/km/hr. The median passage rate was 170 t/km/hr. Nightly passage rates varied from 16 ± 3 targets per kilometer per hour (t/km/hr) to 604 ± 77 t/km/hr. Mean flight direction through the project area was 216º ± 78º.

The mean flight height of targets was 353 meters (m) ± 12 m (1,157’ ± 39’) above the radar site. The average nightly flight height ranged from 228 m ± 19 m (748’ ± 62’) to 482 m ± 43 m (1,580’ ± 141’). The percent of targets observed flying below 120 m (394’) also varied by night, from three percent to thirty-five percent. The seasonal average percentage of targets flying below 120 m was nine percent.

The mean flight direction, qualitative analysis of the surrounding topography and landscape, and mean flight altitude of targets passing over the project area indicates that avian migration in this area involves a broad front type of landscape movement. This type of broad front movement, particularly in conjunction with the high flight heights, demonstrates a limited avian mortality risk during fall migration. Additionally, the flight height of targets indicates that the vast majority of bird migration in the area occurs above the height of the proposed wind turbines.

[1] All field work and any reporting and permitting activities performed prior to October 1, 2007, were conducted as Woodlot Alternatives, Inc. and will be herein referenced as work done by Woodlot. On October 1, 2007, Woodlot Alternatives, Inc. was acquired by Stantec Consulting Services, Inc. Work conducted on or after October 1, 2007, is herein referenced as work done by Stantec.

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# 1.0 Introduction

Noble Environmental Power, LLC (Noble) has proposed the construction of a wind development located in Villenova and Hanover, New York (Figure 1). The project is located on an agricultural plateau surrounded by gently slopping flat-topped ridges, characteristic of the Cattaraugus Highlands. The project area is approximately 8 miles southeast of Lake Erie. The area is largely agricultural and approximately thirty percent forested with oak-dominated hardwoods. The elevation of the area ranges from 457 to 518 meters (m) (1,500' to 1,700').

Woodlot Alternatives, Inc. (Woodlot), now Stantec Consulting (Stantec)[2], conducted a radar survey of nocturnal migration in the project area during the fall 2006 migration period. This is the first of two seasons of radar surveys conducted at this site. The overall goal of the survey was to document nocturnal migration in the vicinity of the project area, including the number of migrants, their flight direction, and their flight altitude.

# 2.0 Methods

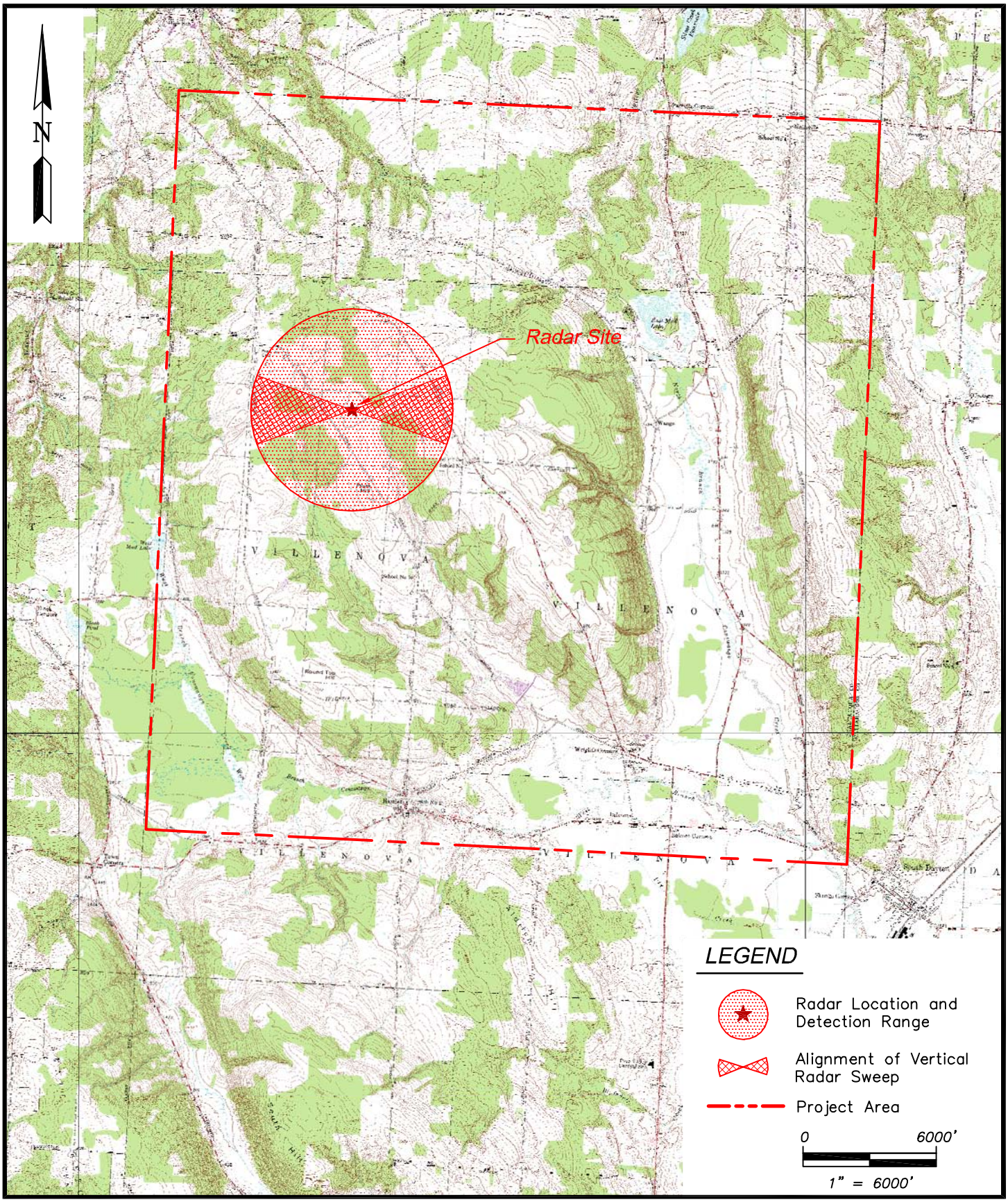
## *2.1 Field Methods*

The radar study was conducted in an over-grown agricultural field, and this site, at an elevation of 512 m (1,679'), provided a moderate view in most directions (Figure 1 and Figure 2). Marine surveillance radar similar to that described by Cooper *et al.* (1991) was used during field data collection. The radar has a peak power output of 12 kW and has the ability to track small animals, including birds, bats, and even insects, based on settings selected for the radar functions. It cannot, however, readily distinguish between different types of animals being detected. Consequently, all animals observed on the radar screen were identified as "targets." The radar has an "echo trail" function which captures past echoes of the flight paths of targets, enabling determination of flight direction. During all operations, the radar's echo trail was set to 30 seconds.

The radar was equipped with a 2 m (6.5') waveguide antenna. The antenna has a vertical beam height of 20º (10º above and below horizontal) and the front end of the antenna was inclined approximately 5º to increase the proportion of the beam directed into the sky.

Objects on the ground detected by the radar cause returns on the radar screen (echoes) that appear as blotches called ground clutter. Large amounts of ground clutter reduce the ability of the radar to track birds and bats flying over those areas. However, vegetation and hilltops near the radar can be used to reduce or eliminate ground clutter by 'hiding' clutter-causing objects from the radar. These nearby features also cause ground clutter but their proximity to the radar antenna generally limits the ground clutter to the center of the radar screen (Figure 3). The presence of ground clutter and other objects that could reduce clutter are important factors to be considered during the site selection process. At the Ball Hill Windpark, the radar site selection was constrained by limited landowner access during the fall 2006 season and views to the southwest were somewhat obstructed by a forest edge.

[2] All field work and any reporting and permitting activities performed prior to October 1, 2007, were conducted as Woodlot Alternatives, Inc. and will be herein referenced as work done by Woodlot. On October 1, 2007, Woodlot Alternatives, Inc. was acquired by Stantec Consulting Services, Inc. Work conducted on or after October 1, 2007, is herein referenced as work done by Stantec.




PREPARED BY:
Stantec
WOODLOT
106193-F001-radarF06.dwg

SHEET TITLE:
Radar Location Map

PROJECT:
Proposed Noble Ball Hill Windpark
Villenova and Hanover, New York

DATE: December 2006
SCALE: 1"=6000'
PROJ. NO.: 106193
FIGURE:
1



**Figure 2.** Radar setup in the Ball Hill project area during fall 2006 radar survey

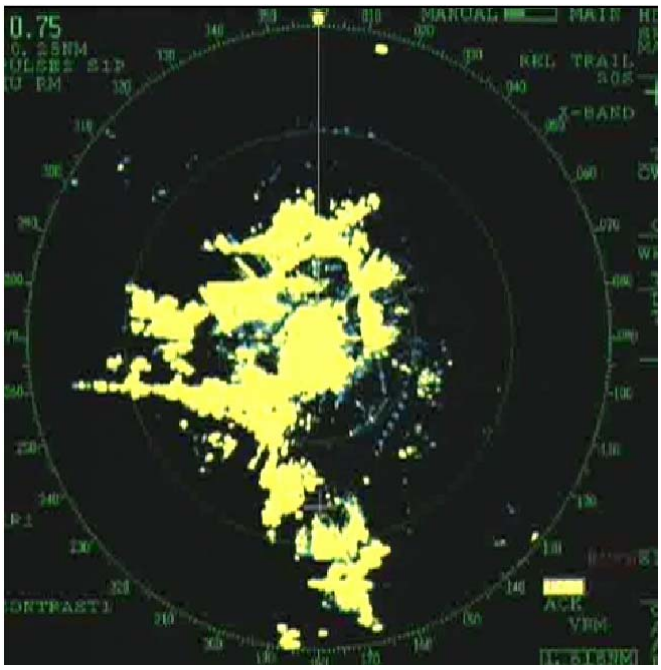



**Figure 3.** Ground clutter in the Ball Hill project area during fall 2006 radar survey

Radar surveys were conducted from sunset to sunrise. Forty-five nights of surveys were targeted for sampling between September 1 and October 15, 2006. Because the anti-rain function of the radar must be turned down to detect small songbirds and bats, surveys could not

be conducted during periods of inclement weather. Therefore, surveys were targeted largely for nights without rain. However, in order to characterize migration patterns during nights without optimal conditions, some nights with weather events including occasional showers were sampled.

The radar was operated in two modes throughout the night. In the first mode, surveillance, the antenna spins horizontally to survey the airspace around the radar and detects targets moving through the area. By analyzing echo trails, the flight direction of targets can be determined. In the second mode of operation, vertical, the antenna is rotated 90º to vertically survey the airspace above the radar (Harmata *et al.* 1999). In vertical mode, target echoes do not provide directional data but do provide information on the altitude of targets passing through the vertical, 20º radar beam. Both modes of operation were used during each hour of sampling.

The radar was operated at a range of 1.4 km (0.75 nautical miles). At this range, the echoes of small birds can be easily detected, observed, and tracked. At greater ranges, larger birds can be detected but the echoes of small birds are reduced in size and restricted to a smaller portion of the radar screen, reducing the ability to observe the movement pattern of individual targets.

## *2.2 Data Collection*

The radar display was connected to video recording software of a computer. Based on a random sequence for each night, approximately 25 minutes of video samples were recorded during each hour of operation. These included 15 one-minute horizontal samples and 10 one-minute vertical samples.

During each hour, additional information was also recorded, including weather conditions and ceilometer observations. Ceilometer observations involved directing a one-million candlepower spotlight vertically into the sky in a manner similar to that described by Gauthreaux (1969). The ceilometer beam was observed by eye for 5 minutes to document and characterize low-flying (below 120 m [394']) targets. The ceilometer was held in-hand so that any birds, bats, or insects passing through it could be tracked for several seconds, if needed. Observations from each ceilometer observation period were recorded, including the number of birds, bats, and insects observed. This information was used during data analysis to help characterize activity of birds, bats, and insects. On cloud-free nights, when the moon was full and light was too diffuse to observe targets moving through the ceilometer beam, the moon-watch technique was used. Similar to the ceilometer, the moon-watch involves a 5-minute observation period during which time the observer trains a pair of binoculars at the full, or near full moon and counts the numbers of migrants observed.

## *2.3 Data Analysis*

Video samples were analyzed using a digital analysis software tool developed by Woodlot. For horizontal samples, targets were identified as birds and bats rather than insects based on their speed. The speed of targets was corrected for wind speed and direction; targets traveling faster than approximately 6 m (20') per second were identified as a bird or bat target (Larkin 1991, Bruderer and Boldt 2001). The software tool recorded the time, location, and flight vector for each target traveling fast enough to be a bird or bat. The results for each sample were output to a spreadsheet. For vertical samples, the software tool recorded the entry point of targets passing through the vertical radar beam, the time, and flight altitude above the radar location. The results for each sample were output to a spreadsheet. These datasets were then used to

calculate passage rate (reported as targets per kilometer of migratory front per hour), flight direction, and flight altitude of targets.

Mean target flight directions (± 1 circular standard deviation) were summarized using software designed specifically to analyze directional data (Oriana2© Kovach Computing Services). The statistics used for this analysis are based on Batschelet (1965), which take into account the circular nature of the data. Nightly wind direction was also summarized using similar methods and data collected from the nearest meteorological measurement tower (met tower) to the radar.

Flight altitude data were summarized using linear statistics. Mean flight altitudes (± 1 standard error) were calculated by hour, night, and overall season. The percent of targets flying below 120 m (394'), the approximate maximum height of the proposed wind turbines, was also calculated hourly, for each night, and for the entire survey period.

# 3.0 Results

Radar surveys were targeted for a 45 night period from September 1 to October 15, 2006. Inclement weather on nine of those nights precluded conducting surveys (Appendix A Table 1). Consequently, a total of 36 nights of radar data were collected. The radar site provided moderate visibility of the surrounding airspace, and targets were observed in most areas of the radar display unit.

## *3.1 Passage Rates*

Nightly passage rates varied from 16 ± 3 targets per kilometer per hour (t/km/hr) (September 30) to 604 ± 77 t/km/hr (September 16), and the overall mean passage rate for the entire survey period was 189 ± 21 t/km/hr (Figure 4; Appendix A Table 2), with a median passage rate of 170 t/km/hr. On nights with highest observed passage rates, the wind was typically calm to moderate.

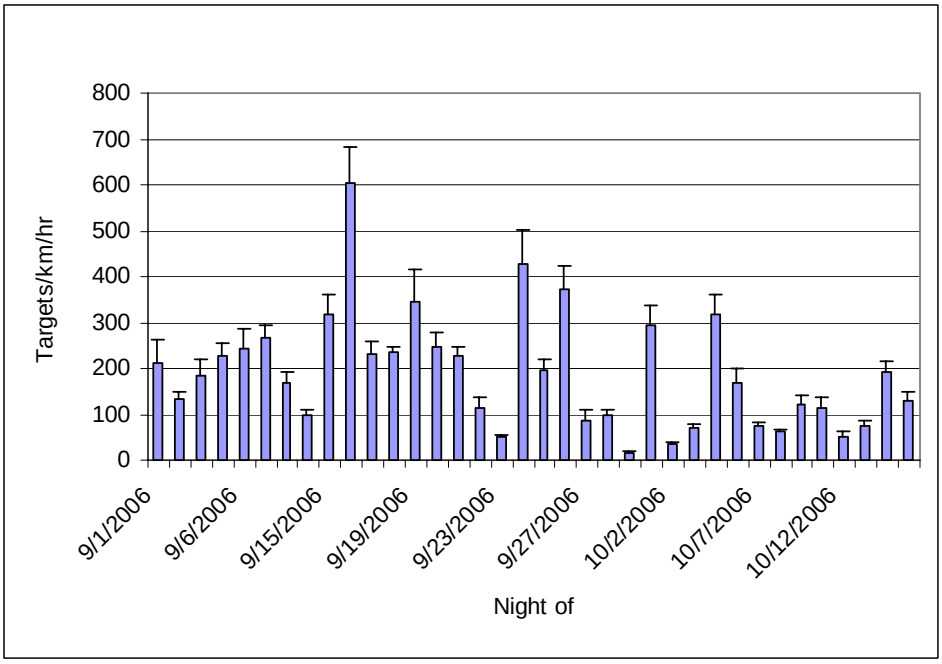



**Figure 4.** Nightly mean passage rates (error bars = 1 SE) observed – fall 2006

Individual hourly passage rates varied throughout the entire season from 0 to 996 t/km/hr (Appendix A Table 2). Hourly passage rates varied throughout each night and for the season overall. For the entire season, passage rates were highest from the third to fifth hour after sunset (Figure 5).

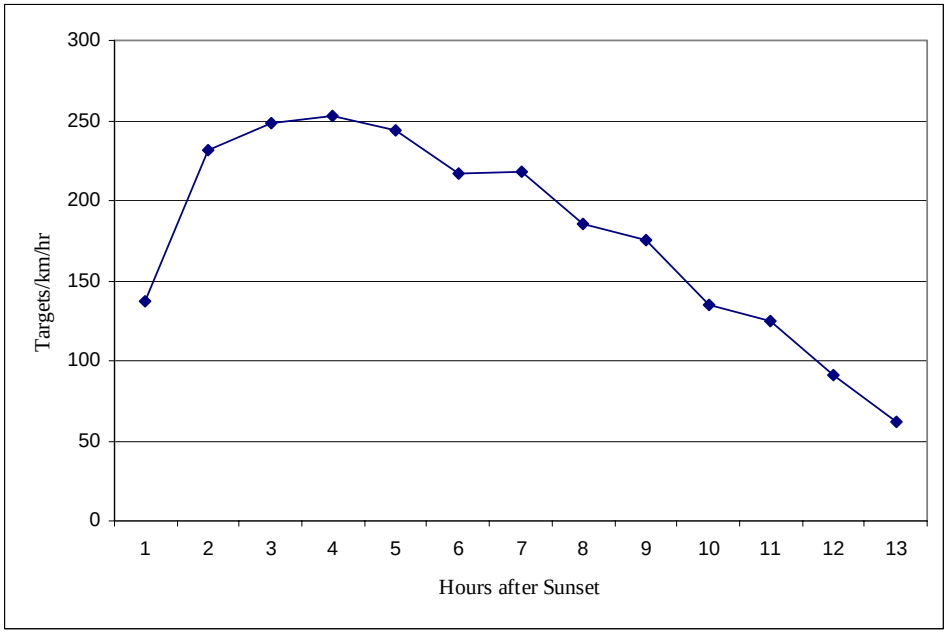



**Figure 5.** Hourly mean passage rates for entire season – fall 2006

## 3.2 Flight Direction

Mean flight direction through the project area was 216º ± 78º (Figure 6). There was considerable night-to-night variation in mean flight direction, although most nights included flight directions generally to the south and southwest (Appendix A Table 3).

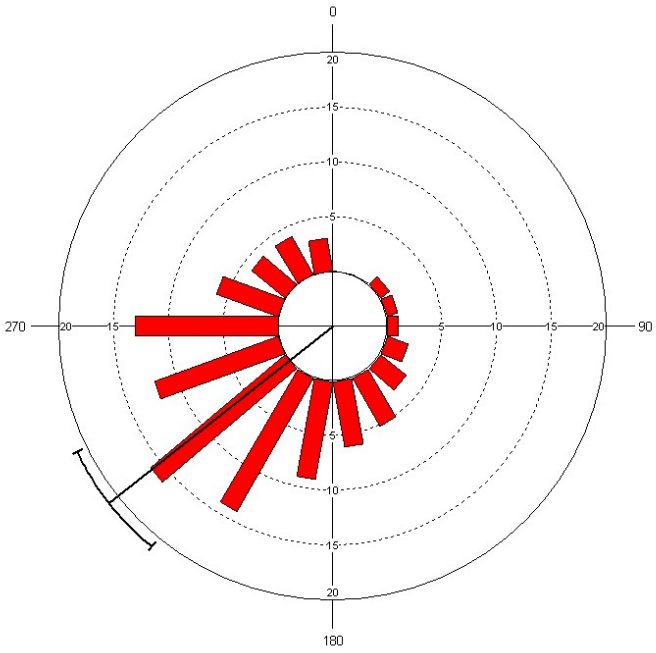



**Figure 6.** Mean flight direction for the entire season (the bracket along the margin of the histogram is the 95% confidence interval for the seasonal mean flight direction) – fall 2006

## 3.3 Flight Altitude

The mean flight height of all targets was 353 m ± 12 m (1,157' ± 39') above the radar site and the median flight height was 339 m (1,112'). The average nightly flight height ranged from 228 m ± 19 m (748' ± 62') on October 12 to 510 m ± 50 m (1,674' ± 163') on September 29 (Figure 7; Appendix A Table 4). The percent of targets observed flying below 120 m (394') also varied by night, from three percent to thirty-five percent (Figure 8). The seasonal average of targets flying below 120 m (394') was nine percent. Hourly flight height remained relatively consistent between 350 m and 400 m throughout the night, except for the first hour after sunset and the four hours before sunrise, when flight decreased between 250 m and 350 m (Figure 9).

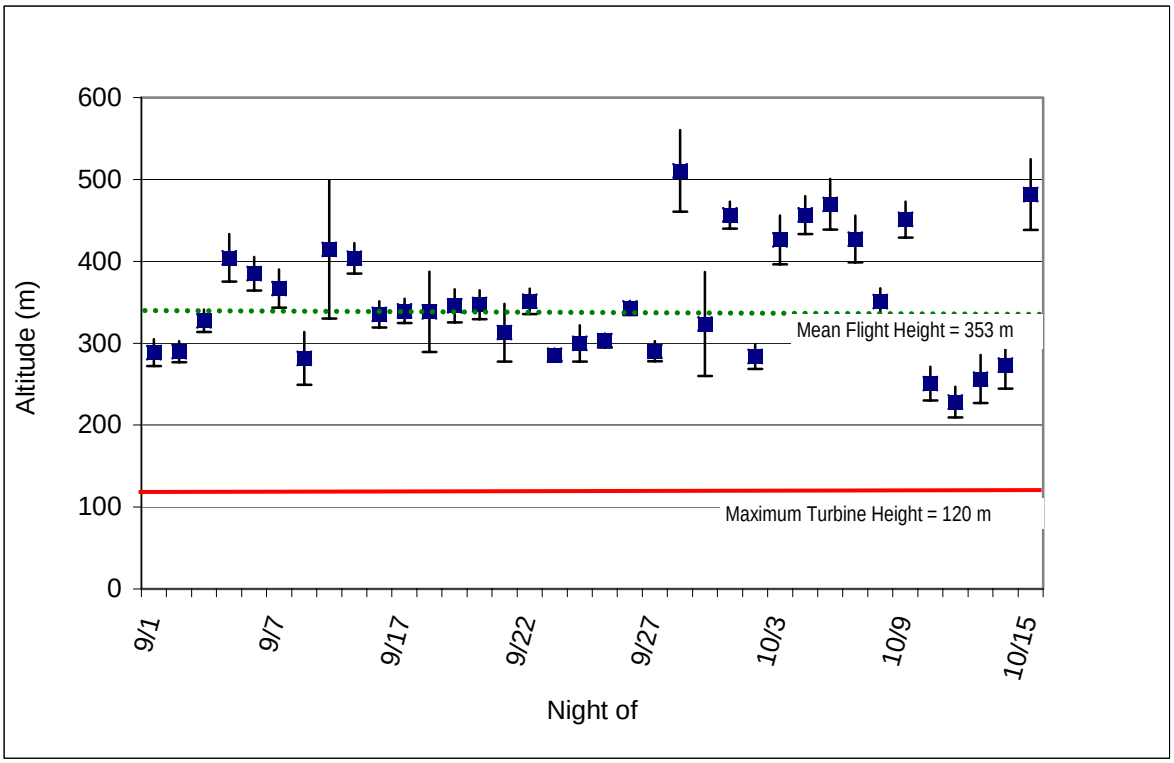



**Figure 7.** Mean nightly flight height of targets – fall 2006

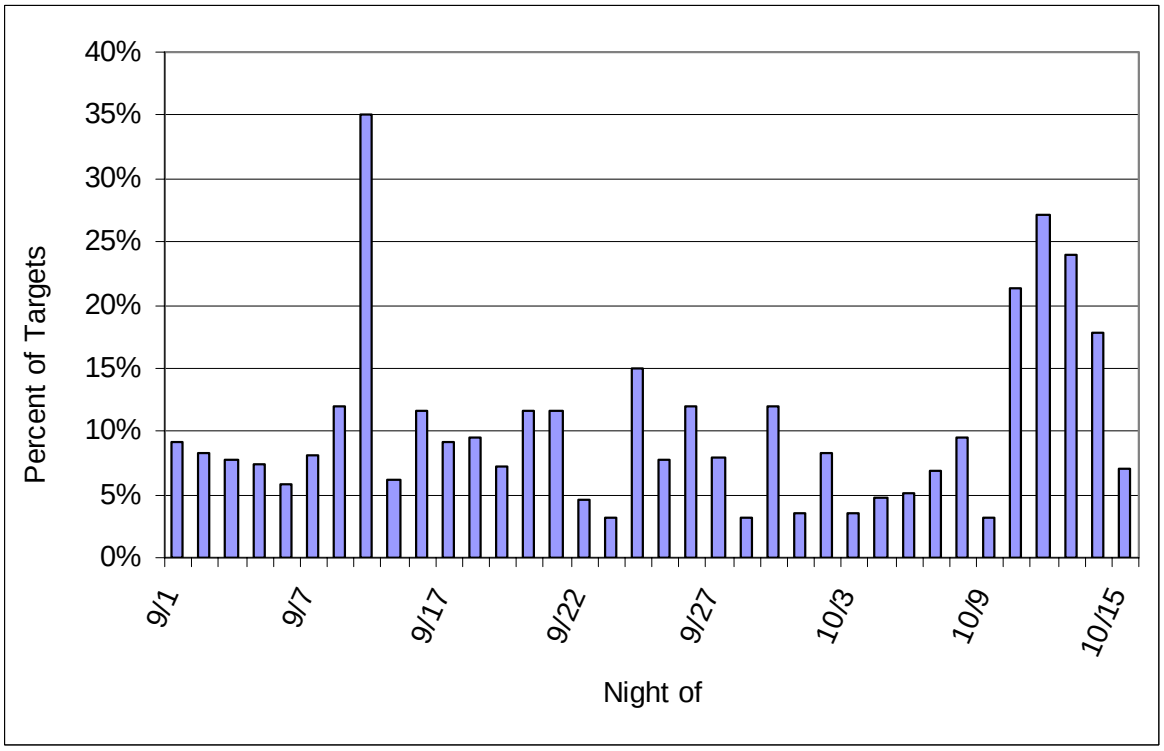



**Figure 8.** Percent of targets observed flying below a height of 120 m (394') – fall 2006

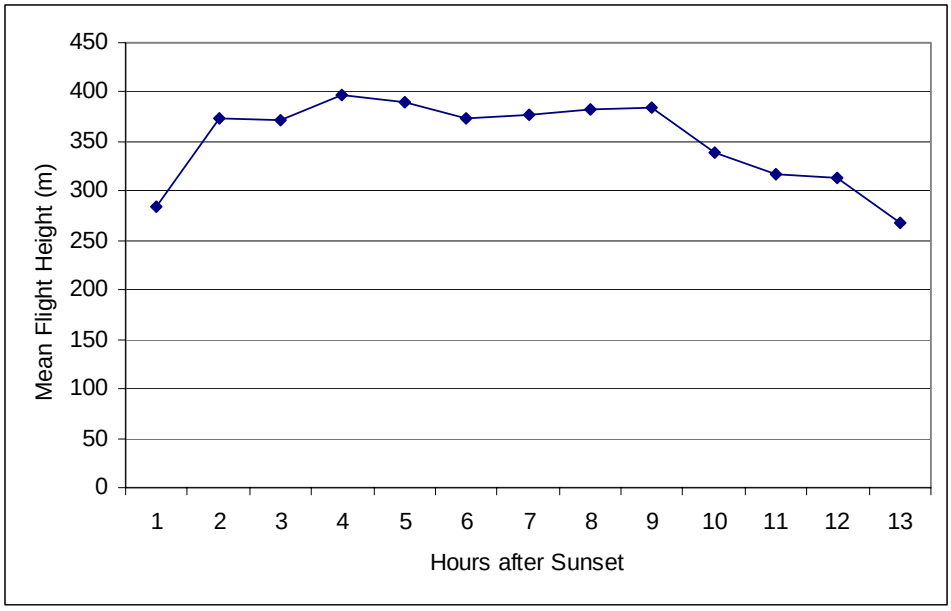



**Figure 9.** Hourly mean target flight height distribution – fall 2006

## *3.4 Ceilometer and Moonwatching Observations*

Ceilometer and moonwatching data collected during the radar survey yielded a total of 313 five-minute observations. Those observations resulted in only 31 bird and 12 bat sightings in the ceilometer beam or face of the moon, and also resulted in nearly 700 insect observations. In comparison, three percent of targets documented during radar surveys were identified as possible bats. Two percent of all targets were identified as insects and were not included in calculations of passage rates.

# 4.0 Discussion

Fall 2006 radar surveys documented migration activity and patterns in the vicinity of the proposed Ball Hill Windpark area. In general, migration activity and flight patterns varied among and within nights, which is very typical of nighttime migration. Nightly variation in the number of and flight characteristics of nocturnally-migrating songbirds is not uncommon and is often attributed to weather patterns, such as cold fronts and winds aloft (Hassler *et al.* 1963, Gauthreaux and Able 1970, Richardson 1972, Able 1973, Bingman *et al.* 1982, and Gauthreaux 1991).

Radar surveys using similar methods and equipment conducted within the last several years are rapidly becoming available. These other studies provide an opportunity to reference the results from the Ball Hill Windpark to other areas of New York, the Northeast, and the central Appalachian states. However, there are limitations in comparing data from previous years with data from 2006, as year-to-year variation in continental bird populations and weather patterns may effect how many birds migrate through an area or region. Additionally, differences in site characteristics at each radar survey location, particularly the landscape and vegetation surrounding a radar site, can play a significant role in any radar's ability to detect targets in all directions around it and the subsequent calculation of passage rate. This last factor must be

recognized as one of, if not the most significant limiting factor in making direct site-to-site comparisons in passage rates from radar data. As mentioned previously, the radar site at Ball Hill provided moderate views of the surrounding landscape and some limitations in the radar's visibility occurred. Conversely, the consideration of potential landscape and vegetation effects on radar visibility is not as important for the calculation of flight height, as the main portion of the radar beam is directed skyward, rather than in a 360° horizontal plane around the radar.

Regardless of any potential differences between site conditions at radar survey locations, the nightly mean passage rates observed at the proposed Ball Hill Windpark (seasonal mean of 189 t/km/hr) was low but within the range of other available studies (Appendix A, Table 6). Currently in the wind power industry, there is no direct correlation between passage rates and risk of collisions with wind turbines, and it is not known precisely how passage rate calculated with this method translates to overall fatalities. While conventional wisdom might be to assume that increased passage rate may translate to measurable increases in fatalities, overall documented bird mortality at wind facilities has been low, so there may instead be a critical threshold at which the likelihood of collisions increases more significantly. In either case, the low level of nighttime activity documented at Ball Hill might be indicative of an overall low potential impact to night migrants from the project.

Some research suggests that bird migration may be affected by landscape features, such as coastlines, large river valleys, and mountain ranges. This preference has been documented for diurnally-migrating birds, such as raptors, but is not as well established for nocturnally migrating birds (Sielman *et al*. 1981; Bingman *et al*. 1982; Bruderer and Jenni 1990; Richardson 1998; Fortin *et al*. 1999; Williams *et al.* 2001; Diehl *et al*. 2003; Woodlot, unpublished data). Research evidence suggests that night-migrating birds are typically affected by areas of varied topography, such as the most rugged areas of the northern Appalachians and the Alps. The landscape around the Ball Hill Windpark consists of rolling farmfields with elevation differentials of less than 60 m (197'). This differential is considerably less than in those areas where potential topographic effects on flight direction have been observed. The mean flight direction of 216 ± 78º suggests migrants use a broad front migratory path across the project area.

The proximity of the project to Lake Erie and its location relative to the lake may have affected the passage rates documented at Ball Hill. There is some evidence suggesting that migrants are affected by coastlines, including coastlines of large lakes. The project area is located southeast of Lake Erie, which may result in a 'rain shadow' effect during fall migration. Specifically, birds approaching the northeastern shore of the lake may divert their movement southeastward to avoid crossing the lake. This would divert some migrants away from the Ball Hill vicinity. If this phenomenon is occurring, the opposite might be expected during the spring migration period and night migrants may be more concentrated near the southeast shore of the lake.

The emerging body of studies characterizing nighttime bird movements shows a relatively consistent trend in regards to the altitude at which night migrants fly (Appendix A, Table 6). In general, nighttime migration typically occurs several hundred meters or more above the ground. The range in mean flight heights for all surveys is approximately 300 m (1,000') to 600 m (2,000') above the radar location (Appendix A, Table 6). The percentage of targets documented at heights below that of typical modern wind turbines is variable, but is usually ten to twenty percent (Appendix A, Table 6). At Ball Hill, a higher percentage of targets were observed below 120 m on a few nights late in the season in mid October which were marked by cold temperatures, overcast skies, and occasional snow showers with high SW winds, as well as one night in mid September which included high south winds and occasional periods of heavy

precipitation. Overall, the mean flight height and documented at Ball Hill Windpark (353 m; 1,157') is well within the range of other studies in the region.

The mean flight altitude of targets documented during this study further supports the presumption that topographic features are not affecting migration patterns, particularly flight direction. The mean flight altitude being high above the radar, which was located near the top of a plateau, indicates that most birds are flying so high that their flight is unimpeded by topographic features, such as the hilltops of the project area.

# 5.0 Conclusions

Radar surveys during the fall 2006 migration period have provided important information on nocturnal bird migration patterns in the vicinity of the Ball Hill Windpark. The results of the surveys indicate that bird migration patterns are generally similar to patterns observed at other sites in the region.

Migration activity varied throughout the season, which is probably largely attributable to weather patterns. The mean passage rate is within, but at the low end of, the range of passage rates observed at similar radar studies. The combination of flight height and flight direction data indicates that the majority of the migrants are flying at altitudes well above the project area and are unimpeded by topography. The flight height data also suggest that the majority of migration during the fall survey period took place well above the height of the proposed turbines. The percent of targets flying below turbine height was within the range observed at other radar sites.

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# Appendix A

## Radar Survey Data Tables

**Appendix A Table 1.** Survey dates, results, level of effort, and weather - Proposed Ball Hill Windpark -Fall 2006

| Date | Mean Passage Rate | Mean Flight Direction | Mean Flight Height (m) | % below 120 m | Hours of Survey | Mean Temperature (F) | Mean Wind Speed (mph) | Mean Wind Direction (from) |
|---|---|---|---|---|---|---|---|---|
| 9/1/2006 | 212 | 226.466° | 288 | 9% | 5 | 61 | 6 | Calm |
| 9/3/2006 | 132 | 155.606° | 290 | 8% | 11 | 61 | 8 | WNW |
| 9/4/2006 | 186 | 246.802° | 327 | 8% | 10 | 62 | 5 | Calm |
| 9/5/2006 | 227 | 166.899° | 404 | 7% | 11 | 63 | 5 | SSW |
| 9/6/2006 | 245 | 206.296° | 385 | 6% | 11 | 62 | 7 | SSW |
| 9/7/2006 | 266 | 259.02° | 367 | 8% | 5 | 65 | 8 | SSW |
| 9/8/2006 | 169 | 314.088° | 282 | 12% | 4 | 68 | 10 | SSW |
| 9/13/2006 | 98 | 7.286° | 415 | 35% | 10 | 65 | 9 | S |
| 9/15/2006 | 316 | 191.402° | 404 | 6% | 12 | 60 | 5 | Calm |
| 9/16/2006 | 604 | 227.988° | 335 | 12% | 12 | 59 | 6 | Calm |
| 9/17/2006 | 231 | 312.637° | 339 | 9% | 12 | 68 | 13 | SSW |
| 9/18/2006 | 237 | 181.273° | 338 | 9% | 4 | 66 | 7 | W |
| 9/19/2006 | 346 | 155.363° | 346 | 7% | 6 | 56 | 8 | SW |
| 9/20/2006 | 248 | 197.124° | 347 | 12% | 11 | 54 | 8 | W |
| 9/21/2006 | 228 | 242.354° | 313 | 12% | 11 | 49 | 7 | S |
| 9/22/2006 | 115 | 331.829° | 351 | 5% | 11 | 64 | 13 | SW |
| 9/23/2006 | 50 | 1.914° | 285 | 3% | 11 | 69 | 14 | SW |
| 9/24/2006 | 427 | 216.749° | 300 | 15% | 11 | 59 | 11 | WNW |
| 9/25/2006 | 195 | 194.383° | 303 | 8% | 11 | 60 | 10 | NW |
| 9/26/2006 | 372 | 265.335° | 343 | 12% | 12 | 54 | 15 | S |
| 9/27/2006 | 87 | 311.276° | 290 | 8% | 10 | 60 | 10 | SW |
| 9/29/2006 | 97 | 233.959° | 510 | 3% | 12 | 49 | 11 | S |
| 9/30/2006 | 16 | 339.998° | 323 | 12% | 6 | 54 | 10 | SW |
| 10/1/2006 | 292 | 189.781° | 457 | 4% | 12 | 51 | 4 | South |
| 10/2/2006 | 36 | 6.663° | 284 | 8% | 7 | 64 | 13 | SSW |
| 10/3/2006 | 69 | 270.108° | 426 | 4% | 12 | 59 | 7 | SSW |
| 10/5/2006 | 317 | 215.139° | 457 | 5% | 13 | 43 | 5 | ENE |
| 10/6/2006 | 169 | 231.665° | 470 | 5% | 12 | 44 | 6 | NE |
| 10/7/2006 | 76 | 224.676° | 427 | 7% | 12 | 45 | Calm | Calm |
| 10/8/2006 | 61 | 96.012° | 351 | 9% | 12 | 55 | 5 | SSW |
| 10/9/2006 | 121 | 173.803° | 451 | 3% | 13 | 54 | 4 | Calm |
| 10/10/2006 | 113 | 250.85° | 251 | 21% | 10 | 61 | 10 | SE |
| 10/12/2006 | 53 | 73.428° | 228 | 27% | 13 | 38 | 15 | SW |
| 10/13/2006 | 76 | 70.244° | 256 | 24% | 13 | 48 | 8 | SW |
| 10/14/2006 | 194 | 161.843° | 273 | 18% | 11 | 46 | Calm | Calm |
| 10/15/2006 | 129 | 214.07° | 482 | 7% | 13 | 42 | Calm | Calm |

**Appendix A Table 2.** Summary of passage rates by hour, night, and for entire season.

| Night of | Passage Rate (targets/km/hr) by hour after sunset | | | | | | | | | | | | | Entire Night | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Mean | Median | Stdev | SE |
| 9/1/2006 | -- | -- | -- | 418 | 162 | 181 | 162 | 138 | -- | -- | -- | -- | -- | 212 | 172 | 116 | 52 |
| 9/3/2006 | 43 | 86 | 96 | 147 | 236 | 180 | 154 | 118 | 171 | 86 | 139 | -- | -- | 132 | 136 | 54 | 16 |
| 9/4/2006 | 207 | 332 | 311 | 329 | 164 | 171 | 90 | 82 | 90 | -- | 86 | -- | -- | 186 | 171 | 104 | 33 |
| 9/5/2006 | 180 | 436 | 343 | 257 | 176 | 188 | 163 | 220 | 193 | 171 | 171 | -- | -- | 227 | 190 | 87 | 26 |
| 9/6/2006 | 180 | 471 | 252 | 264 | 393 | 343 | 291 | 279 | 71 | 64 | 86 | -- | -- | 245 | 258 | 134 | 40 |
| 9/7/2006 | 164 | 283 | 327 | 297 | 257 | -- | -- | -- | -- | -- | -- | -- | -- | 266 | 275 | 62 | 28 |
| 9/8/2006 | 117 | 173 | 236 | 150 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 169 | 169 | 50 | 25 |
| 9/13/2006 | 141 | 107 | 86 | 68 | 100 | 139 | 56 | 54 | 86 | 139 | -- | -- | -- | 98 | 98 | 34 | 11 |
| 9/15/2006 | 129 | 209 | 284 | 264 | 300 | 316 | 309 | 514 | 386 | 486 | 557 | 43 | -- | 316 | 309 | 153 | 44 |
| 9/16/2006 | 455 | 810 | 996 | 786 | 868 | 761 | 664 | 654 | 486 | 300 | 396 | 71 | -- | 604 | 654 | 267 | 77 |
| 9/17/2006 | 166 | 375 | 343 | 332 | 246 | 246 | 257 | 86 | 153 | 193 | 279 | 100 | -- | 231 | 246 | 94 | 27 |
| 9/18/2006 | 236 | 207 | 252 | 251 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 237 | 237 | 21 | 11 |
| 9/19/2006 | 327 | 525 | 458 | 418 | 303 | 43 | -- | -- | -- | -- | -- | -- | -- | 346 | 346 | 170 | 69 |
| 9/20/2006 | 64 | 264 | 329 | 305 | 257 | 327 | 364 | 321 | 279 | 150 | 64 | -- | -- | 248 | 271 | 106 | 32 |
| 9/21/2006 | 171 | 283 | 300 | 271 | 279 | 273 | 221 | 225 | 214 | 186 | 86 | -- | -- | 228 | 227 | 63 | 19 |
| 9/22/2006 | 193 | 100 | 209 | -- | 43 | 133 | 48 | 9 | 86 | 79 | 111 | 257 | -- | 115 | 106 | 77 | 23 |
| 9/23/2006 | 50 | 107 | 69 | 46 | 54 | 36 | 43 | 48 | 43 | 21 | 29 | -- | -- | 50 | 47 | 23 | 7 |
| 9/24/2006 | 107 | 171 | 240 | 357 | 493 | 713 | 643 | 664 | 651 | 589 | -- | 64 | -- | 427 | 460 | 246 | 74 |
| 9/25/2006 | 93 | 179 | 193 | 257 | -- | 284 | 257 | 268 | 257 | 179 | 146 | 36 | -- | 195 | 194 | 80 | 24 |
| 9/26/2006 | 193 | 407 | 493 | 571 | 573 | 557 | 584 | 370 | 236 | 171 | 157 | 150 | -- | 372 | 372 | 181 | 52 |
| 9/27/2006 | 171 | 146 | 163 | 175 | 32 | 0 | 129 | 4 | 48 | 0 | -- | -- | -- | 87 | 87 | 76 | 24 |
| 9/29/2006 | 57 | 54 | 139 | 129 | 150 | 150 | 145 | 120 | 86 | 51 | 21 | 60 | -- | 97 | 97 | 47 | 13 |
| 9/30/2006 | -- | -- | 21 | 19 | -- | 21 | 12 | 16 | -- | 5 | -- | -- | -- | 16 | 16 | 6 | 3 |
| 10/1/2006 | 89 | 236 | 273 | 461 | 457 | 498 | 450 | 321 | 268 | 246 | -- | 64 | 145 | 292 | 273 | 149 | 43 |
| 10/2/2006 | -- | -- | -- | -- | -- | 39 | 27 | 47 | 56 | 21 | 39 | 27 | | 36 | 38 | 12 | 5 |
| 10/3/2006 | 54 | 43 | 21 | 57 | 90 | 86 | -- | 107 | 86 | 86 | 50 | 129 | 21 | 69 | 69 | 33 | 10 |
| 10/5/2006 | 159 | 546 | 463 | 479 | 407 | 482 | 396 | 393 | 214 | 193 | 186 | 179 | 21 | 317 | 355 | 164 | 45 |
| 10/6/2006 | 150 | 214 | 373 | 369 | 198 | 64 | 161 | 99 | 171 | 75 | 38 | 114 | | 169 | 161 | 109 | 31 |
| 10/7/2006 | 120 | 114 | -- | 64 | 93 | 82 | 75 | 75 | 80 | 21 | 43 | 86 | 59 | 76 | 76 | 28 | 8 |
| 10/8/2006 | 64 | 50 | 107 | 100 | -- | 70 | 52 | 54 | 48 | 54 | 43 | 75 | 21 | 61 | 54 | 24 | 7 |
| 10/9/2006 | 75 | 107 | 64 | 107 | 139 | 220 | 279 | 171 | 43 | 75 | 171 | 113 | 11 | 121 | 110 | 74 | 21 |
| 10/10/2006 | 71 | 201 | 257 | 204 | 118 | 43 | -- | 0 | -- | 96 | 68 | 73 | -- | 113 | 96 | 82 | 26 |
| 10/12/2006 | 14 | 21 | 21 | 43 | 60 | 54 | 21 | 96 | 86 | 32 | 32 | 54 | 150 | 53 | 48 | 39 | 11 |
| 10/13/2006 | 79 | 51 | 43 | 107 | 93 | 43 | 137 | 64 | 171 | 75 | 57 | 64 | 0 | 76 | 70 | 44 | 12 |
| 10/14/2006 | 93 | 180 | 207 | 227 | 343 | 268 | -- | 200 | 253 | 155 | 129 | 79 | -- | 194 | 197 | 79 | 24 |
| 10/15/2006 | 93 | 157 | 229 | 268 | 227 | 129 | 136 | 107 | 59 | 32 | 48 | 64 | 129 | 129 | 129 | 74 | 21 |
| **Entire Season** | **137** | **232** | **248** | **253** | **244** | **216** | **218** | **185** | **175** | **134** | **124** | **91** | **62** | **189** | **170** | **125** | **21** |

-- indicates no data for that hour

**Appendix A Table 3.** Mean Nightly Flight Direction at Ball Hill Windpark in Fall 2006.

| Night of | Mean Flight Direction | Circular Stdev |
|---|---|---|
| 9/1/2006 | 226.466° | 52.687° |
| 9/3/2006 | 155.606° | 69.942° |
| 9/4/2006 | 246.802° | 65.265° |
| 9/5/2006 | 166.899° | 84.026° |
| 9/6/2006 | 206.296° | 91.914° |
| 9/7/2006 | 259.02° | 78.419° |
| 9/8/2006 | 314.088° | 112.175° |
| 9/13/2006 | 7.286° | 80.014° |
| 9/15/2006 | 191.402° | 70.476° |
| 9/16/2006 | 227.988° | 55.517° |
| 9/17/2006 | 312.637° | 103.299° |
| 9/18/2006 | 181.273° | 82.792° |
| 9/19/2006 | 155.363° | 59.172° |
| 9/20/2006 | 197.124° | 67.674° |
| 9/21/2006 | 242.354° | 55.964° |
| 9/22/2006 | 331.829° | 83.33° |
| 9/23/2006 | 1.914° | 73.982° |
| 9/24/2006 | 216.749° | 38.02° |
| 9/25/2006 | 194.383° | 64.767° |
| 9/26/2006 | 265.335° | 55.925° |
| 9/27/2006 | 311.276° | 62.115° |
| 9/29/2006 | 233.959° | 60.177° |
| 9/30/2006 | 339.998° | 66.824° |
| 10/1/2006 | 189.781° | 47.851° |
| 10/2/2006 | 6.663° | 84.236° |
| 10/3/2006 | 270.108° | 58.886° |
| 10/5/2006 | 215.139° | 28.886° |
| 10/6/2006 | 231.665° | 41.627° |
| 10/7/2006 | 224.676° | 105.38° |
| 10/8/2006 | 96.012° | 93.864° |
| 10/9/2006 | 173.803° | 62.064° |
| 10/10/2006 | 250.85° | 63.83° |
| 10/12/2006 | 73.428° | 73.547° |
| 10/13/2006 | 70.244° | 87.242° |
| 10/14/2006 | 161.843° | 45.24° |
| 10/15/2006 | 214.07° | 78.621° |
| **Entire Season** | **216°** | **78°** |

**Appendix A Table 4.** Summary of flight heights by hour, night, and for entire season.

| Night of | Mean Flight Height (m) by hour after sunset | | | | | | | | | | | | | Entire Night | | | | % of targets below 120 meters |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Mean | Median | STDV | SE | |
| 9/1/2006 | -- | -- | -- | 345 | 302 | 266 | 251 | 278 | -- | -- | -- | -- | -- | 288 | 283 | 37 | 16 | 9% |
| 9/3/2006 | 240 | 337 | 305 | 308 | 244 | 281 | 300 | 260 | 374 | 302 | 235 | -- | -- | 290 | 295 | 43 | 13 | 8% |
| 9/4/2006 | 216 | 350 | -- | 338 | 355 | 354 | 307 | 360 | 345 | 313 | 336 | -- | -- | 327 | 338 | 43 | 14 | 8% |
| 9/5/2006 | 334 | 422 | 494 | 532 | 516 | 403 | 406 | 469 | 350 | 289 | 233 | -- | -- | 404 | 405 | 96 | 29 | 7% |
| 9/6/2006 | 297 | 407 | 417 | 419 | 386 | 371 | 383 | 366 | 456 | 487 | 245 | -- | -- | 385 | 386 | 68 | 20 | 6% |
| 9/7/2006 | 277 | 402 | 368 | 380 | 405 | -- | -- | -- | -- | -- | -- | -- | -- | 367 | 374 | 52 | 23 | 8% |
| 9/8/2006 | 219 | 298 | 327 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 282 | 290 | 56 | 32 | 12% |
| 9/13/2006 | 3 | 104 | -- | 476 | 660 | 478 | 439 | 652 | 504 | 419 | -- | -- | -- | 415 | 457 | 239 | 84 | 35% |
| 9/15/2006 | 224 | 439 | 418 | 410 | 427 | 438 | 457 | 467 | 409 | 403 | 346 | 407 | -- | 404 | 410 | 65 | 19 | 6% |
| 9/16/2006 | 310 | 395 | 366 | 383 | 415 | 324 | 299 | 258 | 272 | 271 | 330 | 401 | -- | 335 | 330 | 55 | 16 | 12% |
| 9/17/2006 | 264 | 275 | 374 | 368 | 329 | 334 | 381 | 404 | 343 | 298 | 284 | 420 | -- | 339 | 339 | 52 | 15 | 9% |
| 9/18/2006 | 235 | 319 | 328 | 472 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 338 | 328 | 98 | 49 | 9% |
| 9/19/2006 | 290 | 385 | 353 | 391 | 308 | -- | -- | -- | -- | -- | -- | -- | -- | 346 | 350 | 45 | 20 | 7% |
| 9/20/2006 | 269 | 354 | 405 | 487 | 400 | 357 | 285 | 299 | 323 | 308 | 320 | 360 | -- | 347 | 347 | 61 | 18 | 12% |
| 9/21/2006 | 180 | 359 | 307 | 298 | 332 | 319 | 314 | 570 | 382 | 398 | 225 | 72 | -- | 313 | 314 | 122 | 35 | 12% |
| 9/22/2006 | 362 | 413 | 388 | 285 | 325 | 331 | 384 | -- | 427 | 367 | 319 | 263 | -- | 351 | 356 | 52 | 16 | 5% |
| 9/23/2006 | 293 | 295 | 234 | 277 | 275 | 323 | 279 | 296 | 290 | 280 | 298 | -- | -- | 285 | 287 | 22 | 7 | 3% |
| 9/24/2006 | 245 | 289 | 234 | 291 | 311 | 244 | 266 | 344 | 314 | 282 | 257 | 522 | -- | 300 | 289 | 77 | 22 | 15% |
| 9/25/2006 | 301 | 333 | 330 | 327 | 322 | 302 | 288 | 315 | 323 | 276 | 294 | 227 | -- | 303 | 303 | 30 | 9 | 8% |
| 9/26/2006 | -- | 336 | 298 | 372 | 371 | 380 | 346 | 333 | 337 | 372 | 318 | 308 | -- | 343 | 340 | 28 | 8 | 12% |
| 9/27/2006 | 239 | 278 | 282 | 271 | 311 | -- | 314 | 337 | -- | -- | -- | -- | -- | 290 | 286 | 33 | 12 | 8% |
| 9/29/2006 | 453 | 543 | 643 | 661 | 626 | 543 | 628 | 485 | 590 | 331 | -- | 110 | -- | 510 | 543 | 165 | 50 | 3% |
| 9/30/2006 | -- | -- | 301 | 558 | -- | 346 | 398 | 92 | -- | 246 | -- | -- | -- | 323 | 323 | 155 | 63 | 12% |
| 10/1/2006 | 420 | 447 | 470 | 442 | 483 | 446 | 510 | 442 | 541 | -- | 472 | 497 | 310 | 457 | 457 | 57 | 17 | 4% |
| 10/2/2006 | -- | -- | -- | -- | -- | 363 | 272 | 289 | 258 | 255 | 249 | 300 | -- | 284 | 278 | 40 | 15 | 8% |
| 10/3/2006 | 416 | 546 | 482 | 525 | 529 | 506 | 537 | 480 | 288 | 290 | 282 | 354 | 306 | 426 | 453 | 107 | 30 | 4% |
| 10/5/2006 | 454 | 654 | 541 | 496 | 416 | 415 | 414 | 423 | 411 | 451 | 466 | 338 | -- | 457 | 451 | 80 | 23 | 5% |
| 10/6/2006 | 289 | 467 | 466 | 477 | 543 | 615 | 629 | 469 | 493 | 500 | 413 | -- | 276 | 470 | 470 | 107 | 31 | 5% |
| 10/7/2006 | 350 | 375 | 403 | 494 | 556 | 523 | -- | 511 | 487 | 430 | 282 | 289 | -- | 427 | 428 | 95 | 29 | 7% |
| 10/8/2006 | 276 | 451 | 353 | 417 | 345 | 328 | 346 | 330 | 330 | 331 | 308 | 277 | 467 | 351 | 338 | 60 | 17 | 9% |
| 10/9/2006 | 318 | 404 | 456 | 417 | 443 | 479 | 508 | 504 | 583 | 534 | 418 | 349 | -- | 451 | 451 | 76 | 22 | 3% |
| 10/10/2006 | 251 | 333 | 310 | 238 | 181 | 251 | -- | 178 | -- | 225 | 379 | 259 | 153 | 251 | 251 | 69 | 21 | 21% |
| 10/12/2006 | 193 | 222 | 107 | 286 | 314 | 207 | 207 | 341 | 210 | 237 | -- | 164 | 250 | 228 | 222 | 64 | 19 | 27% |
| 10/13/2006 | 337 | 347 | 321 | 351 | 235 | 377 | 285 | 305 | 287 | 82 | 166 | 195 | 43 | 256 | 286 | 106 | 29 | 24% |
| 10/14/2006 | 443 | 379 | 366 | 290 | -- | 308 | 275 | -- | 185 | 229 | 212 | 197 | 123 | 273 | 274 | 96 | 29 | 18% |
| 10/15/2006 | 92 | 371 | 438 | 443 | 392 | 388 | 606 | 648 | 654 | 631 | 547 | 566 | 484 | 482 | 483 | 156 | 43 | 7% |
| **Entire Season** | **284** | **374** | **371** | **398** | **389** | **374** | **377** | **383** | **385** | **339** | **317** | **313** | **268** | **353** | **339** | **74** | **12** | **9%** |

**Appendix A Table 5.** Results of ceilometer and moonwatching observations with nightly mean weather

| Night of | Radar Results | | | | Ceilometer Results | | | Nightly Mean Weather | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Birds | Bats | Insects | # of Obs Periods | Birds | Bats | Insects | Temperature (F) | Wind Speed (mph) | Wind Direction (from) |
| 9/1/2006 | 99% | 1% | 2% | 2 | 0 | 1 | 2 | 61 | 6 | Calm |
| 9/3/2006 | 100% | 0% | 5% | 11 | 0 | 2 | 85 | 61 | 8 | WNW |
| 9/4/2006 | 100% | 0% | 0% | 10 | 0 | 0 | 135 | 62 | 5 | Calm |
| 9/5/2006 | 100% | 0% | 1% | 10 | 0 | 0 | 53 | 63 | 5 | SSW |
| 9/6/2006 | 100% | 0% | 1% | 9 | 0 | 0 | 7 | 62 | 7 | SSW |
| 9/7/2006 | 100% | 0% | 0% | 4 | 0 | 0 | 11 | 65 | 8 | SSW |
| 9/8/2006 | 100% | 0% | 0% | 3 | 0 | 0 | 9 | 68 | 10 | SSW |
| 9/13/2006 | 100% | 0% | 0% | -- | -- | -- | -- | 65 | 9 | S |
| 9/15/2006 | 96% | 4% | 0% | 9 | 0 | 1 | 25 | 60 | 5 | Calm |
| 9/16/2006 | 81% | 19% | 0% | 11 | 1 | 1 | 14 | 59 | 6 | Calm |
| 9/17/2006 | 87% | 13% | 0% | 10 | 0 | 2 | 12 | 68 | 13 | SSW |
| 9/18/2006 | 86% | 14% | 0% | 4 | 0 | 0 | 10 | 66 | 7 | W |
| 9/19/2006 | 100% | 0% | 0% | 4 | 0 | 0 | 10 | 56 | 8 | SW |
| 9/20/2006 | 99% | 1% | 18% | 10 | 1 | 1 | 13 | 54 | 8 | W |
| 9/21/2006 | 99% | 1% | 0% | 11 | 2 | 2 | 3 | 49 | 7 | S |
| 9/22/2006 | 100% | 0% | 0% | 11 | 0 | 0 | 7 | 64 | 13 | SW |
| 9/23/2006 | 100% | 0% | 0% | 10 | 0 | 0 | 44 | 69 | 14 | SW |
| 9/24/2006 | 100% | 0% | 2% | 10 | 5 | 2 | 50 | 59 | 11 | WNW |
| 9/25/2006 | 98% | 2% | 0% | 10 | 4 | 0 | 30 | 60 | 10 | NW |
| 9/26/2006 | 98% | 2% | 6% | 10 | 6 | 0 | 10 | 54 | 15 | S |
| 9/27/2006 | 100% | 0% | 0% | -- | -- | -- | -- | 60 | 10 | SW |
| 9/29/2006 | 98% | 2% | 2% | 11 | 2 | 0 | 0 | 49 | 11 | S |
| 9/30/2006 | 96% | 4% | 0% | 9 | 0 | 0 | 2 | 54 | 10 | SW |
| 10/1/2006 | 100% | 0% | 0% | 10 | 0 | 0 | 18 | 51 | 4 | South |
| 10/2/2006 | 100% | 0% | 0% | 6 | 0 | 0 | 10 | 64 | 13 | SSW |
| 10/3/2006 | 100% | 0% | 0% | 11 | 0 | 0 | 13 | 59 | 7 | SSW |
| 10/5/2006 | 100% | 0% | 0% | 10 | 2 | 0 | 23 | 43 | 5 | ENE |
| 10/6/2006 | 99% | 1% | 0% | 12 | 1 | 0 | 0 | 44 | 6 | NE |
| 10/7/2006 | 98% | 2% | 0% | 11 | 1 | 0 | 0 | 45 | Calm | Calm |
| 10/8/2006 | 100% | 0% | 4% | 11 | 0 | 0 | 0 | 55 | 5 | SSW |
| 10/9/2006 | 100% | 0% | 0% | 11 | 0 | 0 | 0 | 54 | 4 | Calm |
| 10/10/2006 | 100% | 0% | 0% | 12 | 3 | 0 | 59 | 61 | 10 | SE |
| 10/12/2006 | 100% | 0% | 0% | 8 | 1 | 0 | 32 | 38 | 15 | SW |
| 10/13/2006 | 100% | 0% | 0% | 10 | 0 | 0 | 0 | 48 | 8 | SW |
| 10/14/2006 | 99% | 1% | 0% | 11 | 2 | 0 | 0 | 46 | Calm | Calm |
| 10/15/2006 | 95% | 5% | 0% | 11 | 0 | 0 | 0 | 42 | Calm | Calm |
| **Total** | **97%** | **3%** | **2%** | 313 | 31 | 12 | 687 | | | |

**Appendix A Table 6.** Summary of available fall avian radar survey results

| Project Site | Number of Survey Nights | Number of Survey Hours | Landscape | Average Passage Rate (t/km/hr) | Range in Nightly Passage Rates | Avg. Flight Direction | Avg. Flight Height (m) | % Targets Below Turbine Height | Citation |
|---|---|---|---|---|---|---|---|---|---|
| **Fall 1998** | | | | | | | | | |
| Harrisburg, NY | 35 | n/a | Great Lakes plain/ADK foothills | 122 | n/a | 181 | 182 | 45 | Cooper and Mabee 2000 |
| Wethersfield, Wyoming Cty, NY | 35 | n/a | Agricultural plateau | 168 | n/a | 179 | 154 | 57 | Cooper and Mabee 2000 |
| **Fall 2003** | | | | | | | | | |
| Westfield Chautauqua Cty, NY | 30 | 180 | Great Lakes shore | 238 | 10-905 | 199 | 532 | (125 m) 4 % | Cooper *et al.* 2004c |
| Mt. Storm, Grant Cty, WV | 45 | 270 | Forested ridge | 241 | 8-852 | 184 | 410 | n/a | Cooper *et al.* 2004b |
| **Fall 2004** | | | | | | | | | |
| Franklin, Pendleton Cty, WV | 34 | 349 | Forested ridge | 229 | 18-643 | 175 | 583 | (125 m) 8% | Woodlot 2005a |
| Prattsburgh, Steuben Cty, NY | 30 | 315 | Agricultural plateau | 193 | 12-474 | 188 | 516 | (125 m) 3% | Woodlot 2005b |
| Prattsburgh, Steuben Cty, NY | 45 | 292.5 | Agricultural plateau | 200 | 18-863 | 177 | 365 | (125 m) 9.2% | Mabee *et al.* 2005a |
| Martindale, Lancaster, Cty, PA | n/a | n/a | Reclaimed minelands | 187 | n/a | 188 | 436 | (n/a) 8% | Young 2006 |
| Casselman, Somerset Cty, PA | n/a | n/a | Reclaimed minelands | 174 | n/a | 219 | 448 | (n/a) 7% | Young 2006 |
| Deerfield, Bennington Cty, VT (Existing Facility) | 28 | 300 | Forested ridge | 175 | 7-519 | 194 | 438 | (100 m) <1% | Woodlot 2005c |
| Deerfield, Bennington Cty, VT (Western Expansion) | 14 | 159 | Forested ridge | 193 | 8-1121 | 223 | 624 | (100 m) 5% | Woodlot 2005c |
| Deerfield, Bennington Cty, VT (Valley Site) | 13 | 136 | Forested ridge | 150 | 58-404 | 214 | 503 | (100 m) < 1% | Woodlot 2005c |
| Deerfield, Bennington Cty, VT (3 sites combined) | 28 | 595 | Forested ridge | 178 | 7-1121 | 212 | 611 | (100 m) 3% | Woodlot 2005c |
| Sheffield, Caledonia Cty, VT | 18 | 176 | Forested ridge | 114 | 19-320 | 200 | 566 | (125 m) 1% | Woodlot 2006a |
| **Fall 2005** | | | | | | | | | |
| Churubusco, Clinton Cty, NY | 38 | 414 | Great Lakes plain/ADK foothills | 152 | 9-429 | 193 | 438 | (120 m) 5% | Woodlot 2005l |
| Ellenberg, Clinton Cty, NY | n/a | n/a | Great Lakes plain/ADK foothills | 197 | n/a | 162 | 333 | (n/a) 12% | Mabee *et al.* 2006a |
| Dairy Hills, Clinton Cty, NY | n/a | n/a | Agricultural plateau | 94 | n/a | 180 | 466 | (n/a) 10% | Young et al. 2006 |
| Flat Rock, Lewis Cty, NY | n/a | n/a | Great Lakes plain/ADK foothills | 158 | n/a | 184 | 415 | (n/a) 8% | ED&R 2006a |
| Clayton, Jefferson Cty, NY | 37 | 385 | Agricultural plateau | 418 | 83-877 | 168 | 475 | (150 m) 10% | Woodlot 2005m |
| Bliss, Wyoming Cty, NY | 8 | n/a | Agricultural plateau | 440 | 52-1392 | n/a | 411 | (125 m) 13% | Young 2006 |
| Perry, Wyoming Cty, NY | n/a | n/a | Agricultural plateau | 64 | n/a | 180 | 466 | (125 m) 10% | Young 2006 |
| Sheldon, Wyoming Cty, NY | 36 | 347 | Agricultural plateau | 197 | 43-529 | 213 | 422 | (120 m) 3% | Woodlot 2005n |
| Howard, Steuben Cty, NY | 39 | 405 | Agricultural plateau | 481 | 18-1434 | 185 | 491 | (125 m) 5% | Woodlot 2005o |
| Fairfield, Herkimer Cty, NY | 38 | 423 | Agricultural plateau | 691 | 116-1351 | 198 | 516 | (125 m) 4% | Woodlot 2005p |
| Jordanville, Herkimer Cty, NY | 38 | 404 | Agricultural plateau | 380 | 26-1019 | 208 | 440 | (125 m) 6% | Woodlot 2005q |
| Munnsville, Madison Cty, NY | 31 | 292 | Agricultural plateau | 732 | 15-1671 | 223 | 644 | (118 m) 2% | Woodlot 2005r |
| Deerfield, Bennington Cty, VT | 32 | 324 | Forested ridge | 559 | 3-1736 | 221 | 395 | (100 m) 13% | Woodlot 2005s |
| Kibby, Franklin Cty, ME (Mountain) | 12 | 115 | Forested ridge | 565 | 109-1107 | 167 | 370 | (125 m) 16% | Woodlot 2006d |
| Kibby, Franklin Cty, ME (Range 1) | 12 | 101 | Forested ridge | 201 | 12-783 | 196 | 352 | (125 m) 12% | Woodlot 2006d |
| Kibby, Franklin Cty, ME (Valley Site) | 5 | 13 | Forested valley | 452 | 52-995 | 193 | 391 | (125 m) 16% | Woodlot 2006d |
| Mars Hill, Aroostook Cty, ME | 18 | 117 | Forested ridge | 512 | 60-1092 | 228 | 424 | (120 m) 8% | Woodlot 2005t |
| **Fall 2006** | | | | | | | | | |
| Chateaugay, Franklin Cty, NY | 35 | 327 | Agricultural plateau | 643 | 38-1373 | 212 | 431 | (120 m) 8% | Woodlot 2006j |
| Wethersfield, Wyoming Cty, NY | 56 | n/a | Agricultural plateau | 256 | 31-701 | 208 | 344 | (125 m) 11% | Mabee et al. 2006c |
| Centerville, Allegany Cty, NY | 57 | n/a | Agricultural plateau | 259 | 12-877 | 208 | 350 | (125 m) 12% | Mabee et al. 2006c |
| Lempster, Sullivan Cty, NH | 32 | 290 | Forested ridge | 620 | 133-1609 | 206 | 387 | (125 m) 8% | Woodlot 2007a |
| Stetson, Penobscot Cty, ME | 12 | 77 | Forested ridge | 476 | 131-1192 | 227 | 378 | (125 m) 13% | Woodlot 2007b |

# B Nocturnal Radar and Visual Study, and Acoustic Survey, Spring 2007 (Woodlot Alternatives, Inc.)

# A Spring 2007 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed Ball Hill Windpark in Villenova and Hanover, NY

Prepared for:

Noble Environmental Power, LLC
&
Ecology and Environment, Inc

Prepared by

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30 Park Drive
Topsham, ME 04086

**July 2008**

# Executive Summary

During spring 2007, Woodlot Alternatives, Inc (Woodlot)[1], now Stantec Consulting (Stantec), conducted field surveys of bird and bat nocturnal migration activity at the Ball Hill Windpark in western New York (project). The surveys are part of the planning process by Noble Environmental Power, LLC (Noble), the developer of that site. These surveys represented the spring season of investigation undertaken at this site. Studies included nighttime surveys of birds and bats using a combination of marine radar and bat echolocation detectors.

The results of the field surveys provide useful information about site-specific migration activity and patterns in the vicinity of the project.

*Nocturnal Radar Survey*

The spring field survey targeted 45 nights of sampling from April 15 to May 31, 2007. Of these 45 nights, a total of 40 were sampled, due to periods when sustained inclement weather precluded the collection of radar data. Surveys were conducted using X-band radar, and sampling occurred from sunset to sunrise. Each hour of sampling included the recording of radar video files during horizontal and vertical operation. The radar site provided clear visibility to the northwest, north and east and proved adequate airspace to account for north bound migration.

The overall mean passage rate for the entire survey period was 419 ± 40 t/km/hr. The median passage rate was 391 t/km/hr. Nightly passage rates varied from 22 ± 7 targets per kilometer per hour (t/km/hr) to 1190 ± 94 t/km/hr. Mean flight direction through the project area was 10º ± 70º.

The mean flight height of targets was 493 m ± 28 m (1617’ ± 92’) above the radar site. The average nightly flight height ranged from 177 m ± 60 m (581’ ± 197’) to 917 m ± 49 m (3009’ ± 161’). The percent of targets observed flying below 120 m (394’) also varied by night, from 0.4 percent to 64 percent. The seasonal average percentage of targets flying below 120 m was 3 percent.

The mean flight direction, qualitative analysis of the surrounding topography and landscape, and mean flight altitude of targets passing over the project area indicates that bird migration in this area involves a broad front type of landscape movement, rather than a concentration or funneling of flight movements over or through any particular part of the project area. This type of broad front movement, particularly in conjunction with the high flight heights, demonstrates a

[1] All field work and any reporting and permitting activities performed prior to October 1, 2007, were conducted as Woodlot Alternatives, Inc. and will be herein referenced as work done by Woodlot. On October 1, 2007, Woodlot Alternatives, Inc. was acquired by Stantec Consulting Services, Inc. Work conducted on or after October 1, 2007 is herein referenced as work done by Stantec.

limited bird mortality risk during spring migration. Additionally, the flight height of targets indicates that the vast majority of bird migration in the area occurs well above the height of the proposed wind turbines.

*Spring Bat Survey*

The spring field survey included documentation of spring bat activity through passive surveys with two acoustic detectors, resulting in 86 detector-nights of recordings from March 28 to May 30, 2007. Both detectors were deployed in a meteorological measurement tower. A total of 78 bat call sequences were recorded during the spring sampling. The mean detection rate of all detectors was 0.9 detections per detector-night. The detection rate was generally lower than other recent spring studies in New York and the region. Habitat, landscape, location, and survey effort likely account for the observed differences.

Bat calls were identified to the lowest possible taxonomic level. Calls were then grouped into four guilds based on call characteristics, because the frequency division detectors do not adequately differentiate among similar calls of some species. The majority of calls (45%) were identified as unknown. Of the calls that were identified to species or guild, those of the *Myotis* guild were the most common (33% of all call sequences), followed by the species within the big brown/silver-haired/hoary bat guild (22% of all call sequences). There were no calls identified as red bat or eastern pipistrelle. This trend in species composition is similar to that of other studies in the region.

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PN195600173/106193

# 1.0 Introduction

## 1.1 PROJECT CONTEXT

Noble Environmental Power, LLC (Noble) has proposed the construction of a wind energy facility located in Villenova and Hanover, New York (project; Figure 1-1). The project is located on an agricultural plateau surrounded by gently slopping flat-topped ridges, characteristic of the Cattaraugus Highlands. The project area is approximately 12.9 kilometers (8 miles) southeast of Lake Erie and is largely agricultural with approximately 30 percent of the landscape forested with oak-dominated hardwoods. Topographic elevations range from 457 to 518 meters (m) (1,500 to 1,700 feet [']).

Woodlot Alternatives, Inc. (Woodlot), now Stantec Consulting (Stantec)[2], conducted a radar survey of nocturnal migration in the project area during spring 2007 migration period. This is the second of two seasons of radar surveys conducted at this project. The overall goal of the radar survey was to document spring nocturnal migration in the vicinity of the project area, including the number of migrants, their flight direction, and their flight altitude. Completion of this effort provides a full year (spring and fall) of nocturnal migration survey dates for the project area.

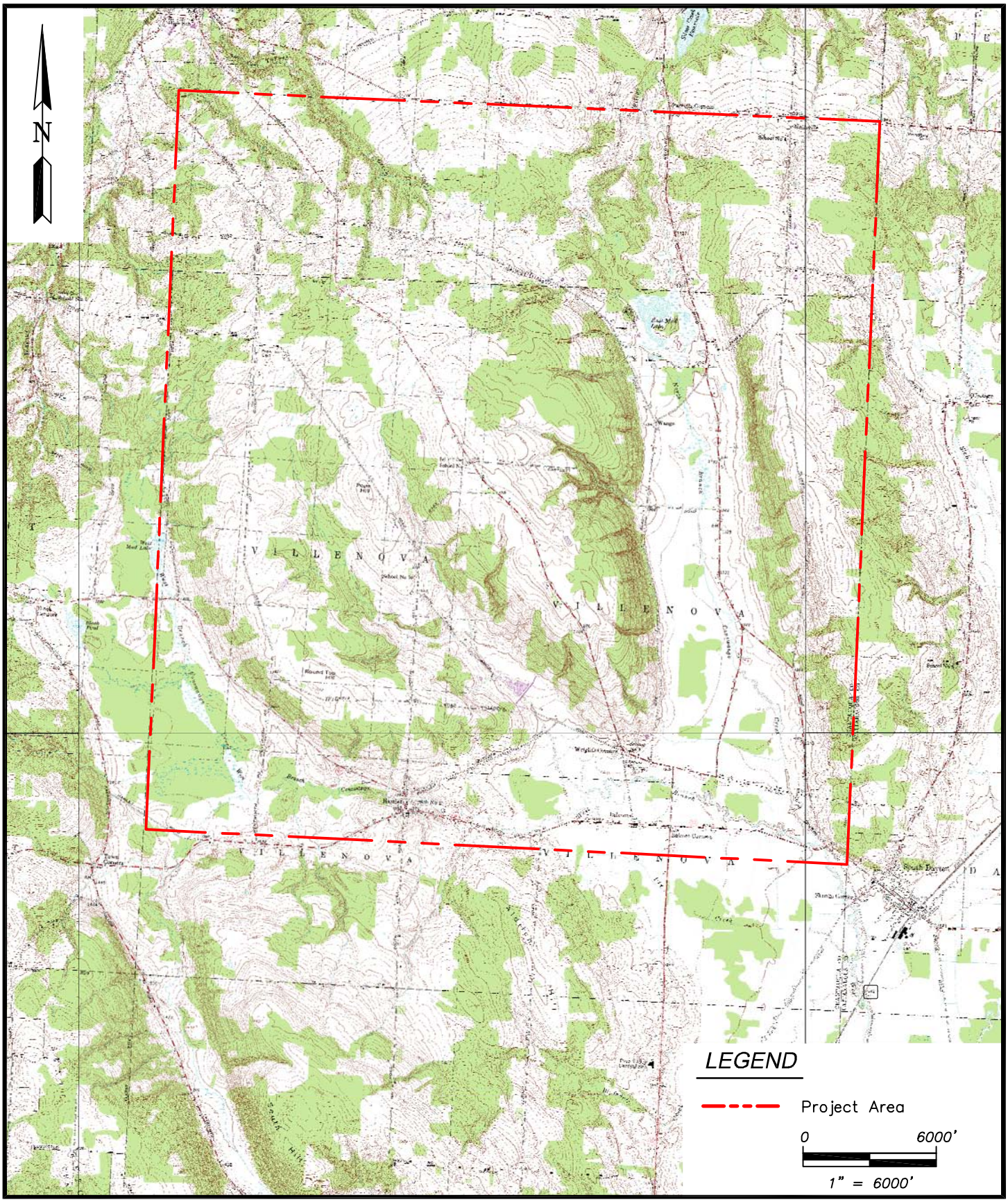
## 1.2 SURVEY OVERVIEW

Woodlot conducted independent field investigations, or surveys, for bird and bat migration during spring 2007. The overall goals of the investigations were to document:

- Passage rates for nocturnal migration in the vicinity of the project area, including the number of migrants, their flight direction, and their flight altitude; as well as,
- Activity patterns and species composition for bats in the project area, including the rate of occurrence and relationship with weather factors.

Following is a brief description of the project; a review of the methods used to conduct scientific surveys and the results of those surveys; a discussion of those results; and the conclusions reached based on those results.

[2] All field work and any reporting and permitting activities performed prior to October 1, 2007, were conducted as Woodlot Alternatives, Inc. and will be herein referenced as work done by Woodlot. On October 1, 2007, Woodlot Alternatives, Inc. was acquired by Stantec Consulting Services, Inc. Work conducted on or after October 1, 2007, is herein referenced as work done by Stantec.




PREPARED BY:

Stantec

WOODLOT

106193-F101-locus.dwg

SHEET TITLE:

Project Location Map

PROJECT:

Proposed Noble Ball Hill Windpark
Villenova and Hanover, New York

DATE: July 2007
SCALE: 1"=6000'
PROJ. NO.: 106193
FIGURE:
1-1

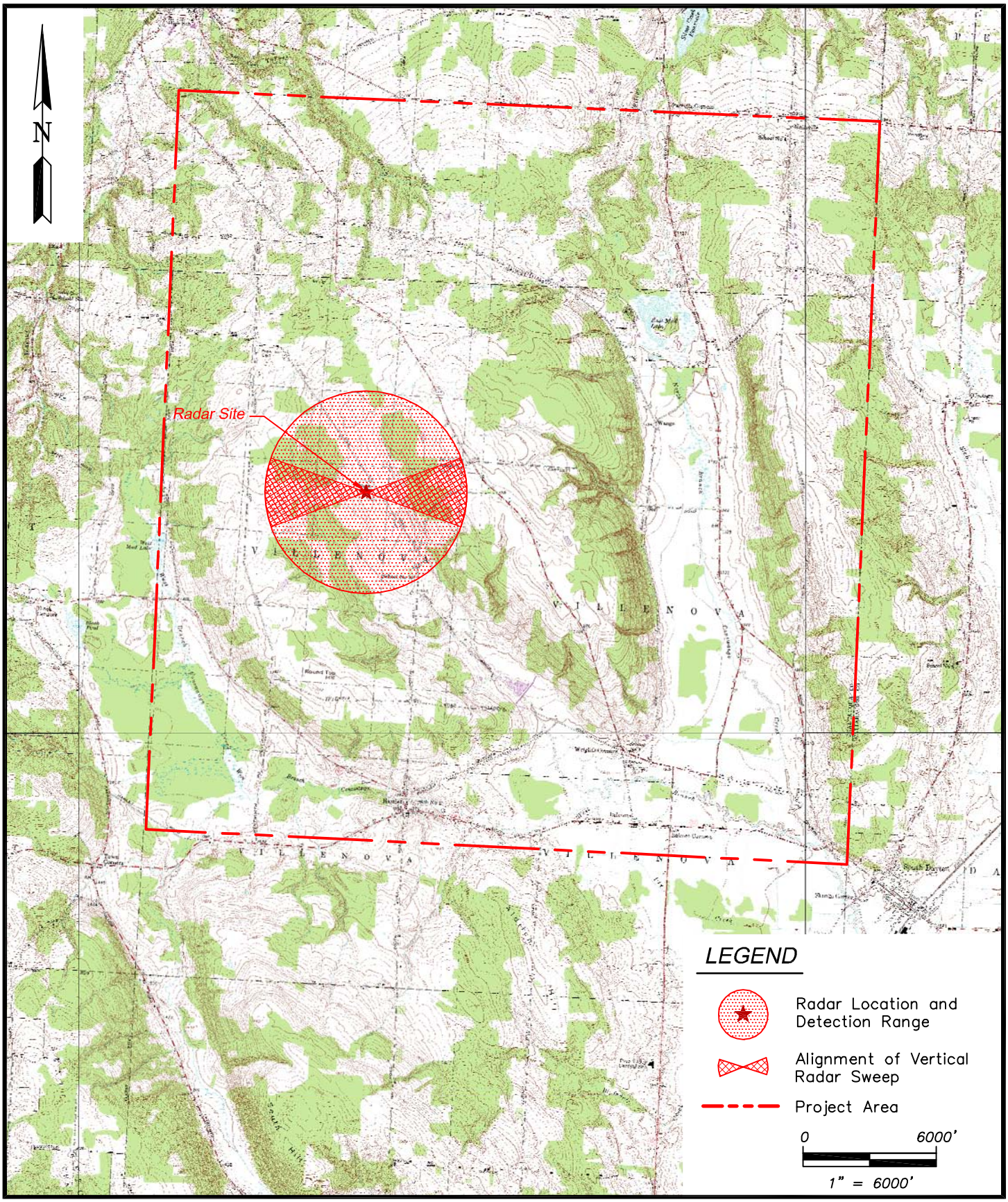
# 2.0 Nocturnal Radar Survey

## 2.1 FIELD METHODS

The radar study was conducted in a former agricultural field, at an elevation of 512 m (1,679'). The site provided a moderate view in most directions (Figure 2-1). Marine surveillance radar similar to that described by Cooper *et al.* (1991) was used during field data collection. The radar has a peak power output of 12 kW and has the ability to track small animals, including birds, bats, and even insects, based on settings selected for the radar functions. It cannot, however, readily distinguish among different types of animals being detected. Consequently, all animals observed on the radar screen were identified as "targets." The radar has an "echo trail" function which captures past echoes of the flight paths of targets, enabling determination of flight direction. During all operations, the radar's echo trail was set to 30 seconds.

The radar was equipped with a 2 m (6.5') waveguide antenna. The antenna has a vertical beam height of 20º (10º above and below horizontal) and the front end of the antenna was inclined approximately 5º to increase the proportion of the beam directed into the sky.

Objects on the ground detected by the radar cause returns on the radar screen (echoes) that appear as blotches called ground clutter. Large amounts of ground clutter reduce the ability of the radar to track birds and bats flying over those areas. However, vegetation and hilltops near the radar can be used to reduce or eliminate ground clutter by 'hiding' clutter-causing objects from the radar. These nearby features also cause ground clutter but their proximity to the radar antenna generally limits the ground clutter to the center of the radar screen (Figure 2-2). The presence of ground clutter and other objects that could reduce clutter are important factors to be considered during the site selection process. At the radar location, local topography provided good views in most directions, although the southeastern view was obstructed by a low-lying forested wetland.




PREPARED BY:
Stantec
WOODLOT
106193-F201-radar.dwg

SHEET TITLE:
Radar Location Map

PROJECT:
Proposed Noble Ball Hill Windpark
Villenova and Hanover, New York

DATE: July 2007
SCALE: 1"=6000'
PROJ. NO.: 106193
FIGURE:
2-1

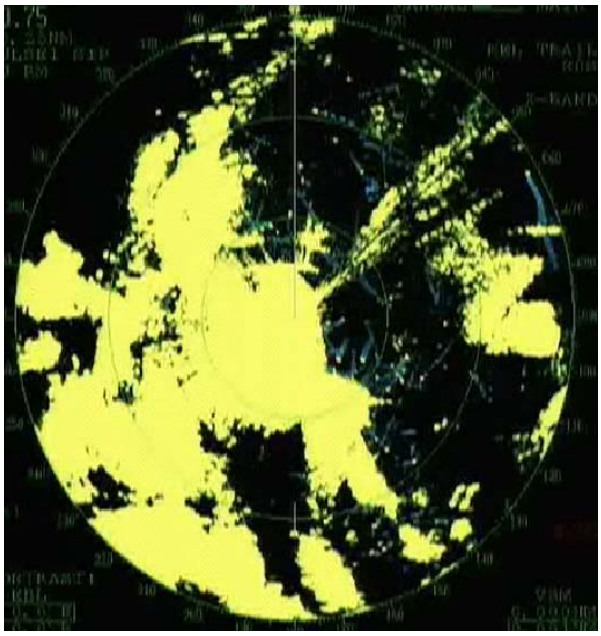


**Figure 2-2.** Ground clutter in the Ball Hill project area during spring 2007 radar survey

Radar surveys were conducted from sunset to sunrise. Forty-five nights of surveys were targeted for sampling between April 15 and May 31, 2007. Because the anti-rain function of the radar must be turned down to detect small songbirds and bats, surveys could not be conducted during periods of inclement weather; consequently, 40 of the 45 targeted nights were subsequently surveyed. However, in order to characterize migration patterns during nights without optimal conditions, some nights with weather events including occasional showers were sampled.

The radar was operated in two modes throughout the night. In the first mode, surveillance, the antenna spins horizontally to survey the airspace around the radar and detects targets moving through the area. By analyzing echo trails, the flight direction of targets can be determined. In the second mode of operation, vertical, the antenna is rotated 90º to vertically survey the airspace above the radar (Harmata *et al.* 1999). In vertical mode, target echoes do not provide directional data but do provide information on the altitude of targets passing through the vertical, 20º radar beam. Both modes of operation were used during each hour of sampling.

The radar was operated at a range of 1.4 km (0.75 nautical miles). At this range, the echoes of small birds can be easily detected, observed, and tracked. At greater ranges, larger birds can be detected but the echoes of small birds are reduced in size and restricted to a smaller portion of the radar screen, reducing the ability to observe the movement pattern of individual targets.

## 2.2 DATA COLLECTION

The radar display was connected to video recording software of a computer. Based on a random sequence for each night, approximately 25 minutes of video samples were recorded during each hour of operation. These included 15 one-minute horizontal samples and 10 one-minute vertical samples.

During each hour, additional information was also recorded, including weather conditions and ceilometer observations. Ceilometer observations involved directing a one-million candlepower spotlight vertically into the sky in a manner similar to that described by Gauthreaux (1969). The ceilometer beam was observed by eye for 5 minutes to document and characterize low-flying (below 120 m [394']) targets. The ceilometer was held in-hand so that any birds, bats, or insects passing through it could be tracked for several seconds, if needed. The number of birds, bats, and insects were recorded during each ceilometer observation period. This information was used during data analysis to help characterize activity of birds, bats, and insects. On cloud-free nights, when the moon was full and light was too diffuse to observe targets moving through the ceilometer beam, the moon-watch technique was used. Similar to the ceilometer, the moon-watch involves a 5-minute observation period during which time the observer trains a pair of binoculars at the full, or near full moon and counts the numbers of migrants observed.

## 2.3 DATA ANALYSIS

Video samples were analyzed using a digital analysis software tool developed by Woodlot. For horizontal samples, targets were identified as birds and bats rather than insects based on their speed. The speed of targets was corrected for wind speed and direction; targets traveling faster than approximately 6 meters (20') per second (m/s) were identified as a bird or bat target (Larkin 1991, Bruderer and Boldt 2001). The software tool recorded the time, location, and flight vector for each target traveling fast enough to be a bird or bat. The results for each sample were output to a spreadsheet. For vertical samples, the software tool recorded the entry point of targets passing through the vertical radar beam, the time, and flight altitude above the radar location. The results for each sample were output to a spreadsheet. These datasets were then used to calculate mean and median passage rate (reported as targets per kilometer of migratory front per hour), flight direction, and flight altitude of targets.

Mean target flight directions (± 1 circular standard deviation) were summarized using software designed specifically to analyze directional data (Oriana2© Kovach Computing Services). The statistics used for this analysis are based on Batschelet (1965), which take into account the circular nature of the data. Nightly wind direction was also summarized using similar methods and data collected from the nearest meteorological measurement tower (met tower) to the radar.

Flight altitude data were summarized using linear statistics. Mean and median flight altitudes (± 1 standard error) were calculated by hour, night, and overall season. The percent of targets

flying below 120 m (394'), the approximate maximum height of the proposed wind turbines, was also calculated hourly, for each night, and for the entire survey period.

## 2.4 RESULTS

Radar surveys were conducted during 40 of the 45 targeted nights between April 15 and May 31, 2007 (Appendix A, Table 1). The radar site provided generally good visibility of the surrounding airspace, and targets were observed in most areas of the radar display unit.

### 2.4.1 Passage Rates

Nightly passage rates varied from 22 ± 7 targets per kilometer per hour (t/km/hr) (April 17) to 1190 ± 94 t/km/hr (May 8), and the overall mean passage rate for the entire survey period was 419 ± 40 t/km/hr (Figure 2-3; Appendix A, Table 2), with a median passage rate of 391 t/km/hr. On nights with highest observed passage rates, the wind was typically from the southwest. Individual hourly passage rates varied throughout the entire season from 0 to 1431 t/km/hr (Appendix A, Table 2). Hourly passage rates varied throughout each night and for the season overall. Mean passage rates increased from sunrise to the third hour after sunset and remained at this level until the sixth hour after sunset when the mean rate steadily decreased until sunrise (Figure 2-4).

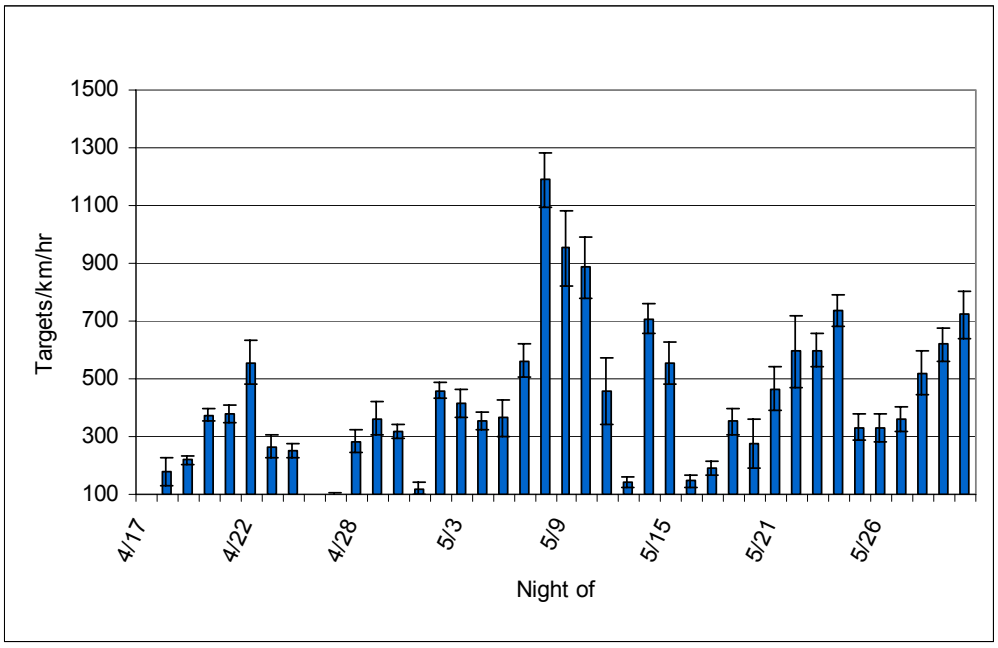



**Figure 2-3.** Nightly mean passage rates observed (error bars ± 1 SE) – spring 2007[3]

[3] Figure does not include any data for nights when survey was not conducted. On April 26, the passage rate was less than 100 t/km/hr.

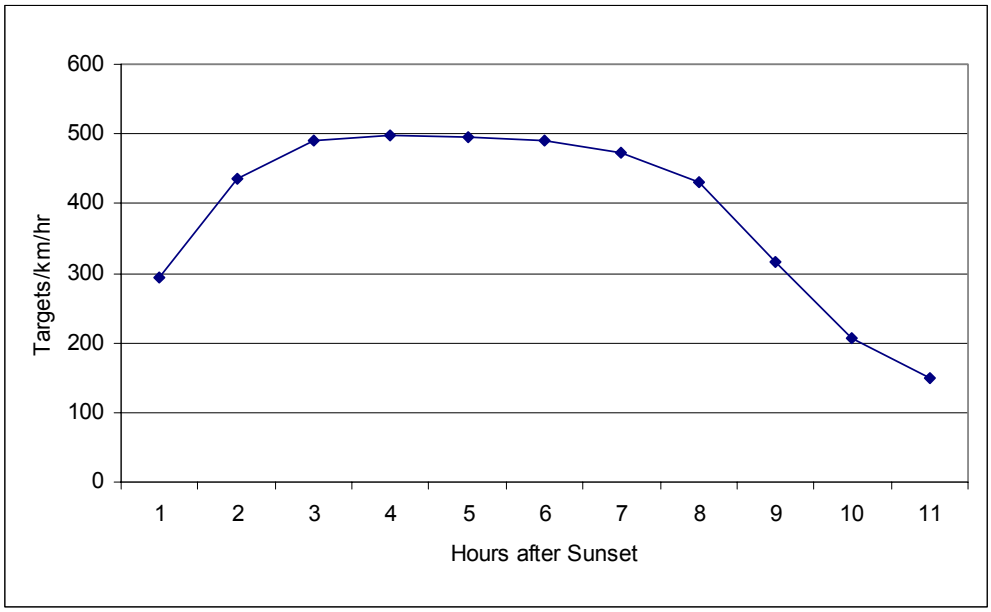



**Figure 2-4.** Hourly passage rates for entire season – spring 2007

### 2.4.2 Flight Direction

Mean flight direction through the project area was 10º ± 70º (Figure 2-5). There was considerable night-to-night variation in mean direction, although most nights included flight directions generally to the north and northeast (Appendix A, Table 3).

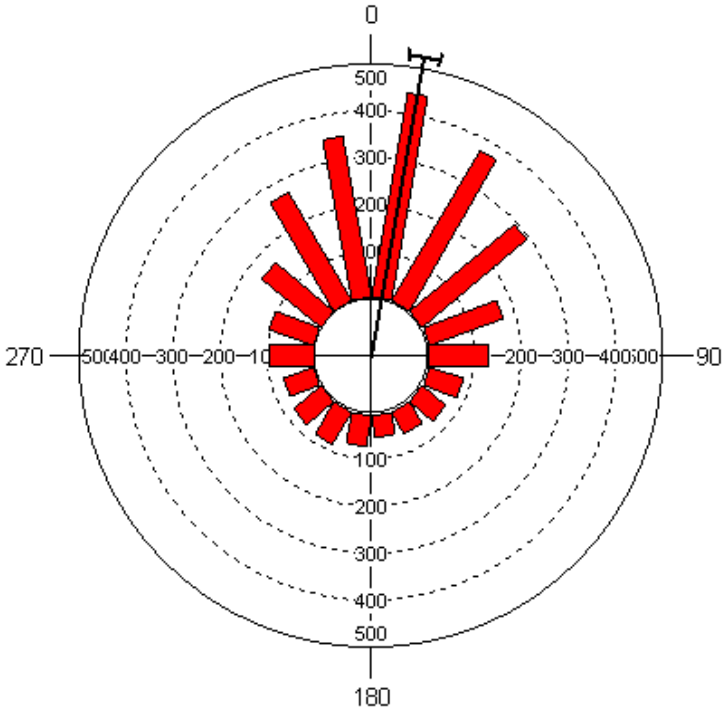



**Figure 2-5.** Flight directions for the entire season with mean flight direction indicated (bracket along the margin of the histogram is the 95% confidence interval for the seasonal mean flight direction) – spring 2007

### 2.4.3 Flight Altitude

The mean flight height of all targets was 493 m ± 28 m (1617' ± 92') above the radar site and the median flight height was 465 m (1526'). The average nightly flight height ranged from 177 m ± 60 m (581' ± 197') on April 17 to 917 m ± 49 m (3009' ± 161') on May 4 (Figure 2-6; Appendix A, Table 4). The percentage of targets observed flying below 120 m (394') also varied by night, from 0.4 percent to 64 percent (Figure 2-7). The seasonal average of targets flying below 120 m (394') was 3 percent. Hourly flight height peaked from 2 to 3 hours after sunset and decreased significantly right before sunrise (Figure 2-8).

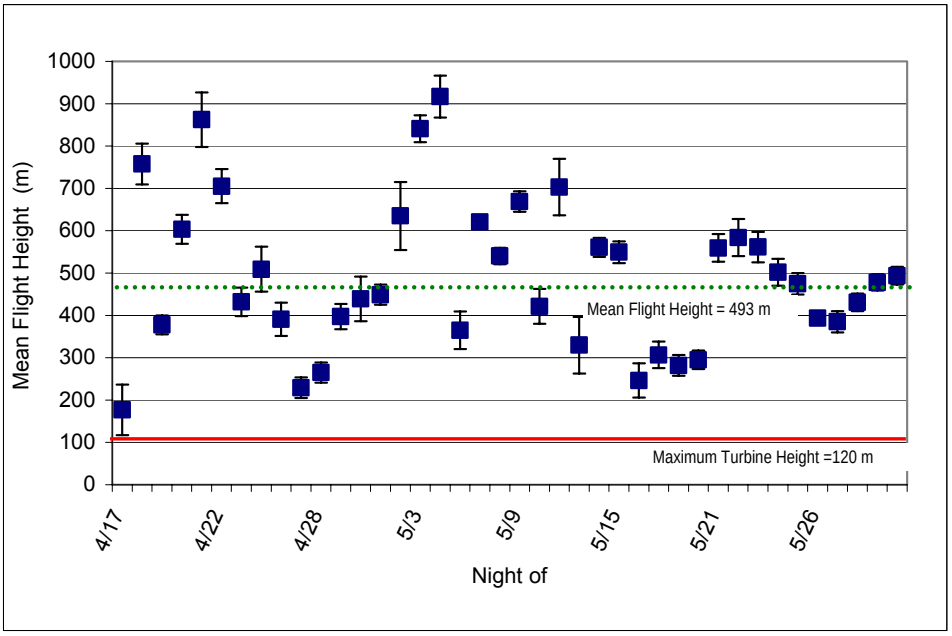



**Figure 2-6.** Mean nightly flight height of targets (error bars ± 1 SE)

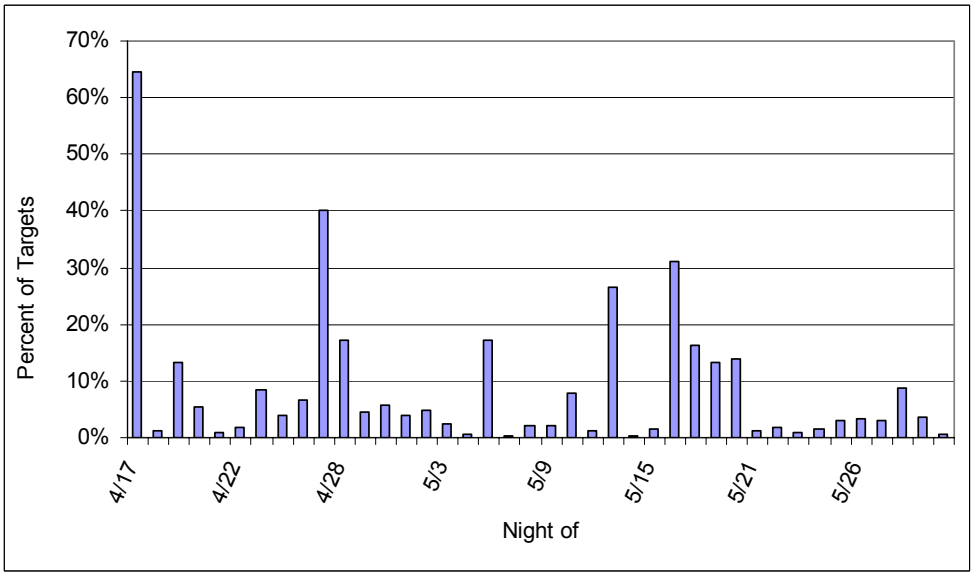



**Figure 2-7.** Percent of targets observed flying below a height of 120 m (394')

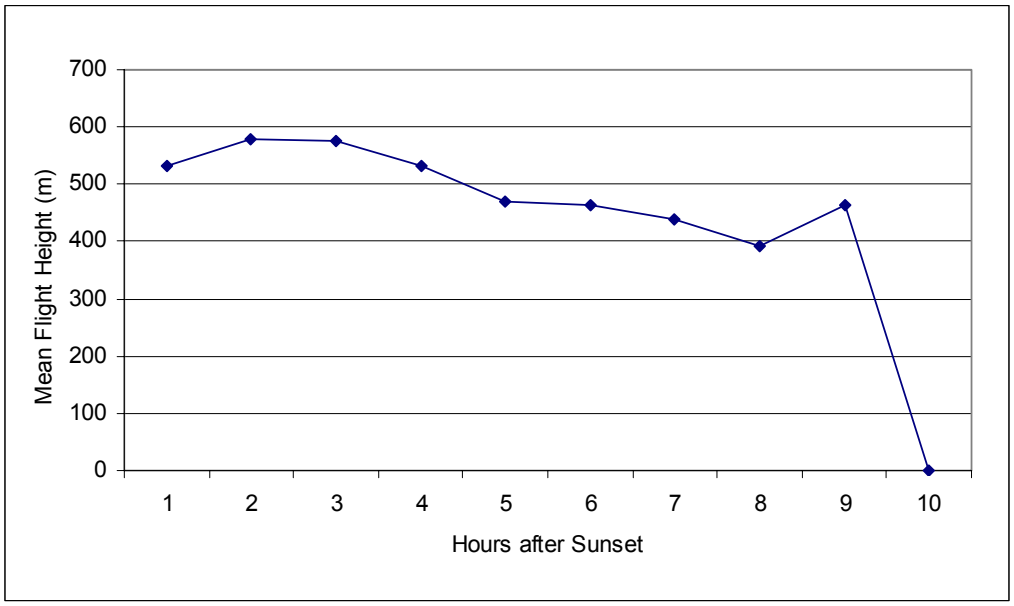



**Figure 2-8.** Hourly target flight height distribution

### 2.4.4 Ceilometer and Moonwatching Observations

Ceilometer and moonwatching data collected during the radar survey yielded a total of 157 five-minute observations. Those observations resulted in only 4 bird and 13 bat sightings in the ceilometer beam or face of the moon, and also resulted in 107 insect observations. In comparison, 2 percent of targets documented (total targets = 30,819) during radar surveys were identified as possible bats. One percent of all targets was identified as insects and not included in calculations of passage rates.

## 2.5 DISCUSSION

Spring 2007 radar surveys documented migration activity and patterns in the vicinity of the project area. In general, migration activity and flight patterns varied among and within nights, which is very typical of nighttime migration. Nightly variation in the number of and flight characteristics of nocturnally-migrating songbirds is not uncommon and is often attributed to weather patterns, such as cold fronts and winds aloft (Hassler *et al.* 1963, Gauthreaux and Able 1970, Richardson 1972, Able 1973, Bingman *et al.* 1982, and Gauthreaux 1991).

Radar surveys using similar methods and equipment conducted within the last several years are rapidly becoming available. These other studies provide an opportunity to reference the results from the Ball Hill Windpark to other areas of New York, the Northeast, and the central Appalachian states. However, there are limitations in comparing data from previous years with data from 2007, as year-to-year variation in continental bird populations and weather patterns may effect how many birds migrate through an area or region. Additionally, differences in site characteristics at each radar survey location, particularly the landscape and vegetation

surrounding a radar site, can play a significant role in any radar's ability to detect targets in all directions around it and the subsequent calculation of passage rate. This last factor must be recognized as one of the most, if not the most, significant limiting factors in making direct site-to-site comparisons in passage rates from radar data. As mentioned previously, the radar site at Ball Hill provided moderate views of the surrounding landscape and some limitations in the radar's visibility occurred. Conversely, the consideration of potential landscape and vegetation effects on radar visibility is not as important for the calculation of flight height, as the main portion of the radar beam is directed skyward, rather than in a 360° horizontal plane around the radar.

Regardless of any potential differences among site conditions at radar survey locations, the nightly mean passage rates observed at the proposed Ball Hill Windpark (seasonal mean of 419 t/km/hr) was within the higher range of other available studies (Appendix A, Table 6). Currently in the wind power industry, there is no direct correlation between passage rates and risk of collisions with wind turbines, and it is not known precisely how passage rate calculated with this method translates to overall fatalities. While conventional wisdom might be to assume that increased passage rate may translate to measurable increases in fatalities, overall documented bird mortality at wind facilities has been low, so there may instead be a critical threshold at which the likelihood of collisions increases more significantly.

Some research suggests that bird migration may be affected by landscape features, such as coastlines, large river valleys, and mountain ranges. This preference has been documented for diurnally-migrating birds, such as raptors, but is not as well established for nocturnally migrating birds (Sielman *et al*. 1981; Bingman *et al*. 1982; Bruderer and Jenni 1990; Richardson 1998; Fortin *et al*. 1999; Williams *et al.* 2001; Diehl *et al*. 2003; Woodlot, unpublished data). Research evidence suggests that night-migrating birds are typically affected by areas of varied topography, such as the most rugged areas of the northern Appalachians and the Alps. The landscape around the project consists of rolling farmfields with elevation differentials of less than 60 m (197'). This differential is considerably less than in those areas where potential topographic effects on flight direction have been observed. The mean flight direction of 10 ± 70º suggests migrants use a broad front migratory path across the project area, rather than a concentration or funneling of flight movements over or through any particular part of the project area. The proximity of the project to Lake Erie and its location relative to the lake did not appear to affect passage rates at Ball Hill during spring migration, as it may have during fall migration during 2006.

The emerging body of studies characterizing nighttime bird movements shows a relatively consistent trend in regards to the altitude at which night migrants fly (Appendix A, Table 6). In general, nighttime migration typically occurs several hundred meters or more above the ground. The range in mean flight heights for all surveys is approximately 300 m (1,000') to 600 m (2,000') above the radar location (Appendix A, Table 6). The percentage of targets documented at heights below that of typical modern wind turbines is variable, but is usually ten to twenty percent (Appendix A, Table 6). At Ball Hill, a higher percentage of targets (≥ 20%) were observed below 120 m on four nights throughout the season. All of these nights included very

low mean passage rates of less than 250 t/km/hr. Overall, the mean flight height documented in the project area (493 m; 1,617') is well within the range of other studies in the region.

The mean flight altitude of targets documented during this study further supports the presumption that topographic features are not affecting migration patterns, particularly flight direction. The mean flight altitude being high above the radar, which was located near the top of a plateau, indicates that most birds are flying so high that their flight is unimpeded by topographic features, such as the hilltops of the project area.

### 2.6 CONCLUSIONS

Radar surveys during the spring 2007 migration period have provided important information on nocturnal bird migration patterns in the vicinity of the project. The results of the surveys indicate that bird migration patterns are generally similar to patterns observed at other sites in the region.

Migration activity varied throughout the season, which is probably largely attributable to weather patterns. The mean passage rate is within, but slightly above, the range in passage rates observed at similar studies. The combination of the flight height and flight direction data indicates that that the majority of the migrants are flying at altitudes well above the agricultural hilltops of the project area and are unimpeded by topography. The flight height data also suggests that the majority of migration during the spring survey period took place well above the height of the proposed turbines. The percent of targets flying below turbine height was near the low end of the range observed at other sites.

## 3.0 Acoustic Bat Survey

### 3.1 INTRODUCTION

To document bat activity patterns in the proposed project area, Woodlot conducted acoustic monitoring surveys with Anabat detectors during spring 2007. Acoustic bat detectors allow for long-term monitoring of activity patterns of bats in a variety of habitats, including the air space approaching the rotor-swept zone of modern wind turbines. The acoustic bat survey at Ball Hill was designed to document bat activity patterns near the rotor zone of the proposed turbines and at an intermediate height. Acoustic surveys were also intended to document bat activity patterns in relation to weather factors including temperature and relative humidity.

Nine species of bats occur in New York, based upon their normal geographical range. These are the little brown bat (*Myotis lucifugus*), northern long-eared bat, (*M. septentrionalis*), Indiana bat (*M. sodalis*), eastern small-footed bat (*M. leibii*), silver-haired bat (*Lasionycteris noctivagans*), eastern pipistrelle (*Pipistrellus subflavus*), big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), and hoary bat (*L. cinereus*) (Whitaker and Hamilton 1998). Of these, the Indiana bat is listed as federally endangered, and the small-footed bat is a state-listed species of special concern. According to the New York Department of Environmental

Conservation (NYSDEC), ten Indiana bat hibernacula are present in New York, located in Albany (1), Essex (2), Jefferson (1), Onondaga (1), Ulster (4), and Warren (1) counties. Essex, Warren, Albany, and Ulster counties are located in a north-south band along the Hudson River, whereas Jefferson and Onondaga counties are located more than 250 km (156 miles) northeast of Ball Hill, near the center of the state.

## 3.2 METHODS

### 3.2.1 Field Surveys

Anabat II detectors (Titley Electronics Pty Ltd.) were used for the duration of the spring 2007 acoustic bat survey. Each Anabat detector was coupled with CF Storage ZCAIM (Titley Electronics Pty Ltd.), which programmed the on/off times and stored data on removable 1 GB compact flash cards. Anabat detectors, which record the bat calls for subsequent analysis, are frequency division detectors that divide the frequency of ultrasonic calls made by bats by a factor of 16 so that they are audible to humans. Anabat detectors were selected based upon their widespread use for this type of survey, their ability to be deployed for long periods of time, and their ability to detect a broad frequency range, which allows detection of all species of bats that could occur in the project area.

Two detectors were deployed in a met tower in the project area. These were passive surveys, as the detectors were placed at the site and left there for the duration of the study. The detectors were placed at heights of approximately 20 m (66'), and 40 m (132') above the ground using the on-site met tower near the radar site. Deployment in this fashion allowed for data collection at two different heights. The met tower used for this was in an agricultural field in a west-central location in the project area (Figure 3-1). Detectors were deployed on March 28 and retrieved on May 31, 2007. Detectors were programmed to record nightly from 7:00 pm to 7:00 am. Detectors were powered by 12-volt batteries charged by solar panels.

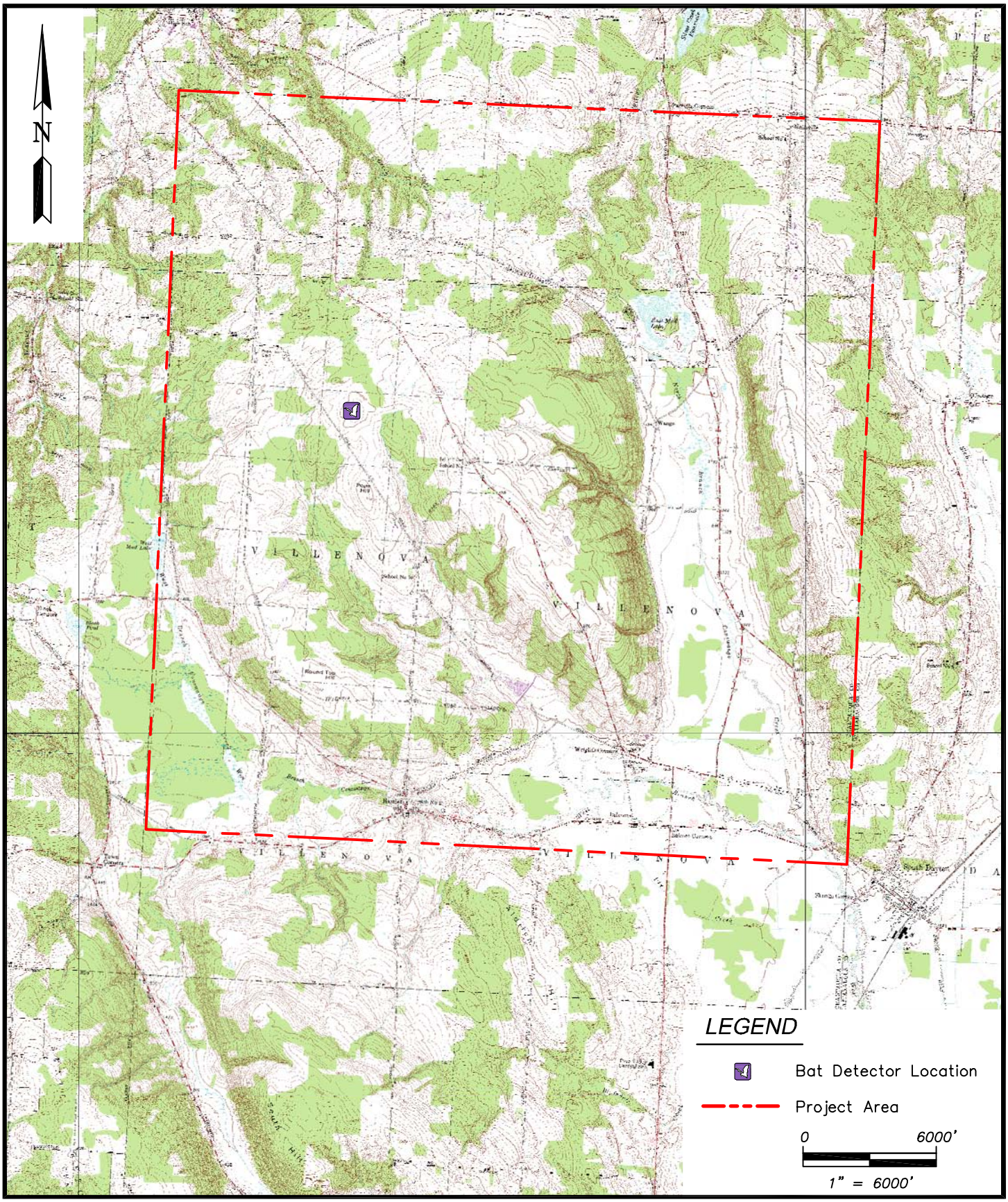
Each solar-powered Anabat system was deployed in a waterproof housing enabling the detector to record while unattended for the duration of the survey. The housing suspends the Anabat microphone downward to give maximum protection from precipitation. To compensate for the downward position, a reflector shield of smooth plastic is placed at a 45-degree angle directly below the microphone. The angled reflector allows the microphone to record the airspace horizontally surrounding the detector and is only slightly less sensitive than an unmodified Anabat unit.

Maintenance visits were conducted approximately every two weeks to check on the condition of the detectors and download data to a computer for analysis. The sensitivity of each Anabat system was set at between six and seven to maximize sensitivity while limiting ambient background noise and interference. The sensitivity of individual detectors was tested using an ultrasonic Bat Chirp (Reno, Nevada) to ensure that the detectors would be able to detect bats up to a distance of at least 10 m (33').

### 3.2.2 Data Analysis

Potential call files were extracted from data files using CFCread© software. The default settings for CFCread© were used during this file extraction process, as these settings are recommended for the calls or call sequences that are characteristic of northeastern bats. A call is a single pulse of sound produced by a bat. A call sequence is a combination of two or more pulses recorded in a call file. This software screens and filters all data recorded by the bat detector and extracts only those files with potential bat calls. Using the default settings for this initial screen also ensures comparability among data sets. Settings used by the filter include a max TBC (time between calls) of 5 seconds, a minimum line length of 5 milliseconds, and a smoothing factor of 50. The smoothing factor refers to whether or not adjacent pixels can be connected with a smooth line. The higher the smoothing factor, the less restrictive the filter is and the more noise files and poor quality call sequences are retained within the data set. Understanding these parameters of these settings is important in terms of determining when individual calls are classified as “unknown”.

Following extraction of call files, each retained file was visually inspected to ensure that files created by static or some other form of interference that were still within the frequency range of northeastern bats were not included in the data set. Bat calls typically include a series of pulses characteristic of normal flight or prey location (“search phase” calls) and capture periods (feeding “buzzes”) and visually look very different than static, which typically forms a diffuse band of dots at either a constant frequency or widely varying frequency, caused by wind, vibration, or other interference. Using these pulse characteristics, bat call files are easily distinguished from non-bat files.




PREPARED BY:

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WOODLOT

106193-F301-bat.dwg

SHEET TITLE:

Bat Detector Location Map

PROJECT:

Proposed Noble Ball Hill Windpark
Villenova and Hanover, New York

DATE: July 2007

SCALE: 1"=6000'

PROJ. NO.: 106193

FIGURE:

3-1

Bat call sequences were individually marked and categorized by species group, or "guild" based on visual comparison to reference calls. Qualitative visual comparison of recorded call sequences of sufficient length to reference libraries of bat calls allows for relatively accurate identification of bat species (O'Farrell *et al*. 1999, O'Farrell and Gannon 1999). A call sequence was considered of suitable quality and duration if the individual call pulses were "clean" (i.e., consisting of sharp, distinct lines) and at least five pulses were included within the sequence. Call sequences were classified to species whenever possible, based on criteria developed from review of reference calls collected by Chris Corben, the developer of the Anabat system, and other bat researchers. However, due to similarity of call signatures among several species, all classified calls have been categorized into four guilds for presentation in this report. This classification scheme follows that of Gannon *et al.* (2003) and is as follows:

- **Myotid (MYSP)** – All bats of the genus *Myotis*. While there are some general characteristics believed to be distinctive for several of the species in this genus, these characteristics do not occur consistently enough for any one species to be relied upon at all times when using Anabat recordings;

- **Red bat/pipistrelle (RBEP)** – Eastern red bats and eastern pipistrelles. Like many of the other northeastern bats, these two species can produce calls distinctive only to each species. However, significant overlap in the call pulse shape, frequency range, and slope can also occur.

- **Big brown/silver-haired/hoary bat (BBSHHB)** – This guild will be referred to as the big brown guild. These species' call signatures commonly overlap and have therefore been included as one guild in this report, and;

- **Unknown (UNKN) –** All call sequences with too few pulses (less than five) or of poor quality (such as indistinct pulse characteristics or background static). These calls were further identified as either "high frequency unknown" (HFUN) for calls above 35 kHz or "low frequency unknown" (LFUN) for calls below 35 kHz**.**

This guild grouping represents the most conservative approach to bat call identification (Hayes 2000). Since some species do sometimes produce calls unique only to that species, all calls were identified to the lowest possible taxonomic level before being grouped into the listed guilds. Tables and figures in the body of this report will reflect those guilds. However, since species-specific identification did occur in some cases, each guild will also be briefly discussed with respect to potential species composition of recorded call sequences.

Once all of the call files were identified and categorized in appropriate guilds, nightly tallies of detected calls were compiled. Mean detection rates (number of calls/detector-night) for the entire sampling period were calculated for each detector and for both detectors combined. It is important to note that detection rates indicate only the number of calls detected and do not necessarily reflect the number of individual bats in an area. For example, a single individual can produce one or many call files recorded by the bat detector, but the bat detector cannot differentiate among individuals of the same species or similar sounding species producing those

calls. Consequently, detections recorded by the bat detector system could over-represents the actual number of animals that produced the recorded calls.

### 3.2.3 Ceilometer and Radar Data

Nocturnal radar surveys and hourly ceilometer surveys were also conducted concurrently with the acoustic bat monitoring on 40 nights during the spring sampling period. While conclusive differentiation between bats and birds is not possible using radar, work conducted by Woodlot using radar and thermal imaging cameras indicates that nocturnal targets that move erratically or in curving paths are typically bats, while those with straight flight paths are birds. Additionally, while bats can create radar flight paths more similar to birds (i.e., straight flight path), no birds were observed creating the erratic radar flight paths observed to be created by some bats (Woodlot, unpublished observations)[4].

Targets with erratic flight paths, similar to those previously observed to be created by bats, were noted during the analysis of the radar video data. Nightly tallies of these targets were then made. Additionally, the ceilometer observations made during the radar survey were an opportunity to document birds and bats flying at low altitude over the radar site. Any bats observed during the ceilometer surveys were recorded.

### 3.2.4 Weather Data

Temperature, relative humidity, and dew point were recorded for the duration of the survey period at 10-minute intervals by data loggers (HOBO Pro v2 U23-001, Onset Computer Corporation) placed on at least one of the bat detector systems. The mean, maximum, and minimum temperature, relative humidity, and dew point were calculated for each night. The data collected by the HOBO datalogger were collected from April 1, 2007 through June 20, 2007. For the purpose of this study and the discussion of bat activity compared with weather data, only weather data collected during the acoustic bat surveys, April 1 to May 31, were analyzed.

## 3.3 RESULTS

### 3.3.1 Detector Call Analysis

Detectors were deployed on March 28 and retrieved on May 31, 2007, for a total survey period of 64 nights. Occasional data gaps occurred when the detectors powered down. During the 64 night sampling period, the met tower high detector (40 m) recorded 32 nights of data and the low detector (20 m) recorded 54 nights of data. Combined, 86 detector-nights of bat echolocation data were recorded during the spring deployment period.

A total of 78 bat call sequences were recorded during the sampling period (Table 3-1). The number of call sequences recorded by *each* detector ranged from 4 (by the high detector) to 74

[4] All field work and any reporting and permitting activities performed prior to October 1, 2007, were conducted as Woodlot Alternatives, Inc. and will be herein referenced as work done by Woodlot. Stantec Consulting Services, Inc. formally merged with Woodlot Alternatives, Inc. on October 1, 2007. Work conducted on or after October 1, 2007 is herein referenced as work done by Stantec.

(by the low detector). The mean detection rate for both detectors was 0.9 calls/detector night. Detection rates at each of the detectors ranged from 0.1 calls/detector-night by the high detector to 1.4 calls/detector-night by the low detector.

**Table 3-1. Summary of bat detector field survey effort and results**

| Location | Dates | # Detector-Nights* | # Recorded Sequences | Detection Rate ** | Maximum # Calls Recorded *** |
|---|---|---|---|---|---|
| Ball Hill Met High | March 28 – May 30 | 32 | 4 | 0.1 | 2 |
| Ball Hill Met Low | March 28 – May 30 | 54 | 74 | 1.4 | 13 |
| *Overall Results* | -- | 86 | 78 | 0.9 | -- |

* Detector-night is a sampling unit during which a single detector is deployed overnight. On nights when two detectors are deployed, the sampling effort equals two detector-nights, etc.

** Number of bat passes recorded per detector-night.

*** Maximum number of bat passes recorded from any **single** detector for a 12-hour sampling period.

The numbers of calls per night detected by both detectors *combined* were generally very low, ranging from 0 to 13 total calls. Nights with peak activity occurred on May 8 and 9, with 13 total calls for each night at the low detector. All activity at both detectors occurred during a three week period from late April to mid May (Figure 3-2).

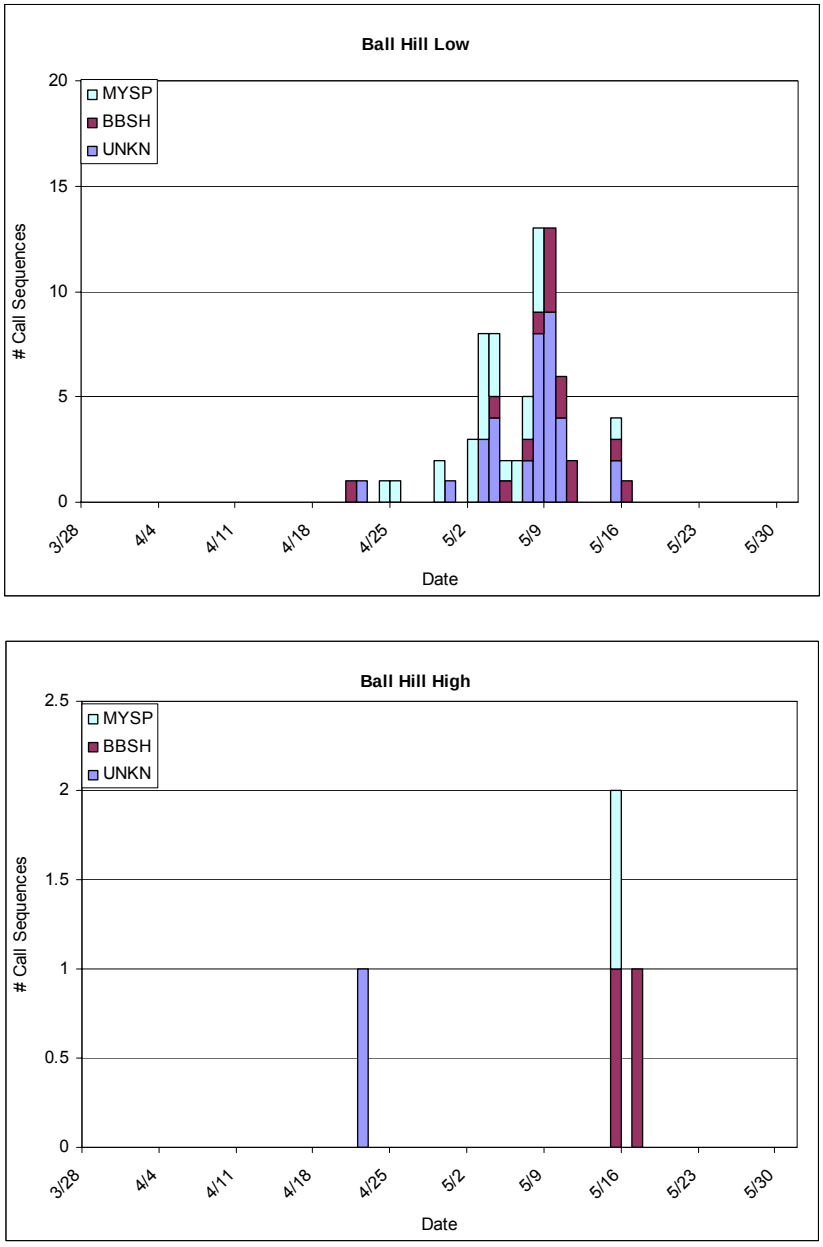



**Figure 3-2.** Total nightly bat call sequence detections

The low detector recorded 74 (95%) of all bat call sequences. The majority of the recorded call sequences (45%) were labeled as unknown due to very short call sequences (less than five pulses) or poor call signature formation (probably due to a bat flying at the edge of the detection zone of the detector or flying away from the microphone) (Table 3-2). Of the calls that were identified to species or guild, those of the MYSP guild were the most common (33% of all call

sequences), followed by the species within the BBSHHB guild (22% of all call sequences). There were no red bat/eastern pipistrelle call sequences identified.

**Table 3-2. Summary of the composition of recorded bat call sequences**

| Detector | Guild | | | | Total |
|---|---|---|---|---|---|
| | Big brown guild | Red bat/ E. pipistrelle | Myotis | Unknown | |
| Ball Hill Met High | 2 | 0 | 1 | 1 | 4 |
| Ball Hill Met Low | 15 | 0 | 25 | 34 | 74 |
| ***Total*** | ***17*** | ***0*** | ***26*** | ***35*** | ***78*** |

Of the 35 call sequences in the unknown group, 32 (91%) were identified simply as high-frequency unknown because there were either less than five pulses or the pulses were too weak. The calls were labled as high-frequency unknown only if the minimum frequency of the call ranged between 30 and 35khz or higher. However, the remaining call sequences were identified as unknown due to the fact that the quality of the call was very poor and was borderline between high and low frequencies (30khz or lower). As for the 24 sequences in the *Myotis* guild, they could only be identified as *Myotis* due to either poor quality or indistinct characteristics of the call sequences. Of the sequences in the big brown guild (BBSHHB), 17 (22%) were either that of the big brown bat or silver-haired bat, no hoary bats were identified (Appendix B, Tables 1-2).

Appendix B provides a series of tables with more specific information on the nightly timing, number, and species composition of recorded bat call sequences. Specifically, Appendix B Tables 1 and 2 provide information on the number of call sequences, by guild and suspected species, recorded at each detector and the weather conditions for that night. Upon request, Stantec can provide a table with the detailed information for all 78 recorded call sequences, including the Analook file name, the night during which the call sequence was recorded, the timing of the recording, and the suspected identity of the species recorded.

Overall, the majority of calls were recorded between 9:00 pm and 10:00 pm, and also between 11:30 am and 2:00 am (Figure 3-3).

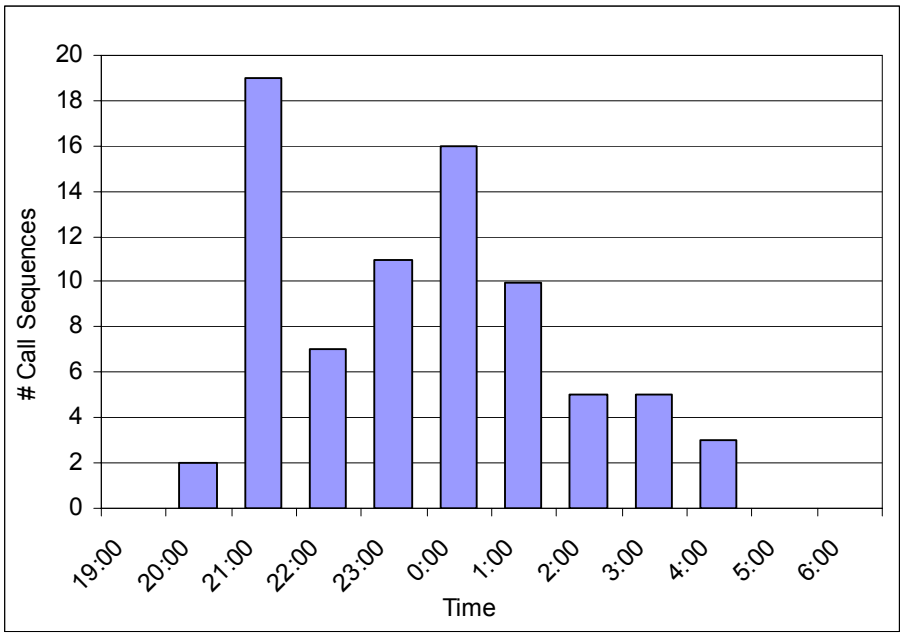


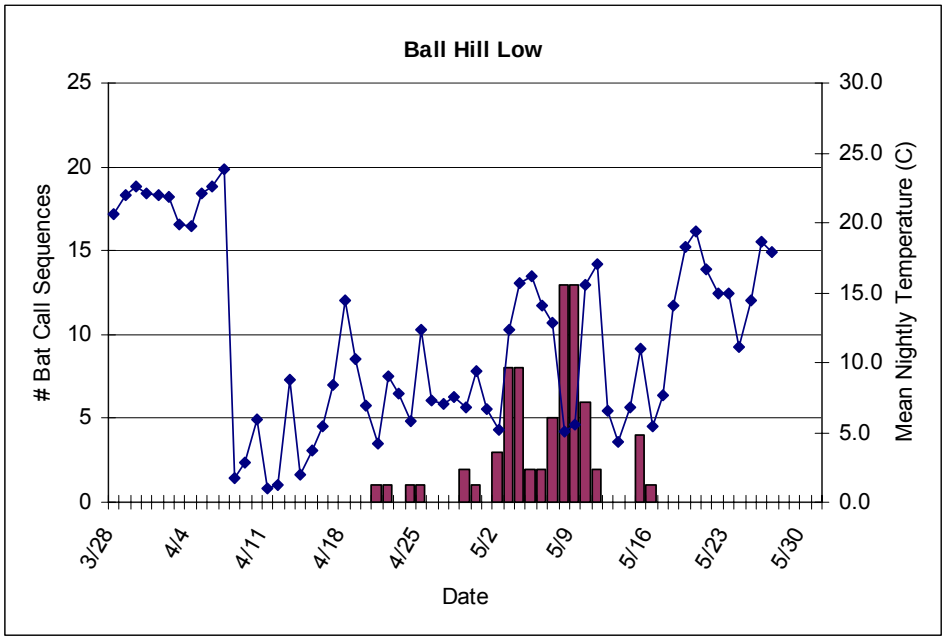

**Figure 3-3.** Hourly distribution of bat call sequences recorded by both detectors

### 3.3.2 Ceilometer and Radar Surveys

During the course of 157 five-minute ceilometer observation periods conducted during radar surveys, thirteen bats were observed. During analysis of the radar survey video data, two percent of target trails were identified as potential bats (Appendix B, Table 5). These observations were generally distributed throughout the sampling period. There was no correlation between the total number of recorded bat call sequences and ceilometer, radar targets, or radar passage rates were observed.

### 3.3.3 Weather Data

Mean nightly temperatures varied between 0.9ºC and 23.9ºC, with an overall mean of 9.6ºC (Figure 3-4). Mean nightly humidity varied from 18.8 percent and 96.9 percent, with an overall mean of 66.8 percent (Figure 3-5). There was a weak positive correlation between mean nightly temperature and bat activity levels and a weak negative correlation between mean nightly relative humidity and bat activity levels at the low detectors (Figure 3-6). Correlations between bat activity and weather variables were not determined for the high detector given low activity levels documented at that detector.



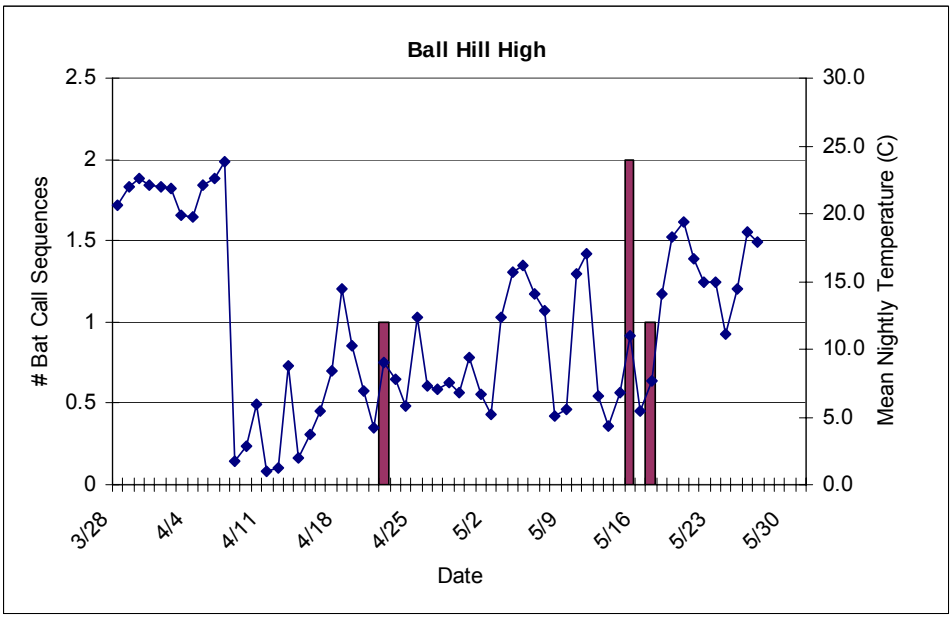
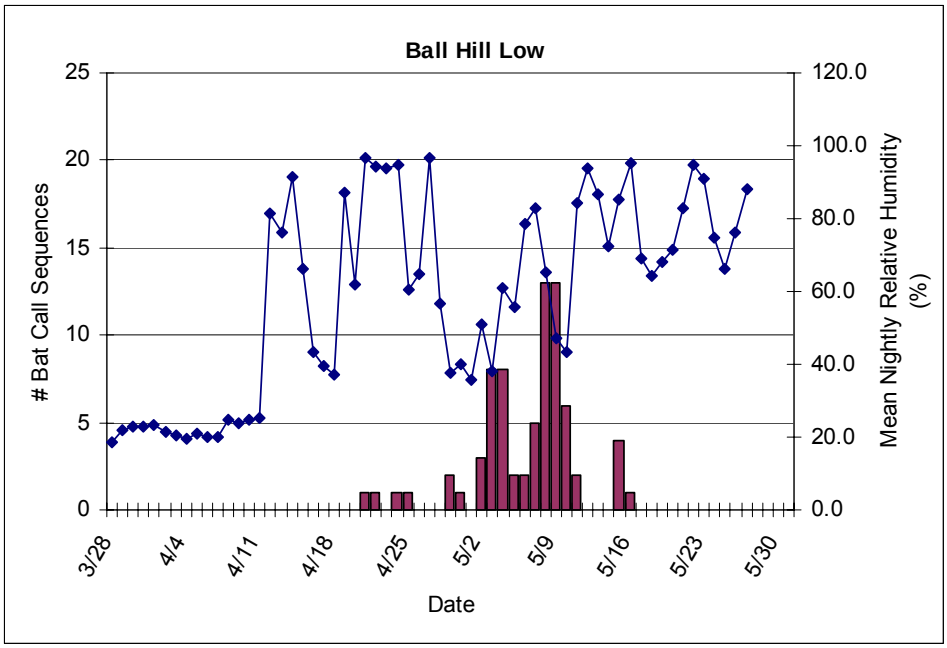




**Figure 3-4.** Nightly mean temperature (Celsius) (blue line) and bat detections



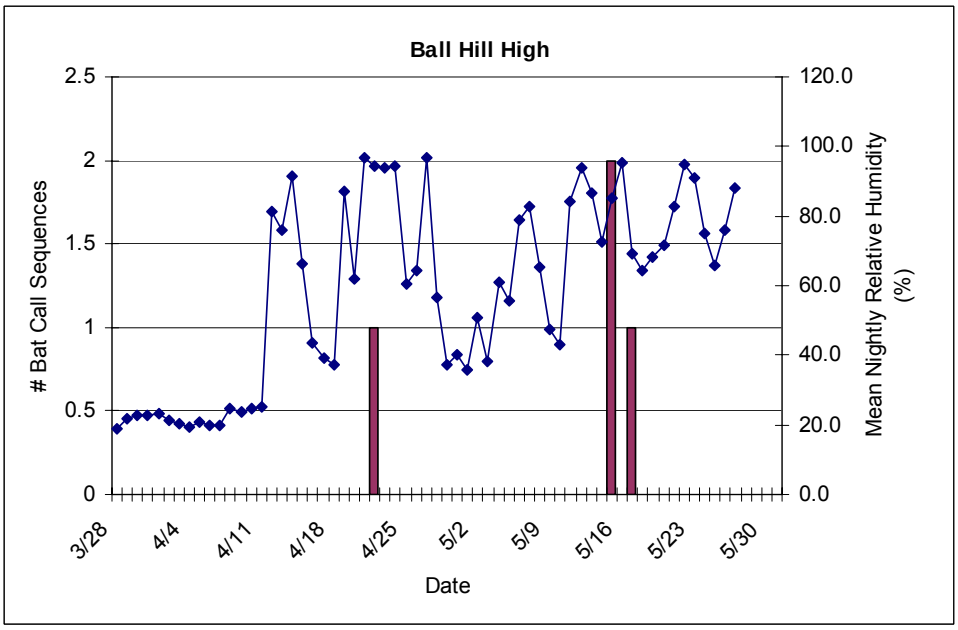




**Figure 3-5.** Nightly mean humidity (blue line) and bat detections

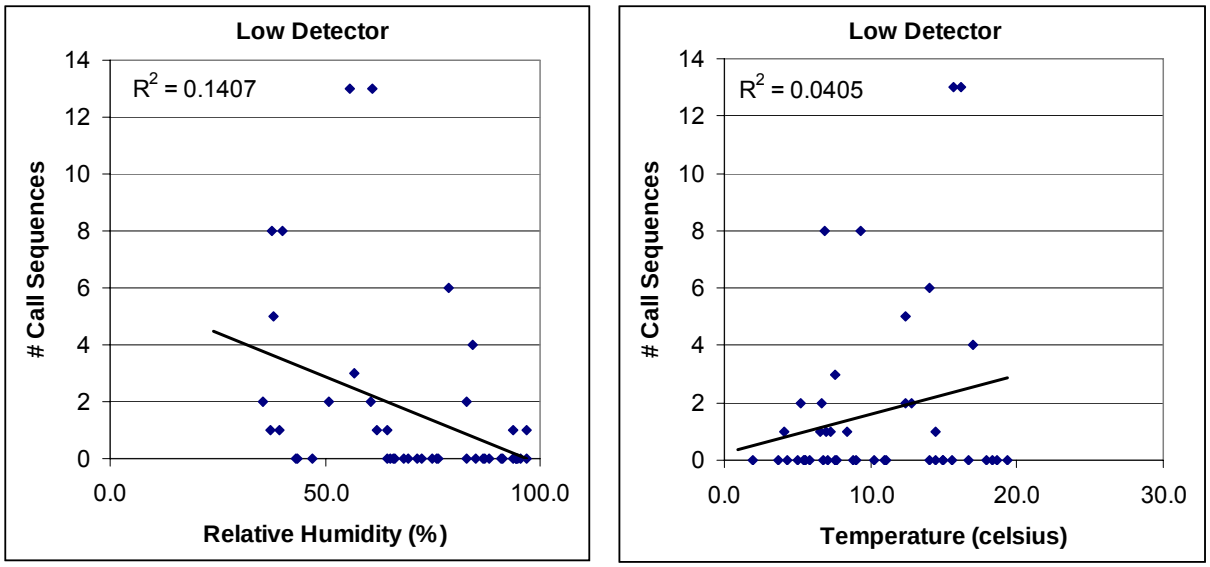



**Figure 3-6.** Relationship between mean nightly relative humidity (left) and bat activity levels and mean nightly temperature (right) and bat activity levels as recorded at the low detector.

## 3.4 DISCUSSION

Spring bat echolocation surveys at Ball Hill documented low levels of bat activity between late March and the end of May. Few call sequences were detected at the site overall, with a small peak in activity documented during mid May. Although the high detector malfunctioned during a considerable portion of the survey period, activity levels documented during the periods when the detector was working properly were very low. The low detector functioned properly for the entire survey period with the exception of a period in early to mid April. The first bat was detected in the project area on the night of April 21, 2007. Overall, the mean detection rate during the spring survey period was 0.9 calls/detector-night, which is similar to results of other spring acoustic bat surveys conducted recently (Appendix B, Table 3).

Bat calls were identified to guild within this report, although calls were provisionally categorized by species when possible during analysis. Certain species, such as the eastern red bat and hoary bat have easily identifiable calls, whereas other species, such as the big brown bat and silver-haired bat are difficult to distinguish acoustically. Similarly, certain members of the *Myotis* genus, such as the little brown bat, are far more common and have slightly more distinguishable calls than other species. The following paragraphs discuss each guild separately and address likely species composition of recorded bats within each guild.

The MYSP guild includes all four species of *Myotis* potentially occurring in the project area, including the little brown bat, northern long-eared bat, eastern small-footed bat, and the federally endangered Indiana bat. Of these species, the little brown bat and northern long-eared bat are by far the most common and have calls that tend to be slightly more distinguishable using the Anabat system. A total of 26 call sequences were identified as belonging to the *Myotis* guild. Recorded call sequences consisted primarily of search-phase

calls and were of moderate to low quality overall. Calls were not identified to species, although were likely those of either little brown bats or northern long-eared bats, the most common species within this guild.

The BBSHHB guild includes the big brown bat, silver-haired bat, and hoary bat. Within this grouping, the hoary bat has easily distinguishable calls characterized by highly variable minimum frequencies often extending below 20 kHz and a hooked profile similar to the eastern red bat. Calls of silver-haired bats and big brown bats are occasionally distinguishable, but often overlap in range and can be difficult to distinguish, especially when comparing short duration calls typical of those recorded during passive monitoring. Of the 17 calls classified as BBSHHB, 15 (88%) of the calls were recorded by the low (20 m) detector. Thirteen (86%) of the 15 calls recorded could only be identified as big brown/silver-haired bats because of insufficient call quality. However 2 (13%) of the 15 calls were identified as big brown bats. Even though the high detector only recorded 4 (5% of the total), two of them were identified to the BBSHHB guild: one was identified as a silver-haired (LANO) bat and the other was identified as either a big brown or silver-haired bat.

Of the 78 total calls recorded in the project area, 35 (45%) were classified as UNKN, due to their short duration and or poor quality. However, these calls were identified as “high frequency” or “low frequency”. For the purposes of this analysis, “high frequency” call fragments were defined as having a minimum frequency above 30 kHz, and “low frequency” calls were defined as having a minimum frequency below 30 kHz. High frequency unknown calls, (HFUN’s) were the most common for unknown recorded call sequences. Although call sequences identified as HFUN were generally very short and/or of poor quality, many of these were likely fragments of MYSP calls. A small number of the HFUN calls were likely from bats within the eastern red bat-eastern pipistrelle (RBEP) guild. Although no call sequences were identified to this guild at the high or low detector, several short call fragments appeared similar to calls of these species, which are likely present in the project area.

Differences in detection rates among guilds at the various detectors deployed in the project area may reflect varying vertical distribution and habitat preferences of bat species (Hayes 2000). While detector malfunction likely contributed to the low number of calls detected at the high detector during spring surveys, very few call sequences were recorded by the high detector, even when working properly. Recent research (Arnett *et al*. 2006) found that small *Myotis* species were more frequently recorded at lower heights while larger species were typically recorded more often at higher heights. In forested habitat, both large and small species were recorded in greater numbers at a medium height of 22 m, rather than at 1.5 m or 44 m.

Bat activity patterns during migration seem to be related to weather conditions based on mortality studies and acoustic surveys. Acoustic surveys have documented a decrease in bat activity rates as wind speed increase and temperatures decrease, and bat activity has been shown to correlate negatively to low nightly mean temperatures (Hayes 1997, Reynolds 2006). Similarly, weather factors appeared related to bat collision mortality rates documented at two facilities in the southeastern United States, with mortality rates negatively correlated with both wind speed and relative humidity, and positively correlated to barometric pressure (Arnett 2005).

These patterns suggest that bats are more likely to migrate on nights with low wind speeds (less than 4-6 m/s) and generally favorable weather (warm temperatures, low humidity, high barometric pressure). Although the spring acoustic data from Ball Hill represent a small sample size, bat activity levels appeared to increase with increasing nightly temperature and decrease with increasing nightly relative humidity.

Bat activity also appeared to vary by time of night, with peaks in activity occurring three and six hours past sunset. This bimodal nighttime distribution of bat activity documented at both met towers seems to be a consistent behavioral trend in a number of species (Hayes 1997). Anthony *et al*. (1981) documented that bats appear to leave roosting sites at dusk to forage for a given period, return to their roosts during the middle portion of the night, then forage again later in the evening, closer to dawn.

Results of acoustic surveys must be interpreted with caution. Considerable room for error exists in identification of bats based upon acoustic calls alone, especially if a site or regionally specific library of recorded reference calls is not available. Also, detection rates are not necessarily correlated with the actual numbers of bats in an area, because it is not possible to differentiate among individual bats (Hayes 2000).

## 3.5 CONCLUSIONS

Acoustic bat surveys during spring 2007 documented very low rates of bat activity. Temperatures were generally cold during the April-May survey period, which likely contributed to the low rates of bat activity. Although the high detector malfunctioned for considerable portions of the survey period, activity levels were greater at the low detector overall and during nights when both detectors were functioning properly. Identification of calls suggested that members of the genus *Myotis* are among the most common species at the site during the spring period. While calls within the *Myotis* genus were not identifiable to species, the most common species within this genus are the little brown bat and the northern long-eared bat. Most calls could not be identified properly, due to poor call quality or short duration of calls. Comparisons of bat activity levels and weather variables suggest that bats were more active on warmer, less humid nights, which is consistent with results of other bat acoustic surveys and limited post-construction mortality surveys. While bat activity levels were generally low during spring, bats were detected most frequently between early and mid May.

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# Appendix A

Radar survey results

**Appendix A Table 1.** Survey dates, results, level of effort, and weather - Spring 2007

| Date | Mean Passage Rate | Mean Flight Direction | Mean Flight Height (m) | % Below 120 m | Hours of Survey | Mean Temp (F) | Mean Wind Speed (mph) | Mean Wind Direction (from) |
|---|---|---|---|---|---|---|---|---|
| 4/17/2007 | 22 | 101.094 | 177 | 64% | 11 | 40 | 11 | NNW |
| 4/18/2007 | 181 | 225.776 | 758 | 1% | 11 | 40 | 1 | NNE |
| 4/19/2007 | 220 | 6.435 | 378 | 13% | 9 | 42 | 3 | NE |
| 4/20/2007 | 374 | 36.701 | 604 | 5% | 11 | 46 | 3 | WSW |
| 4/21/2007 | 377 | 16.568 | 862 | 1% | 10 | 50 | 4 | WSW |
| 4/22/2007 | 557 | 0.687 | 705 | 2% | 11 | 54 | 4 | SW |
| 4/23/2007 | 266 | 80.296 | 432 | 8% | 7 | 66 | 13 | SW |
| 4/24/2007 | 250 | 320.164 | 509 | 4% | 10 | 47 | 5 | NNW |
| 4/25/2007 | 53 | 310.419 | 391 | 7% | 11 | 45 | 2 | NE |
| 4/27/2007 | 84 | 71.774 | 229 | 40% | 10 | 56 | 17 | SW |
| 4/28/2007 | 284 | 47.465 | 265 | 17% | 10 | 48 | 16 | WSW |
| 4/29/2007 | 363 | 13.316 | 397 | 5% | 9 | 50 | 7 | SW |
| 4/30/2007 | 319 | 27.618 | 439 | 6% | 7 | 57 | 14 | WSW |
| 5/1/2007 | 120 | 202.615 | 449 | 4% | 10 | 50 | 2 | NE |
| 5/2/2007 | 459 | 311.963 | 635 | 5% | 8 | 48 | 4 | NNE |
| 5/3/2007 | 415 | 337.876 | 841 | 2% | 10 | 48 | 5 | NE |
| 5/4/2007 | 355 | 341.054 | 917 | 1% | 10 | 50 | 6 | ENE |
| 5/5/2007 | 365 | 107.286 | 365 | 17% | 5 | 54 | 8 | NE |
| 5/7/2007 | 563 | 4.096 | 620 | 0% | 10 | 48 | 9 | NE |
| 5/8/2007 | 1190 | 20.363 | 540 | 2% | 10 | 65 | 13 | SW |
| 5/9/2007 | 952 | 4.233 | 669 | 2% | 9 | 67 | 3 | NW |
| 5/10/2007 | 886 | 34.862 | 421 | 8% | 9 | 60 | 8 | WSW |
| 5/11/2007 | 458 | 96.354 | 703 | 1% | 10 | 64 | 2 | W |
| 5/12/2007 | 143 | 69.215 | 330 | 27% | 10 | 49 | 4 | NE |
| 5/14/2007 | 707 | 2.047 | 561 | 0% | 10 | 52 | 1 | SSW |
| 5/15/2007 | 553 | 4.276 | 549 | 2% | 8 | 72 | 20 | SW |
| 5/16/2007 | 146 | 87.587 | 246 | 31% | 10 | 56 | 11 | WSW |
| 5/17/2007 | 192 | 306.843 | 307 | 16% | 9 | 49 | 11 | NW |
| 5/18/2007 | 353 | 34.428 | 282 | 13% | 9 | 46 | 4 | NNW |
| 5/19/2007 | 277 | 27.238 | 295 | 14% | 5 | 53 | 9 | SW |
| 5/21/2007 | 466 | 339.533 | 559 | 1% | 10 | 48 | 4 | N |
| 5/22/2007 | 419 | 357.69 | 584 | 2% | 8 | 58 | 4 | ESE |
| 5/23/2007 | 598 | 338.294 | 561 | 1% | 10 | 66 | 2 | N |
| 5/24/2007 | 737 | 9.864 | 502 | 2% | 9 | 74 | 17 | SW |
| 5/25/2007 | 333 | 60.388 | 475 | 3% | 10 | 73 | 8 | SW |
| 5/26/2007 | 332 | 356.306 | 393 | 3% | 10 | 58 | 4 | ENE |
| 5/27/2007 | 362 | 18.068 | 385 | 3% | 9 | 68 | 5 | SW |
| 5/28/2007 | 520 | 23.199 | 431 | 9% | 9 | 60 | 10 | SW |
| 5/29/2007 | 618 | 324.272 | 478 | 4% | 9 | 60 | 1 | N |
| 5/30/2007 | 722 | 23.365 | 494 | 1% | 9 | 67 | 5 | WSW |

**Appendix A Table 2.** Summary of passage rates by hour, night, and for entire season.

| Night of | Passage Rate (targets/km/hr) by hour after sunset | | | | | | | | | | | Entire Night | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Mean | Median | Stdev | SE |
| 4/17/2007 | 7 | 43 | 36 | 75 | 43 | 5 | 0 | 4 | 0 | 9 | 21 | 22 | 9 | 24 | 7 |
| 4/18/2007 | 64 | 39 | 91 | 129 | 279 | 257 | 611 | 200 | 150 | 91 | 75 | 181 | 129 | 163 | 49 |
| 4/19/2007 | 157 | 186 | 287 | 279 | 254 | 219 | 243 | 186 | 171 | -- | -- | 220 | 219 | 48 | 16 |
| 4/20/2007 | 279 | 257 | 407 | 454 | 471 | 434 | 407 | 386 | 350 | 343 | 321 | 374 | 386 | 70 | 21 |
| 4/21/2007 | 331 | 317 | 471 | 479 | 332 | 321 | -- | 536 | 421 | 357 | 207 | 377 | 345 | 98 | 30 |
| 4/22/2007 | 332 | 354 | 471 | 527 | 643 | 857 | 911 | 750 | 779 | 270 | 236 | 557 | 527 | 244 | 74 |
| 4/23/2007 | 241 | 219 | 445 | 327 | 296 | 236 | 101 | -- | -- | -- | -- | 266 | 241 | 106 | 40 |
| 4/24/2007 | 182 | 286 | 257 | 264 | 354 | 300 | 343 | 214 | 113 | 189 | -- | 250 | 261 | 76 | 24 |
| 4/25/2007 | 86 | 64 | 71 | 64 | 90 | 57 | 55 | 0 | 13 | 43 | 43 | 53 | 57 | 28 | 8 |
| 4/27/2007 | 243 | 118 | 99 | 157 | 107 | 43 | 14 | 0 | 14 | 43 | -- | 84 | 71 | 76 | 24 |
| 4/28/2007 | 129 | 198 | 321 | 410 | 380 | 436 | 371 | 300 | 186 | 107 | -- | 284 | 311 | 120 | 38 |
| 4/29/2007 | 144 | -- | 600 | 536 | 568 | 230 | 343 | 300 | 437 | 107 | -- | 363 | 343 | 183 | 58 |
| 4/30/2007 | 229 | 264 | 386 | 393 | 339 | 303 | 318 | -- | -- | -- | -- | 319 | 318 | 60 | 23 |
| 5/1/2007 | -- | 171 | 161 | 227 | 145 | 111 | 94 | 5 | 32 | 136 | -- | 120 | 136 | 69 | 22 |
| 5/2/2007 | 332 | 420 | 407 | 514 | 527 | 413 | 545 | 510 | -- | -- | -- | 459 | 465 | 76 | 27 |
| 5/3/2007 | 71 | 507 | 400 | 407 | 457 | 475 | 482 | 573 | 530 | 244 | -- | 415 | 466 | 151 | 48 |
| 5/4/2007 | 129 | 373 | 443 | 446 | 407 | 381 | 368 | 400 | 279 | 321 | -- | 355 | 377 | 94 | 30 |
| 5/5/2007 | 119 | 450 | 455 | 394 | 407 | -- | -- | -- | -- | -- | -- | 365 | 407 | 140 | 63 |
| 5/7/2007 | 686 | 668 | 789 | 700 | 589 | 621 | 464 | 488 | 463 | 164 | -- | 563 | 605 | 178 | 56 |
| 5/8/2007 | 1071 | 973 | 1307 | 1214 | 1425 | 1393 | 1200 | 1431 | 1414 | 471 | -- | 1190 | 1261 | 298 | 94 |
| 5/9/2007 | 651 | 891 | 900 | 1109 | 1269 | 1361 | 1275 | 1007 | 107 | -- | -- | 952 | 1007 | 389 | 130 |
| 5/10/2007 | 150 | 714 | 1021 | 1221 | 1022 | 1130 | 1000 | 804 | 911 | -- | -- | 886 | 1000 | 316 | 105 |
| 5/11/2007 | 392 | 554 | 486 | 441 | 686 | 579 | 327 | 407 | 343 | 364 | -- | 458 | 424 | 117 | 115 |
| 5/12/2007 | 86 | 193 | 209 | 204 | 204 | 125 | 96 | 86 | 99 | 129 | -- | 143 | 127 | 53 | 17 |
| 5/14/2007 | 814 | 675 | 643 | 621 | 836 | 680 | 868 | 849 | 764 | 321 | -- | 707 | 722 | 163 | 52 |
| 5/15/2007 | 114 | 536 | 857 | 639 | 536 | 607 | 574 | 564 | | -- | -- | 553 | 569 | 206 | 73 |
| 5/16/2007 | 73 | 171 | 176 | 236 | 145 | 236 | 150 | 29 | 180 | 64 | -- | 146 | 161 | 70 | 22 |
| 5/17/2007 | 214 | 270 | 257 | 241 | 209 | 201 | 157 | 116 | 64 | -- | -- | 192 | 209 | 68 | 23 |
| 5/18/2007 | 102 | 471 | 371 | 422 | 454 | 500 | 414 | 250 | 193 | -- | -- | 353 | 414 | 139 | 46 |
| 5/19/2007 | 83 | 409 | 512 | 298 | 86 | -- | -- | -- | -- | -- | -- | 277 | 298 | 192 | 86 |
| 5/21/2007 | 150 | 407 | 407 | 553 | 703 | 716 | 771 | 550 | 293 | 107 | -- | 466 | 479 | 234 | 74 |
| 5/22/2007 | 21 | -- | -- | 804 | 741 | 782 | 796 | 37 | 918 | 657 | -- | 595 | 762 | 356 | 126 |
| 5/23/2007 | 707 | 734 | 825 | 720 | 686 | 595 | 579 | 561 | 336 | 236 | -- | 598 | 640 | 184 | 58 |
| 5/24/2007 | 739 | 893 | 671 | 943 | 838 | 750 | 707 | 713 | 382 | | -- | 737 | 739 | 162 | 54 |
| 5/25/2007 | 321 | 489 | 471 | 317 | 396 | 476 | 402 | 246 | 107 | 102 | -- | 333 | 359 | 143 | 45 |
| 5/26/2007 | 143 | 407 | 522 | 468 | 300 | 407 | 386 | 436 | 155 | 96 | -- | 332 | 396 | 150 | 48 |
| 5/27/2007 | 274 | 496 | 466 | 439 | 424 | 364 | 343 | 380 | 71 | -- | -- | 362 | 380 | 128 | 43 |
| 5/28/2007 | 214 | 754 | 739 | 664 | 557 | 552 | 600 | 525 | 75 | -- | -- | 520 | 557 | 230 | 77 |
| 5/29/2007 | 664 | 781 | 681 | 596 | 736 | 690 | 657 | 586 | 176 | -- | -- | 618 | 664 | 177 | 59 |
| 5/30/2007 | 707 | 771 | 1029 | 951 | 879 | 763 | 568 | 621 | 211 | -- | -- | 722 | 763 | 243 | 81 |
| **Entire Season** | **294** | **435** | **491** | **497** | **495** | **490** | **474** | **430** | **316** | **207** | **151** | **419** | **391** | **252** | **40** |

| **Appendix A Table 3.** Mean Nightly Flight Direction | | |
|---|---|---|
| **Night of** | **Mean Flight Direction** | **Circular Stdev** |
| 4/17/2007 | 101.094° | 123.353° |
| 4/18/2007 | 225.776° | 78.945° |
| 4/19/2007 | 6.435° | 60.786° |
| 4/20/2007 | 36.701° | 38.358° |
| 4/21/2007 | 16.568° | 50.622° |
| 4/22/2007 | 0.687° | 42.455° |
| 4/23/2007 | 80.296° | 67.654° |
| 4/24/2007 | 320.164° | 85.466° |
| 4/25/2007 | 310.419° | 86.891° |
| 4/27/2007 | 71.774° | 50.585° |
| 4/28/2007 | 47.465° | 46.766° |
| 4/29/2007 | 13.316° | 43.401° |
| 4/30/2007 | 27.618° | 87.311° |
| 5/1/2007 | 202.615° | 97.178° |
| 5/2/2007 | 311.963° | 81.579° |
| 5/3/2007 | 337.876° | 52.622° |
| 5/4/2007 | 341.054° | 56.015° |
| 5/5/2007 | 107.286° | 139.165° |
| 5/7/2007 | 4.096° | 63.305° |
| 5/8/2007 | 20.363° | 69.88° |
| 5/9/2007 | 4.233° | 97.9° |
| 5/10/2007 | 34.862° | 49.45° |
| 5/11/2007 | 96.354° | 133.276° |
| 5/12/2007 | 69.215° | 120.439° |
| 5/14/2007 | 2.047° | 45.691° |
| 5/15/2007 | 4.276° | 69.34° |
| 5/16/2007 | 87.587° | 95.927° |
| 5/17/2007 | 306.843° | 94.199° |
| 5/18/2007 | 34.428° | 49.249° |
| 5/19/2007 | 27.238° | 38.258° |
| 5/21/2007 | 339.533° | 48.412° |
| 5/22/2007 | 357.69° | 38.118° |
| 5/23/2007 | 338.294° | 56.6° |
| 5/24/2007 | 9.864° | 51.286° |
| 5/25/2007 | 60.388° | 72.072° |
| 5/26/2007 | 356.306° | 48.07° |
| 5/27/2007 | 18.068° | 55.755° |
| 5/28/2007 | 23.199° | 77.163° |
| 5/29/2007 | 324.272° | 64.571° |
| 5/30/2007 | 23.365° | 48.915° |
| **Entire Season** | 9.824° | 70.121° |

**Appendix A Table 4.** Summary of flight heights by hour, night, and for entire season.

| Night of | Mean Flight Height (m) by hour after sunset | | | | | | | | | | | Entire Night | | | | % of targets below 120 meters |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Mean | Median | STDV | SE | |
| 4/17/2007 | 362 | 69 | 259 | 151 | -- | -- | -- | -- | -- | 44 | -- | 177 | 151 | 133 | 60 | 64% |
| 4/18/2007 | 380 | 778 | 711 | 775 | 985 | 604 | 794 | 817 | 897 | 850 | 744 | 758 | 778 | 159 | 48 | 1% |
| 4/19/2007 | 337 | 526 | 408 | 368 | 302 | 316 | 382 | 396 | 362 | -- | -- | 378 | 368 | 66 | 22 | 13% |
| 4/20/2007 | 543 | 856 | 670 | 655 | 597 | 577 | 579 | 599 | 641 | 538 | 384 | 604 | 597 | 114 | 34 | 5% |
| 4/21/2007 | 351 | 942 | 928 | 947 | 1058 | 1024 | 957 | 882 | 722 | 808 | -- | 862 | 935 | 204 | 65 | 1% |
| 4/22/2007 | 593 | 812 | 839 | 802 | 826 | 816 | 784 | 619 | 628 | 589 | 446 | 705 | 784 | 134 | 40 | 2% |
| 4/23/2007 | 549 | 422 | 418 | 381 | 551 | 395 | 308 | -- | -- | -- | -- | 432 | 418 | 89 | 34 | 8% |
| 4/24/2007 | 201 | 443 | 407 | 553 | 690 | 746 | 655 | 512 | 541 | 343 | -- | 509 | 526 | 167 | 53 | 4% |
| 4/25/2007 | -- | 333 | 322 | 411 | 500 | 360 | 335 | 216 | 415 | 627 | -- | 391 | 360 | 118 | 39 | 7% |
| 4/27/2007 | 213 | 281 | 272 | 216 | 198 | 308 | 117 | -- | -- | -- | -- | 229 | 216 | 64 | 24 | 40% |
| 4/28/2007 | 259 | 286 | 334 | 349 | 351 | 299 | 263 | 217 | 127 | 166 | -- | 265 | 274 | 76 | 24 | 17% |
| 4/29/2007 | 433 | 548 | 474 | 463 | 392 | 435 | 369 | 320 | 317 | 222 | -- | 397 | 412 | 94 | 30 | 5% |
| 4/30/2007 | 247 | 350 | 352 | 387 | 608 | 582 | 549 | -- | -- | -- | -- | 439 | 387 | 139 | 53 | 6% |
| 5/1/2007 | -- | 496 | 452 | 419 | 494 | 511 | 508 | 433 | 444 | 283 | -- | 449 | 452 | 71 | 24 | 4% |
| 5/2/2007 | 167 | -- | -- | 645 | 660 | 764 | 702 | 732 | 773 | -- | -- | 635 | 702 | 212 | 80 | 5% |
| 5/3/2007 | 632 | 732 | 848 | 894 | 852 | 789 | 870 | 907 | 902 | 981 | -- | 841 | 861 | 100 | 32 | 2% |
| 5/4/2007 | 535 | 963 | ### | ### | 975 | 1015 | 966 | 975 | 892 | 769 | -- | 917 | 971 | 157 | 49 | 1% |
| 5/5/2007 | 284 | 444 | 378 | 474 | 244 | -- | -- | -- | -- | -- | -- | 365 | 378 | 99 | 44 | 17% |
| 5/7/2007 | 525 | 622 | 561 | 682 | 656 | 648 | 641 | 644 | 579 | 649 | -- | 620 | 642 | 49 | 16 | 0% |
| 5/8/2007 | 397 | 573 | 581 | 586 | 564 | -- | 561 | 544 | 522 | 535 | -- | 540 | 561 | 58 | 19 | 2% |
| 5/9/2007 | 550 | 743 | 725 | 684 | 626 | 629 | 593 | 701 | 767 | -- | -- | 669 | 684 | 73 | 24 | 2% |
| 5/10/2007 | 320 | 596 | 567 | 532 | 447 | 422 | 339 | 306 | 261 | -- | -- | 421 | 422 | 123 | 41 | 8% |
| 5/11/2007 | 292 | 733 | 883 | 954 | 824 | -- | 786 | 697 | 566 | 590 | -- | 703 | 733 | 199 | 66 | 1% |
| 5/12/2007 | 226 | 808 | 587 | 403 | 250 | 177 | 264 | 234 | 157 | 191 | -- | 330 | 242 | 212 | 67 | 27% |
| 5/14/2007 | 558 | 633 | 649 | 632 | 616 | 525 | 471 | 465 | 489 | 569 | -- | 561 | 564 | 71 | 22 | 0% |
| 5/15/2007 | 530 | 664 | 612 | 531 | 561 | 410 | 547 | 539 | -- | -- | -- | 549 | 543 | 73 | 26 | 2% |
| 5/16/2007 | 374 | 328 | 252 | 113 | 218 | 217 | 391 | -- | 78 | -- | -- | 246 | 235 | 114 | 40 | 31% |
| 5/17/2007 | 260 | 392 | 369 | 376 | 335 | 319 | 238 | 372 | 100 | -- | -- | 307 | 335 | 94 | 31 | 16% |
| 5/18/2007 | 366 | 394 | 341 | 273 | 250 | 211 | 173 | 283 | 247 | -- | -- | 282 | 273 | 73 | 24 | 13% |
| 5/19/2007 | 337 | 308 | 233 | 302 | -- | -- | -- | -- | -- | -- | -- | 295 | 305 | 44 | 22 | 14% |
| 5/21/2007 | 457 | 735 | 681 | 618 | 555 | 530 | 470 | 511 | 476 | -- | -- | 559 | 530 | 98 | 33 | 1% |
| 5/22/2007 | 432 | 713 | 793 | 722 | 655 | 644 | 523 | 483 | 398 | 472 | -- | 584 | 584 | 138 | 44 | 2% |
| 5/23/2007 | 536 | 760 | 670 | 537 | -- | 496 | 471 | 484 | 535 | -- | -- | 561 | 584 | 101 | 36 | 1% |
| 5/24/2007 | 423 | 653 | 636 | 579 | 481 | 454 | 453 | 413 | 425 | -- | -- | 502 | 454 | 95 | 32 | 2% |
| 5/25/2007 | 324 | 569 | 499 | 395 | 461 | 534 | 455 | 509 | 526 | -- | -- | 475 | 499 | 76 | 25 | 3% |
| 5/26/2007 | 337 | 399 | 414 | 408 | 403 | 393 | 396 | 398 | 392 | -- | -- | 393 | 398 | 22 | 7 | 3% |
| 5/27/2007 | 353 | 494 | 394 | 358 | 327 | 348 | 277 | 508 | 404 | -- | -- | 385 | 358 | 75 | 25 | 3% |
| 5/28/2007 | 303 | 478 | 404 | 459 | 512 | 465 | 425 | 373 | 459 | -- | -- | 431 | 459 | 63 | 21 | 9% |
| 5/29/2007 | 430 | 578 | 519 | 500 | 491 | 505 | 415 | 391 | 471 | -- | -- | 478 | 491 | 58 | 19 | 4% |
| 5/30/2007 | 531 | 577 | 576 | 531 | 471 | 462 | 439 | 393 | 465 | -- | -- | 494 | 471 | 63 | 21 | 1% |
| **Entire Season** | **393** | **565** | **541** | **524** | **540** | **512** | **499** | **511** | **484** | **512** | **525** | **493** | **465** | **177** | **28** | **3%** |

**Appendix A Table 5.** Results of ceilometer and moonwatching observations with nightly mean weather

| Night of | Radar Results | | | | Ceilometer Results | | | Mean Nightly Weather Conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Possible Bird Targets | Possible Bat Targets | Likely Insects | # of Obs Periods | Birds | Bats | Insects | Temp | Wind Speed (mph) | Wind Direction (from) |
| 4/17/2007 | 84% | 19% | 0% | NA | NA | NA | NA | 40 | 11 | NNW |
| 4/18/2007 | 95% | 5% | 0% | NA | NA | NA | NA | 40 | 1 | NNE |
| 4/19/2007 | 100% | 0% | 0% | NA | NA | NA | NA | 42 | 3 | NE |
| 4/20/2007 | 99% | 1% | 5% | NA | NA | NA | NA | 46 | 3 | WSW |
| 4/21/2007 | 91% | 9% | 1% | NA | NA | NA | NA | 50 | 4 | WSW |
| 4/22/2007 | 99% | 1% | 0% | NA | NA | NA | NA | 54 | 4 | SW |
| 4/23/2007 | 87% | 15% | 0% | NA | NA | NA | NA | 66 | 13 | SW |
| 4/24/2007 | 93% | 7% | 0% | NA | NA | NA | NA | 47 | 5 | NNW |
| 4/25/2007 | 74% | 35% | 0% | NA | NA | NA | NA | 45 | 2 | NE |
| 4/27/2007 | 94% | 6% | 0% | NA | NA | NA | NA | 56 | 17 | SW |
| 4/28/2007 | 6% | 19% | 0% | NA | NA | NA | NA | 48 | 16 | WSW |
| 4/29/2007 | 99% | 1% | 0% | NA | NA | NA | NA | 50 | 7 | SW |
| 4/30/2007 | 97% | 3% | 0% | NA | NA | NA | NA | 57 | 14 | WSW |
| 5/1/2007 | 95% | 5% | 0% | NA | NA | NA | NA | 50 | 2 | NE |
| 5/2/2007 | 98% | 2% | 0% | NA | NA | NA | NA | 48 | 4 | NNE |
| 5/3/2007 | 98% | 2% | 0% | NA | NA | NA | NA | 48 | 5 | NE |
| 5/4/2007 | 92% | 9% | 0% | NA | NA | NA | NA | 50 | 6 | ENE |
| 5/5/2007 | 95% | 6% | 1% | NA | NA | NA | NA | 54 | 8 | NE |
| 5/7/2007 | 95% | 5% | 7% | 8 | 0 | 0 | 0 | 48 | 9 | NE |
| 5/8/2007 | 95% | 5% | 6% | 8 | 0 | 0 | 7 | 65 | 13 | SW |
| 5/9/2007 | 97% | 3% | 3% | 8 | 0 | 0 | 19 | 67 | 3 | NW |
| 5/10/2007 | 100% | 0% | 0% | 8 | 0 | 0 | 12 | 60 | 8 | WSW |
| 5/11/2007 | 98% | 2% | 0% | 8 | 0 | 0 | 3 | 64 | 2 | W |
| 5/12/2007 | 99% | 1% | 0% | 9 | 1 | 0 | 3 | 49 | 4 | NE |
| 5/14/2007 | 100% | 0% | 0% | 8 | 1 | 0 | 1 | 52 | 1 | SSW |
| 5/15/2007 | 100% | 0% | 0% | 6 | 0 | 1 | 22 | 72 | 20 | SW |
| 5/16/2007 | 97% | 3% | 0% | 7 | 0 | 0 | 0 | 56 | 11 | WSW |
| 5/17/2007 | 100% | 0% | 0% | 7 | 0 | 1 | 2 | 49 | 11 | NW |
| 5/18/2007 | 99% | 1% | 0% | 7 | 0 | 1 | 5 | 46 | 4 | NNW |
| 5/19/2007 | 100% | 0% | 0% | 3 | 0 | 0 | 0 | 53 | 9 | SW |
| 5/21/2007 | 99% | 1% | 0% | 7 | 0 | 0 | 1 | 48 | 4 | N |
| 5/22/2007 | 100% | 0% | 0% | 7 | 0 | 0 | 0 | 58 | 4 | ESE |
| 5/23/2007 | 100% | 0% | 0% | 7 | 0 | 0 | 2 | 66 | 2 | N |
| 5/24/2007 | 100% | 0% | 0% | 7 | 0 | 1 | 4 | 74 | 17 | SW |
| 5/25/2007 | 100% | 0% | 0% | 7 | 0 | 1 | 16 | 73 | 8 | SW |
| 5/26/2007 | 100% | 0% | 0% | 7 | 0 | 2 | 6 | 58 | 4 | ENE |
| 5/27/2007 | 100% | 0% | 0% | 7 | 0 | 0 | 0 | 68 | 5 | SW |
| 5/28/2007 | 100% | 0% | 0% | 7 | 0 | 6 | 4 | 60 | 10 | SW |
| 5/29/2007 | 100% | 0% | 0% | 7 | 0 | 0 | 0 | 60 | 1 | N |
| 5/30/2007 | 100% | 0% | 0% | 7 | 2 | 0 | 0 | 67 | 5 | WSW |
| **Entire Season** | 96% | 2% | 1% | **157** | **4** | **13** | **107** | **NA** | **NA** | **NA** |

**Appendix A Table 6**. Summary of available spring avian radar survey results

| Project Site | No. of Survey Nights | No. of Survey Hours | Landscape | Average Passage Rate (t/km/hr) | Range in Nightly Passage Rates | Average Flight Direction | Average Flight Height (m) | (Turbine Height) % Targets Below Turbine Height | Citation |
|---|---|---|---|---|---|---|---|---|---|
| **Spring 2003** | | | | | | | | | |
| Westfield Chautauqua Cty, NY | 30 | 150 | Great Lakes Shore | 395 | 15-1702 | 29 | 528 | (125 m) 4% | Cooper *et al.*2004 |
| **Spring 2005** | | | | | | | | | |
| Churubusco, Clinton Cty, NY | 39 | 310 | Great Lakes plain/ADK foothills | 254 | 3-728 | 40 | 422 | (120 m) 11% | Woodlot 2005a |
| Ellenberg, Clinton Cty, NY | n/a | n/a | Great Lakes plain/ADK foothills | 110 | n/a | 30 | 338 | (n/a) 20% | Mabee *et al.* 2006a |
| Dairy Hills, Clinton Cty, NY | n/a | n/a | Great Lakes shore | 117 | n/a | 14 | 397 | (n/a) 15% | ED&R 2006b |
| Clayton, Jefferson Cty, NY | 36 | 303 | Agricultural plateau | 450 | 71-1769 | 30 | 443 | (150 m) 14% | Woodlot 2005b |
| High Sheldon, Wyoming Cty, NY | 38 | 272 | Agricultural plateau | 112 | 6-558 | 25 | 418 | (120 m) 6% | Woodlot 2006a |
| Prattsburgh, Steuben Cty, NY | 20 | 183 | Agricultural plateau | 277 | 70-621 | 22 | 370 | (125 m) 16% | Woodlot 2005c |
| Prattsburgh, Steuben Cty, NY | 30 | 270 | Agricultural plateau | 170 | 3-844 | 18 | 319 | (125 m) 18% | Mabee *et al.* 2005a |
| Cohocton, Steuben Cty, NY | 3 | 29 | Agricultural plateau | 371 | 133-773 | 28 | 609 | (125 m) 12% | ED&R 2006a |
| Munnsville, Madison Cty, NY | 41 | 388 | Agricultural plateau | 160 | 6-1065 | 31 | 291 | (118 m) 25% | Woodlot 2005d |
| Fairfield, Herkimer Cty, NY | 40 | 369 | Agricultural plateau | 509 | 80-1175 | 44 | 419 | (125 m) 20% | Woodlot 2005e |
| Jordanville, Herkimer Cty, NY | 40 | 364 | Agricultural plateau | 409 | 26-1410 | 40 | 371 | (125 m) 21% | Woodlot 2005f |
| Sheffield, Caledonia Cty, VT | 20 | 179 | Forested ridge | 208 | 11-439 | 40 | 522 | (125 m) 6% | Woodlot 2006b |
| Deerfield, Bennington Cty, VT | 20 | 183 | Forested ridge | 404 | 74-973 | 69 | 523 | (125 m) 4% | Woodlot 2005g |
| Franklin, Pendleton Cty, WV | 23 | 204 | Forested ridge | 457 | 34-240 | 53 | 492 | (125 m) 11% | Woodlot 2005h |
| **Spring 2006** | | | | | | | | | |
| Chateaugay, Franklin Cty, NY | 35 | 300 | Agricultural plateau | 360 | 54-892 | 48 | 409 | (120 m) 18% | Woodlot 2006c |
| Wethersfield, Wyoming Cty, NY | 44 | n/a | Agricultural plateau | 324 | 41-907 | 12 | 355 | (125 m) 19% | Mabee et al. 2006b |
| Centerville, Allegany Cty, NY | 42 | n/a | Agricultural plateau | 290 | 25-1140 | 22 | 351 | (125 m) 16% | Mabee et al. 2006b |
| Howard, Steuben Cty, NY | 42 | 440 | Agricultural plateau | 440 | 35-2270 | 27 | 426 | (125 m) 13% | Woodlot 2006d |
| Deerfield, Bennington Cty, VT | 26 | 236 | Forested ridge | 263 | 5-934 | 58 | 435 | (100 m) 11% | Woodlot 2006e |
| Kibby, Franklin Cty, ME (Mtn) | 6 | 33 | Forested ridge | 456 | 88-1500 | 67 | 368 | (120 m) 14% | Woodlot 2006f |
| Kibby, Franklin Cty, ME (Range 1) | 10 | 80 | Forested ridge | 197 | 6-471 | 50 | 412 | (120 m) 22% | Woodlot 2006f |
| Kibby, Franklin Cty, ME (Range 2) | 7 | 57 | Forested ridge | 512 | 18-757 | 86 | 378 | (120 m) 25% | Woodlot 2006f |
| Kibby, Franklin Cty, ME (Valley) | 2 | 14 | Forested valley | 443 | 45-1242 | 61 | 334 | (120 m) n/a | Woodlot 2006f |
| Mars Hill, Aroostook Cty, ME | 15 | 85 | Forested ridge | 338 | 76-674 | 58 | 384 | (120 m) 14% | Woodlot 2006g |

# Appendix B

Bat survey results

**Appendix B Table 1**. Summary of acoustic bat data and weather during each survey night at the Ball Hill High detector – Spring 2007

| | | BBSHHB | | | | RBEP | | | MYSP | UNKN | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night of | Operated Okay? | big brown bat | hoary bat | silver-haired bat | silver-haired/big brown | eastern pipistrelle | eastern red bat | pipistrelle/red bat | MYSP | high-frequency | low-frequency | unknown | Total | Wind Speed (m/s) | Wind Direction (degrees) | Relative Humidity (%) | Temperature (celsius) |
| 3/28/07 | y | | | | | | | | | | | | **0** | | | | |
| 3/29/07 | y | | | | | | | | | | | | **0** | | | | |
| 3/30/07 | y | | | | | | | | | | | | **0** | | | | |
| 3/31/07 | y | | | | | | | | | | | | **0** | | | | |
| 4/1/07 | y | | | | | | | | | | | | **0** | | | 18.8 | 20.6 |
| 4/2/07 | n | | | | | | | | | | | | **n/o** | | | 21.9 | 22.0 |
| 4/3/07 | n | | | | | | | | | | | | **n/o** | | | 22.8 | 22.6 |
| 4/4/07 | n | | | | | | | | | | | | **n/o** | | | 22.8 | 22.1 |
| 4/5/07 | n | | | | | | | | | | | | **n/o** | | | 23.1 | 22.0 |
| 4/6/07 | n | | | | | | | | | | | | **n/o** | | | 21.5 | 21.9 |
| 4/7/07 | n | | | | | | | | | | | | **n/o** | | | 20.4 | 19.9 |
| 4/8/07 | n | | | | | | | | | | | | **n/o** | | | 19.4 | 19.8 |
| 4/9/07 | n | | | | | | | | | | | | **n/o** | | | 20.9 | 22.1 |
| 4/10/07 | n | | | | | | | | | | | | **n/o** | | | 20.1 | 22.5 |
| 4/11/07 | n | | | | | | | | | | | | **n/o** | | | 19.8 | 23.8 |
| 4/12/07 | n | | | | | | | | | | | | **n/o** | | | 24.6 | 1.7 |
| 4/13/07 | n | | | | | | | | | | | | **n/o** | | | 23.9 | 2.9 |
| 4/14/07 | n | | | | | | | | | | | | **n/o** | | | 24.6 | 5.9 |
| 4/15/07 | n | | | | | | | | | | | | **n/o** | | | 25.1 | 0.9 |
| 4/16/07 | n | | | | | | | | | | | | **n/o** | | | 81.5 | 1.2 |
| 4/17/07 | n | | | | | | | | | | | | **n/o** | | | 76.1 | 8.8 |
| 4/18/07 | y | | | | | | | | | | | | **0** | | | 91.4 | 1.9 |
| 4/19/07 | y | | | | | | | | | | | | **0** | | | 66.2 | 3.7 |
| 4/20/07 | y | | | | | | | | | | | | **0** | | | 43.5 | 5.5 |
| 4/21/07 | y | | | | | | | | | | | | **0** | | | 39.3 | 8.4 |
| 4/22/07 | y | | | | | | | | | 1 | | | **1** | | | 37.2 | 14.4 |
| 4/23/07 | y | | | | | | | | | | | | **0** | | | 87.0 | 10.3 |
| 4/24/07 | n | | | | | | | | | | | | **n/o** | | | 62.0 | 6.9 |
| 4/25/07 | n | | | | | | | | | | | | **n/o** | | | 96.7 | 4.1 |
| 4/26/07 | n | | | | | | | | | | | | **n/o** | | | 94.5 | 9.0 |
| 4/27/07 | n | | | | | | | | | | | | **n/o** | | | 93.8 | 7.7 |
| 4/28/07 | n | | | | | | | | | | | | **n/o** | | | 94.5 | 5.9 |
| 4/29/07 | n | | | | | | | | | | | | **n/o** | | | 60.7 | 12.4 |
| 4/30/07 | n | | | | | | | | | | | | **n/o** | | | 64.6 | 7.2 |
| 5/1/07 | n | | | | | | | | | | | | **n/o** | | | 96.9 | 7.0 |
| 5/2/07 | n | | | | | | | | | | | | **n/o** | | | 56.8 | 7.5 |
| 5/3/07 | n | | | | | | | | | | | | **n/o** | | | 37.5 | 6.9 |
| 5/4/07 | n | | | | | | | | | | | | **n/o** | | | 40.0 | 9.3 |
| 5/5/07 | n | | | | | | | | | | | | **n/o** | | | 35.6 | 6.7 |
| 5/6/07 | n | | | | | | | | | | | | **n/o** | | | 50.9 | 5.2 |
| 5/7/07 | n | | | | | | | | | | | | **n/o** | | | 38.0 | 12.3 |
| 5/8/07 | n | | | | | | | | | | | | **n/o** | | | 60.9 | 15.6 |
| 5/9/07 | n | | | | | | | | | | | | **n/o** | | | 55.8 | 16.2 |
| 5/10/07 | y | | | | | | | | | | | | **0** | | | 78.7 | 14.0 |
| 5/11/07 | y | | | | | | | | | | | | **0** | | | 82.9 | 12.8 |
| 5/12/07 | y | | | | | | | | | | | | **0** | | | 65.3 | 5.0 |
| 5/13/07 | y | | | | | | | | | | | | **0** | | | 47.2 | 5.5 |
| 5/14/07 | y | | | | | | | | | | | | **0** | | | 43.3 | 15.5 |
| 5/15/07 | y | | | | 1 | | | | 1 | | | | **2** | | | 84.3 | 17.0 |
| 5/16/07 | y | | | | | | | | | | | | **0** | | | 93.8 | 6.6 |
| 5/17/07 | y | | | 1 | | | | | | | | | **1** | | | 86.8 | 4.3 |
| 5/18/07 | y | | | | | | | | | | | | **0** | | | 72.6 | 6.8 |
| 5/19/07 | y | | | | | | | | | | | | **0** | | | 85.1 | 11.0 |
| 5/20/07 | y | | | | | | | | | | | | **0** | | | 95.4 | 5.4 |
| 5/21/07 | y | | | | | | | | | | | | **0** | | | 69.3 | 7.6 |
| 5/22/07 | y | | | | | | | | | | | | **0** | | | 64.3 | 14.0 |
| 5/23/07 | y | | | | | | | | | | | | **0** | | | 68.2 | 18.3 |
| 5/24/07 | y | | | | | | | | | | | | **0** | | | 71.6 | 19.4 |
| 5/25/07 | y | | | | | | | | | | | | **0** | | | 83.0 | 16.7 |
| 5/26/07 | y | | | | | | | | | | | | **0** | | | 94.7 | 14.9 |
| 5/27/07 | y | | | | | | | | | | | | **0** | | | 90.9 | 15.0 |
| 5/28/07 | y | | | | | | | | | | | | **0** | | | 74.9 | 11.1 |
| 5/29/07 | y | | | | | | | | | | | | **0** | | | 66.0 | 14.4 |
| 5/30/07 | y | | | | | | | | | | | | **0** | | | 76.2 | 18.6 |
| 5/31/07 | n | | | | | | | | | | | | **n/o** | | | 88.3 | 18.0 |
| **By Species** | | **0** | **0** | **1** | **1** | **0** | **0** | **0** | **1** | **1** | **0** | **0** | **4** | | | | |
| **By Guild** | | **2** | | | | **0** | | | **1** | **1** | | | **4** | | | | |
| | | **BBSHHB** | | | | **RBEP** | | | **MYSP** | **UNKN** | | | **Total** | | | | |

n/o - indicates that detector was not operating on that night

**Appendix B Table 2**. Summary of acoustic bat data and weather during each survey night at the Ball Hill Low detector – Spring 2007

| | | BBSHHB | | | | RBEP | | | MYSP | UNKN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night of | Operated Okay? | big brown bat | hoary bat | silver-haired bat | silver-haired/big brown | eastern pipistrelle | eastern red bat | pipistrelle/red bat | MYSP | high-frequency | low-frequency | unknown | Total | Relative Humidity (%) | Temperature (celsius) |
| 3/28/07 | y | | | | | | | | | | | | **0** | | |
| 3/29/07 | y | | | | | | | | | | | | **0** | | |
| 3/30/07 | y | | | | | | | | | | | | **0** | | |
| 3/31/07 | y | | | | | | | | | | | | **0** | | |
| 4/1/07 | y | | | | | | | | | | | | **0** | 18.8 | 20.6 |
| 4/2/07 | y | | | | | | | | | | | | **0** | 21.9 | 22.0 |
| 4/3/07 | y | | | | | | | | | | | | **0** | 22.8 | 22.6 |
| 4/4/07 | y | | | | | | | | | | | | **0** | 22.8 | 22.1 |
| 4/5/07 | y | | | | | | | | | | | | **0** | 23.1 | 22.0 |
| 4/6/07 | y | | | | | | | | | | | | **0** | 21.5 | 21.9 |
| 4/7/07 | n | | | | | | | | | | | | **n/o** | 20.4 | 19.9 |
| 4/8/07 | n | | | | | | | | | | | | **n/o** | 19.4 | 19.8 |
| 4/9/07 | n | | | | | | | | | | | | **n/o** | 20.9 | 22.1 |
| 4/10/07 | n | | | | | | | | | | | | **n/o** | 20.1 | 22.5 |
| 4/11/07 | n | | | | | | | | | | | | **n/o** | 19.8 | 23.8 |
| 4/12/07 | n | | | | | | | | | | | | **n/o** | 24.6 | 1.7 |
| 4/13/07 | n | | | | | | | | | | | | **n/o** | 23.9 | 2.9 |
| 4/14/07 | n | | | | | | | | | | | | **n/o** | 24.6 | 5.9 |
| 4/15/07 | n | | | | | | | | | | | | **n/o** | 25.1 | 0.9 |
| 4/16/07 | n | | | | | | | | | | | | **n/o** | 81.5 | 1.2 |
| 4/17/07 | y | | | | | | | | | | | | **0** | 76.1 | 8.8 |
| 4/18/07 | y | | | | | | | | | | | | **0** | 91.4 | 1.9 |
| 4/19/07 | y | | | | | | | | | | | | **0** | 66.2 | 3.7 |
| 4/20/07 | y | | | | | | | | | | | | **0** | 43.5 | 5.5 |
| 4/21/07 | y | 1 | | | | | | | | | | | **1** | 39.3 | 8.4 |
| 4/22/07 | y | | | | | | | | | | | 1 | **1** | 37.2 | 14.4 |
| 4/23/07 | y | | | | | | | | | | | | **0** | 87.0 | 10.3 |
| 4/24/07 | y | | | | | | | | 1 | | | | **1** | 62.0 | 6.9 |
| 4/25/07 | y | | | | | | | | 1 | | | | **1** | 96.7 | 4.1 |
| 4/26/07 | y | | | | | | | | | | | | **0** | 94.5 | 9.0 |
| 4/27/07 | y | | | | | | | | | | | | **0** | 93.8 | 7.7 |
| 4/28/07 | y | | | | | | | | | | | | **0** | 94.5 | 5.9 |
| 4/29/07 | y | | | | | | | | 2 | | | | **2** | 60.7 | 12.4 |
| 4/30/07 | y | | | | | | | | | 1 | | | **1** | 64.6 | 7.2 |
| 5/1/07 | y | | | | | | | | | | | | **0** | 96.9 | 7.0 |
| 5/2/07 | y | | | | | | | | 3 | | | | **3** | 56.8 | 7.5 |
| 5/3/07 | y | | | | | | | | 5 | 3 | | | **8** | 37.5 | 6.9 |
| 5/4/07 | y | | | | 1 | | | | 3 | 4 | | | **8** | 40.0 | 9.3 |
| 5/5/07 | y | | | | 1 | | | | 1 | | | | **2** | 35.6 | 6.7 |
| 5/6/07 | y | | | | | | | | 2 | | | | **2** | 50.9 | 5.2 |
| 5/7/07 | y | | | | 1 | | | | 2 | 2 | | | **5** | 38.0 | 12.3 |
| 5/8/07 | y | 1 | | | | | | | 4 | 8 | | | **13** | 60.9 | 15.6 |
| 5/9/07 | y | | | | 4 | | | | | 8 | | 1 | **13** | 55.8 | 16.2 |
| 5/10/07 | y | | | | 2 | | | | | 4 | | | **6** | 78.7 | 14.0 |
| 5/11/07 | y | | | | 2 | | | | | | | | **2** | 82.9 | 12.8 |
| 5/12/07 | y | | | | | | | | | | | | **0** | 65.3 | 5.0 |
| 5/13/07 | y | | | | | | | | | | | | **0** | 47.2 | 5.5 |
| 5/14/07 | y | | | | | | | | | | | | **0** | 43.3 | 15.5 |
| 5/15/07 | y | | | | 1 | | | | 1 | 1 | | 1 | **4** | 84.3 | 17.0 |
| 5/16/07 | y | | | | 1 | | | | | | | | **1** | 93.8 | 6.6 |
| 5/17/07 | y | | | | | | | | | | | | **0** | 86.8 | 4.3 |
| 5/18/07 | y | | | | | | | | | | | | **0** | 72.6 | 6.8 |
| 5/19/07 | y | | | | | | | | | | | | **0** | 85.1 | 11.0 |
| 5/20/07 | y | | | | | | | | | | | | **0** | 95.4 | 5.4 |
| 5/21/07 | y | | | | | | | | | | | | **0** | 69.3 | 7.6 |
| 5/22/07 | y | | | | | | | | | | | | **0** | 64.3 | 14.0 |
| 5/23/07 | y | | | | | | | | | | | | **0** | 68.2 | 18.3 |
| 5/24/07 | y | | | | | | | | | | | | **0** | 71.6 | 19.4 |
| 5/25/07 | y | | | | | | | | | | | | **0** | 83.0 | 16.7 |
| 5/26/07 | y | | | | | | | | | | | | **0** | 94.7 | 14.9 |
| 5/27/07 | y | | | | | | | | | | | | **0** | 90.9 | 15.0 |
| 5/28/07 | y | | | | | | | | | | | | **0** | 74.9 | 11.1 |
| 5/29/07 | y | | | | | | | | | | | | **0** | 66.0 | 14.4 |
| 5/30/07 | y | | | | | | | | | | | | **0** | 76.2 | 18.6 |
| 5/31/07 | n | | | | | | | | | | | | **n/o** | 88.3 | 18.0 |
| **By Species** | | **2** | **0** | **0** | **13** | **0** | **0** | **0** | **25** | **31** | **0** | **3** | **74** | | |
| **By Guild** | | **15** | | | | **0** | | | **25** | **34** | | | | | |
| | | **BBSHHB** | | | | **RBEP** | | | **MYSP** | **UNKN** | | | **Total** | | |

n/o - indicates that detector was not operating on that night

| **Appendix B, Table 3.** Summary of available spring bat detector survey results | | | |
|---|---|---|---|
| **Project Site** | **Landscape** | **Calls Per Detector Night** | **Citation** |
| **Spring 2005** | | | |
| Churubusco, Clinton County, NY | Great Lakes plain/ADK foothills | 0.26 | Woodlot 2005a |
| Clayton, Jefferson County, NY | Agricultural plateau | 0.90 | Woodlot 2005b |
| Sheldon, Wyoming County, NY | Agricultural plateau | 0.17 | Woodlot 2006a |
| Prattsburgh, Steuben County, NY | Agricultural plateau | 0.28 | Woodlot 2005c |
| Cohocton, Steuben County, NY | Agricultural plateau | 0.72 | Woodlot 2006h |
| Munnsville, Madison County, NY | Agricultural plateau | 0.27 | Woodlot 2005d |
| Fairfield, Herkimer County, NY | Agricultural plateau | | Woodlot 2005e |
| Jordanville, Herkimer County, NY | Agricultural plateau | 0.50 | Woodlot 2005f |
| Sheffield, Caledonia County, VT | Forested ridge | 0.17 | Woodlot 2006b |
| Deerfield, Bennington County, VT | Forested ridge | 0.07 | Woodlot 2005g |
| Franklin, Pendleton County, WV | Forested ridge | 0.50 | Woodlot 2005h |
| **Spring 2006** | | | |
| Chateaugay, Franklin County, NY | Agricultural plateau | 2.00 | Woodlot 2006c |
| Brandon, Franklin County, NY | Agricultural plateau | 13.00 | Woodlot 2006c |
| Wethersfield, Wyoming County, NY | Agricultural plateau | 1.50 | Woodlot 2006i |
| Centerville, Allegany County, NY | Agricultural plateau | 2.10 | Woodlot 2006i |
| Howard, Steuben County, NY | Agricultural plateau | 0.40 | Woodlot 2006d |
| Sheffield, Caledonia County, VT | Forested ridge | 7.90 | Woodlot 2006b |
| Deerfield, Bennington County, VT | Forested ridge | 0.10 | Woodlot 2006e |
| Kibby, Franklin County, ME | Forested ridge | 0.30 | Woodlot 2006f |

# C Acoustical Monitoring Study, Fall 2007 (Woodlot Alternatives, Inc.)

# Fall 2007 Bat Migration Survey Report

A Fall 2007 Acoustic Bat Survey of Bat Migration
at the Proposed Ball Hill Windpark, Villenova and Hanover, NY

Prepared for

Noble Environmental Power, LLC
&
Ecology and Environment, Inc

Prepared by

Stantec Consulting
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30 Park Drive
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**July 2008**

# Executive Summary

During fall 2007, Woodlot Alternatives, Inc. (Woodlot)[1], now Stantec Consulting (Stantec), conducted field surveys of bat migration activity at the Ball Hill Windpark in western New York (project). The surveys are part of the planning process by Noble Environmental Power, LLC (Noble), the developer of that site. These surveys represented the second season of investigation undertaken at this site. Surveys included passive nighttime surveys of bats using bat echolocation detectors. The results of the field surveys provide useful information about site-specific migration activity and patterns in the vicinity of the project.

Two acoustic detectors were deployed in a meteorological measurement tower located in an agricultural field and collected a total of 154 detector-nights from July 30 to October 14, 2007. A total of 541 bat call sequences were recorded by the detectors for a mean detection rate of 3.5 detections per detector-night for both detectors combined. The detection rate was generally slightly higher than other recent fall studies in New York and the region. Habitat, landscape, location, and survey effort probably account for the observed differences.

Bat calls were identified to the lowest possible taxonomic level. Calls were then grouped into four guilds based on call characteristics, because the frequency division detectors do not adequately differentiate among similar calls of some species. The majority of calls (54%) were identified as unknown, followed by species from the big brown guild (36%) and the *myotis* and red bat/eastern pipistrelle guilds (both 5%). This trend in species composition is similar to that of other studies in the region.

[1] Field work and subsequent report filings performed prior to October 1, 2007, were done so as Woodlot Alternatives, Inc. On October 1, 2007, Woodlot Alternatives, Inc. was acquired by Stantec Consulting Services, Inc.

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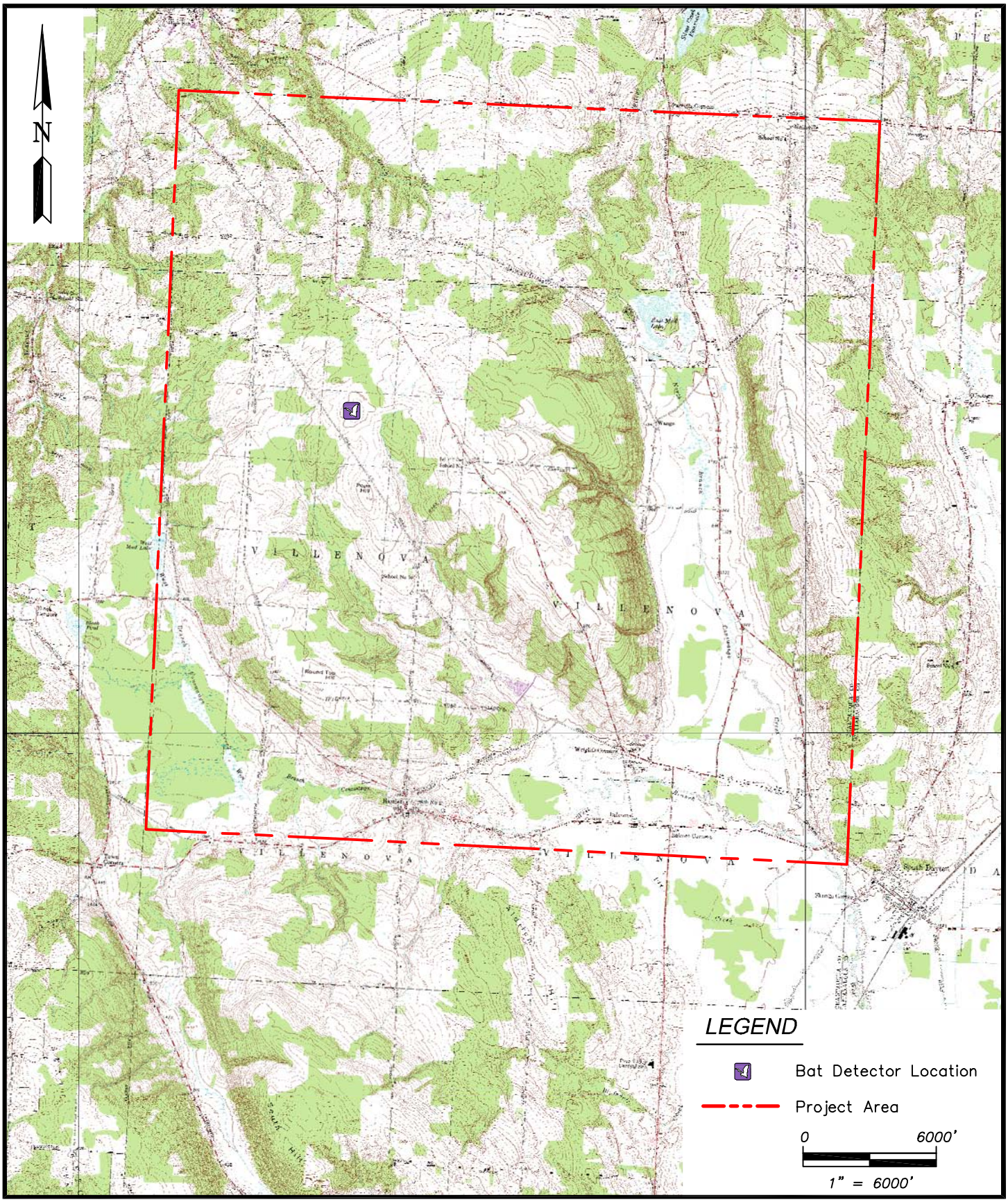
PN195600064/106193

# 1.0 Introduction

Noble Environmental Power, LLC (Noble) has proposed the construction of a wind development located in Villenova and Hanover, New York (project; Figure 1). The project is located on an agricultural plateau surrounded by gently sloping flat-topped ridges, characteristic of the Cattaraugus Highlands. The project area is approximately 12.9 kilometers (km; 8 miles [mi]) southeast of Lake Erie. The area is largely agricultural and approximately 30 percent of the landscape forested with oak-dominated hardwoods. The elevation of the area ranges from 457 to 518 meters (m) (1,500 to 1,700 feet [']).

Woodlot Alternatives, Inc. (Woodlot), now Stantec Consulting (Stantec)[2], conducted an acoustic detector survey of nocturnal bat migration in the project area during fall 2007 migration period. This is the second of two seasons of bat detector surveys conducted at this site. Acoustic bat detectors allow for long-term monitoring of activity patterns of bats in a variety of habitats, including the air space approaching the rotor-swept zone of modern wind turbines. The acoustic bat survey at Ball Hill was designed to document bat activity patterns near the rotor zone of the proposed turbines and at an intermediate height. Acoustic surveys were also intended to document bat activity patterns in relation to weather factors including temperature and relative humidity.

[2] All field work and any reporting and permitting activities performed prior to October 1, 2007, were conducted as Woodlot Alternatives, Inc. and will be herein referenced as work done by Woodlot. On October 1, 2007, Woodlot Alternatives, Inc. was acquired by Stantec Consulting Services, Inc. Work conducted on or after October 1, 2007, is herein referenced as work done by Stantec.




PREPARED BY:

Stantec

WOODLOT

106193-F001-bat.dwg

SHEET TITLE:

Bat Detector Location Map

PROJECT:

Proposed Noble Ball Hill Windpark
Villenova and Hanover, New York

DATE: January 30, 2008
SCALE: 1"=6000'
PROJ. NO.: 106193
FIGURE: 1

# 2.0 Acoustic Bat Survey

Nine species of bats occur in New York, based upon their normal geographical range. These are the little brown bat (*Myotis lucifugus*), northern long-eared bat, (*M. septentrionalis*), Indiana bat (*M. sodalis*), eastern small-footed bat (*M. leibii*), silver-haired bat (*Lasionycteris noctivagans*), eastern pipistrelle (*Pipistrellus subflavus*), big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), and hoary bat (*L. cinereus*) (Whitaker and Hamilton 1998). Of these, the Indiana bat is listed as federally endangered, and the small-footed bat is a state-listed species of special concern. According to the New York Department of Environmental Conservation (NYSDEC), ten Indiana bat hibernacula are present in New York, located in Albany (1), Essex (2), Jefferson (1), Onondaga (1), Ulster (4), and Warren (1) counties. Essex, Warren, Albany, and Ulster counties are located in a north-south band along the Hudson River, whereas Jefferson and Onondaga counties are located more than 250 km (156 mi) northeast of Ball Hill, near the center of the state.

## 2.1 METHODS

### 2.1.1 Field Surveys

Two Anabat II detectors (Titley Electronics Pty Ltd.) were deployed for the duration of the fall 2007 acoustic bat survey. Each Anabat detector was coupled with CF Storage ZCAIM (Titley Electronics Pty Ltd.), which programmed the on/off times and stored data on removable 1 GB compact flash cards. Anabat detectors, which record the bat calls for subsequent analysis, are frequency division detectors that divide the frequency of ultrasonic calls made by bats by a factor of 16 so that they are audible to humans. Anabat detectors were selected based upon their widespread use for this type of survey, their ability to be deployed for long periods of time, and their ability to detect a broad frequency range, which allows detection of all species of bats that could occur in the project area.

Two detectors were deployed in a met tower in the project area, the same location used for the spring surveys. The detectors were placed at heights of approximately 20 m (66') and 40 m (132') above the ground using the on-site met tower. Deployment in this fashion allowed for data collection at two different heights. The met tower was in an agricultural field in a west-central location in the project area (Figure 1). Detectors were deployed from July 30 through October 14, 2007. Detectors were programmed to record data continuously between 7:00 pm and 7:00 am each night and powered by 12-volt batteries charged by solar panels.

Each solar-powered Anabat system was deployed in a waterproof housing enabling the detector to record while unattended for the duration of the survey. The housing suspends the Anabat microphone downward to give maximum protection from precipitation. To compensate for the downward position, a reflector shield of smooth plastic is placed at a 45-degree angle directly below the microphone. The angled reflector allows the microphone to record the airspace

horizontally surrounding the detector and is only slightly less sensitive than an unmodified Anabat unit.

Maintenance visits were conducted approximately every two weeks to check on the condition of the detectors and download data to a computer for analysis. The sensitivity of each Anabat system was set at between six and seven to maximize sensitivity while limiting ambient background noise and interference. The sensitivity of individual detectors was tested using an ultrasonic Bat Chirp (Reno, Nevada) to ensure that the detectors would be able to detect bats up to a distance of at least 10 m (33').

### 2.1.2 Data Analysis

Potential call files were extracted from data files using CFCread© software. The default settings for CFCread© were used during this file extraction process, as these settings are recommended for the calls or call sequences that are characteristic of northeastern bats. A call is a single pulse of sound produced by a bat. A call sequence is a combination of two or more pulses recorded in a call file. Analook software screens and filters all data recorded by the bat detector and extracts only those files with potential bat calls. Using the default settings for this initial screen also ensures comparability among data sets. Settings used by the filter include a max TBC (time between calls) of 5 seconds, a minimum line length of 5 milliseconds, and a smoothing factor of 50. The smoothing factor refers to whether or not adjacent pixels can be connected with a smooth line. The higher the smoothing factor, the less restrictive the filter is and the more noise files and poor quality call sequences are retained within the data set. Understanding these parameters of these settings is important in terms of determining when individual calls are classified as "unknown".

Following extraction of call files, each retained file was visually inspected to ensure that files created by static or some other form of interference that were still within the frequency range of bats were not included in the data set. Bat calls typically include a series of pulses characteristic of normal flight or prey location ("search phase" calls) and capture periods (feeding "buzzes") and visually look very different than static, which typically forms a diffuse band of dots at either a constant frequency or widely varying frequency, caused by wind, vibration, or other interference. Using these pulse characteristics, bat call files are easily distinguished from non-bat files.

Bat call sequences were individually marked and categorized by species group, or "guild" based on visual comparison to reference calls. Qualitative visual comparison of recorded call sequences of sufficient length to reference libraries of bat calls allows for relatively accurate identification of bat species (O'Farrell *et al*. 1999, O'Farrell and Gannon 1999). A call sequence was considered of suitable quality and duration if the individual call pulses were "clean" (i.e., consisting of sharp, distinct lines) and at least five pulses were included within the sequence. Call sequences were classified to species whenever possible, based on criteria developed from review of reference calls collected by Chris Corben, the developer of the Anabat system, and other bat researchers. However, due to similarity of call signatures among several species, all

classified calls have been categorized into four guilds for presentation in this report. This classification scheme follows that of Gannon *et al.* (2003) and is as follows:

- **Myotid (MYSP)** – All bats of the genus *Myotis*. While there are some general characteristics believed to be distinctive for several of the species in this genus, these characteristics do not occur consistently enough for any one species to be relied upon at all times when using Anabat recordings;

- **Red bat/pipistrelle (RBEP)** – Eastern red bats and eastern pipistrelles. Like many of the other northeastern bats, these two species can produce calls distinctive only to each species. However, significant overlap in the call pulse shape, frequency range, and slope can also occur.

- **Big brown/silver-haired/hoary bat (BBSHHB)** – This guild will be referred to as the big brown guild. These species' call signatures commonly overlap and have therefore been included as one guild in this report, and;

- **Unknown (UNKN) –** All call sequences with too few pulses (less than five) or of poor quality (such as indistinct pulse characteristics or background static). These calls were further identified as either "high frequency unknown" (HFUN) for calls above 35 kHz or "low frequency unknown" (LFUN) for calls below 35 kHz.

This guild grouping represents the most conservative approach to bat call identification (Hayes 2000). Since some species do sometimes produce calls unique only to that species, all calls were identified to the lowest possible taxonomic level before being grouped into the listed guilds. Tables and figures in the body of this report will reflect those guilds. However, since species-specific identification did occur in some cases, each guild will also be briefly discussed with respect to potential species composition of recorded call sequences.

Once all of the call files were identified and categorized in appropriate guilds, nightly tallies of detected calls were compiled. Mean detection rates (number of calls/detector-night) for the entire sampling period were calculated for each detector and for all detectors combined. It is important to note that detection rates indicate only the number of calls detected and do not necessarily reflect the number of individual bats in an area. For example, a single individual can produce one or many call files recorded by the bat detector, but the bat detector cannot differentiate among individuals of the same species or similar sounding species producing those calls. Consequently, detections recorded by the bat detector system could over-represent the actual number of animals that produced the recorded calls.

### 2.1.3 Weather Data

Temperature, relative humidity, and dew point were recorded for the duration of the survey period at 10-minute intervals by data loggers (HOBO Pro v2 U23-001, Onset Computer Corporation) placed on at least one of the bat detector systems. The mean, maximum, and

minimum temperature, relative humidity, and dew point were calculated for each night. The data collected by the HOBO datalogger were collected from August 1 to October 14, 2007.

## 2.2 RESULTS

### 2.2.1 Detector Call Analysis

Detectors were deployed from July 30 through October 14, 2007 for a total survey period of 154 detector nights. Occasional data gaps occurred when the detectors powered down. A total of 541 bat call sequences were recorded during the sampling period (Table 2-1). The overall mean detection rate for both detectors was 3.5 calls/detector night. Detection rates at both detectors ranged from 3.2 calls/detector-night by the high detector to 3.8 calls/detector-night by the low detector.

**Table 2-1.** Summary of bat detector field survey effort and results

| Location | Dates | # Detector-Nights* | # Recorded Sequences | Detection Rate ** | Maximum # Calls Recorded *** |
|---|---|---|---|---|---|
| High Detector | 7/30-10/14 | 77 | 246 | 3.2 | 22 |
| Low Detector | 7/30-10/14 | 77 | 295 | 3.8 | 20 |
| ***Overall Results*** | | ***154*** | ***541*** | ***3.5*** | -- |

* Detector-night is a sampling unit during which a single detector is deployed overnight. On nights when two detectors are deployed, the sampling effort equals two detector-nights, etc.

** Number of bat passes recorded per detector-night.

*** Maximum number of bat passes recorded from any **single** detector for a 12-hour sampling period.

The number of call sequences recorded by each detector ranged from 246 (by the high detector) to 295 (by the low detector). The maximum number of call sequences recorded in one night at the high detector was 22 and at the low detector was 20 (Figure 2). Nights with peak activity occurred in on August 28 and 29 at the high detector, and on September 21 at the low detector, with smaller peaks on September 10 and August 28.

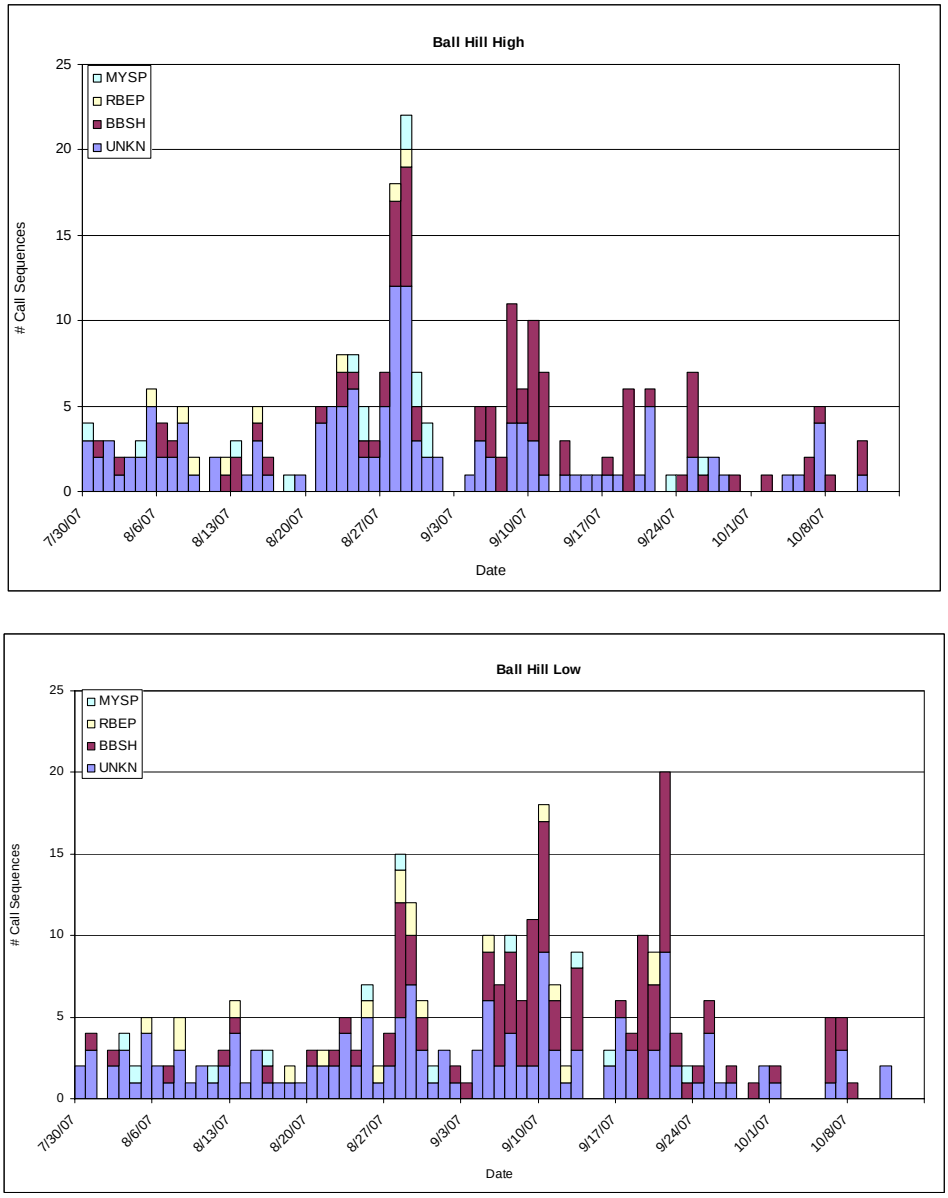



**Figure 2.** Total nightly bat call sequence detections

The majority of the recorded call sequences (54%) were labeled as unknown due to very short call sequences (less than five pulses) or poor call signature formation (probably due to a bat flying at the edge of the detection zone of the detector or flying away from the microphone) (Table 2-2). Of the calls that were identified to species or guild, those of the BBSHHB guild were the most common (36% of all call sequences) followed by the species within the RBEP and MYSP guilds (both at 5% of all call sequences). Species composition was similar between the high and low detectors (Figure 2).

**Table 2-2.** Summary of the composition of recorded bat call sequences.

| Detector | Guild | | | | Total |
|---|---|---|---|---|---|
| | Big brown guild | Red bat/ E. pipistrelle | Myotis | Unknown | |
| High Detector | 86 | 8 | 15 | 137 | 246 |
| Low Detector | 111 | 19 | 11 | 154 | 295 |
| ***Total*** | ***197*** | ***27*** | ***26*** | ***291*** | ***541*** |

Appendix A provides a series of tables with more specific information on the nightly timing, number, and species composition of recorded bat call sequences. Specifically, Appendix A Tables 1 and 2 provide information on the number of call sequences, by guild and suspected species, recorded at each detector and the weather conditions for that night. Upon request, Stantec can provide a table with the detailed information for all 541 recorded call sequences, including the Analook file name, the night during which the call sequence was recorded, the timing of the recording, and the suspected identity of the species recorded.

Overall, the nightly timing of bat activity peaked at approximately 8:00 pm (Figure 3).

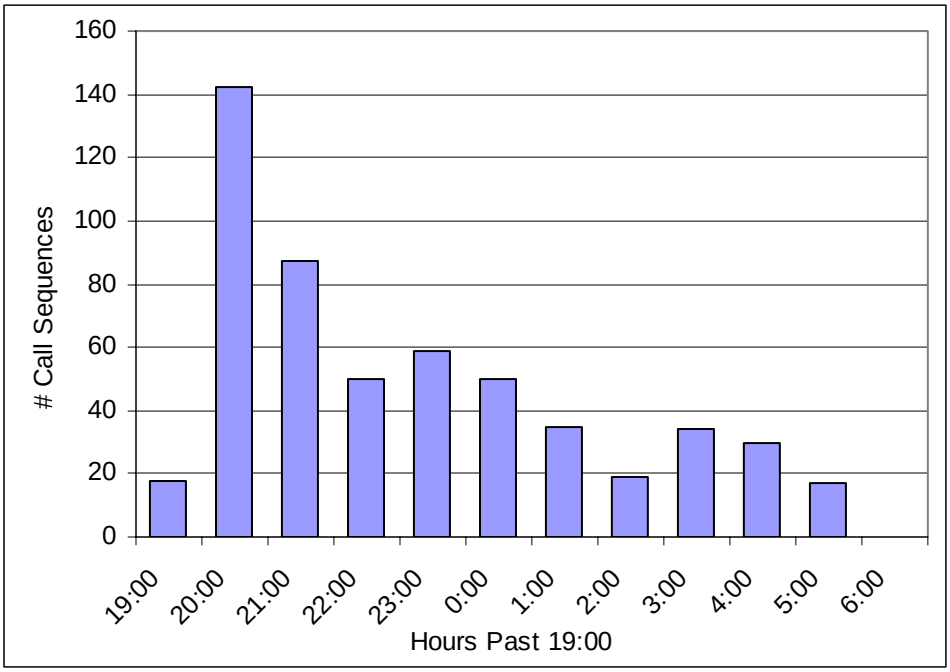



**Figure 3.** Hourly distribution of bat call sequences recorded by both detectors

### 2.2.2 Weather Data

Mean nightly temperatures varied between 6.1º C (43º F) and 23.7º C (74.6º F), with an overall mean of 16.3ºC (61.3º F; Figure 4). Nightly mean relative humidity ranged from 57 percent to 99 percent (Figure 5). A linear regression of recorded echolocation sequences and mean nightly temperature and echolocation sequences and mean nightly humidity found no correlations at both detectors (Figure 6).

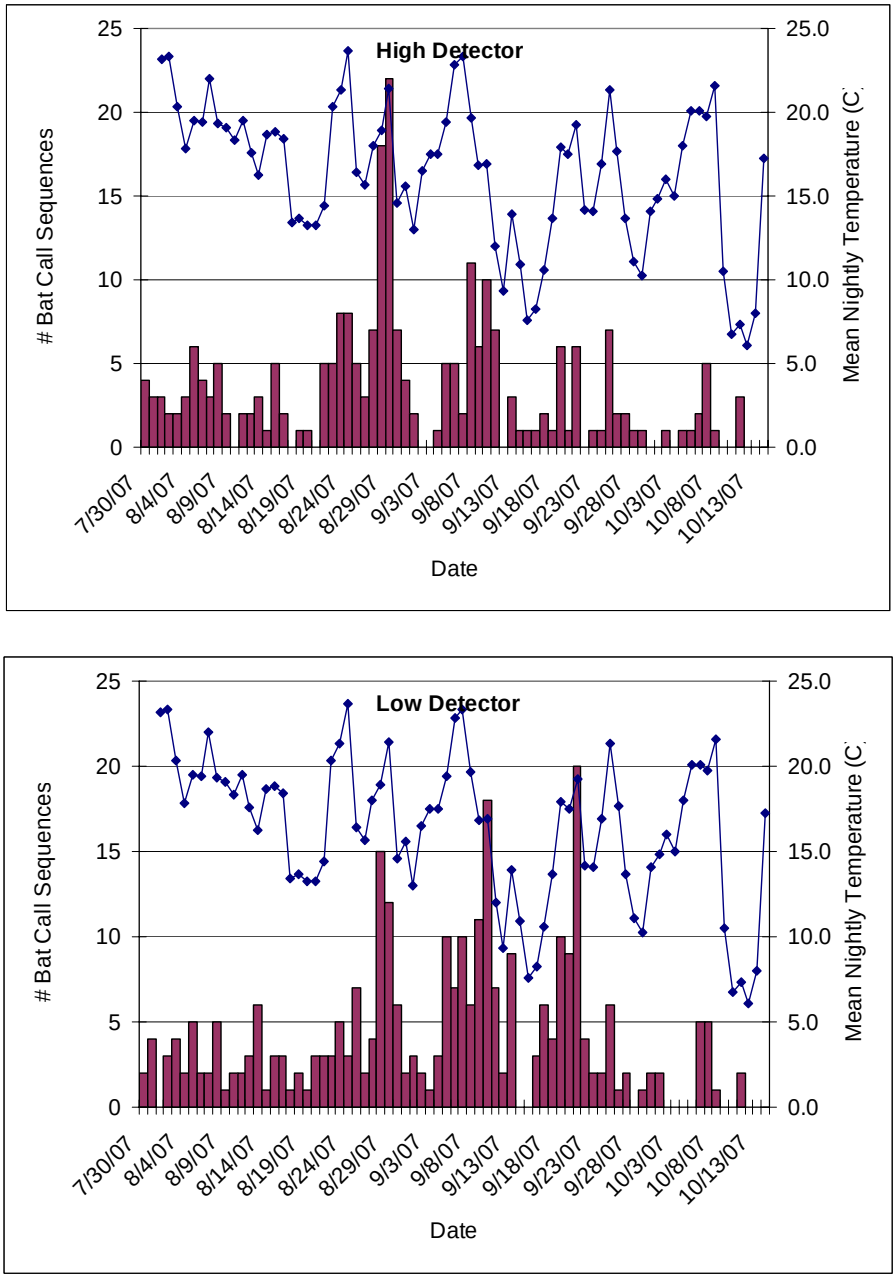



**Figure 4.** Nightly mean temperature (Celsius; blue line) and bat detections

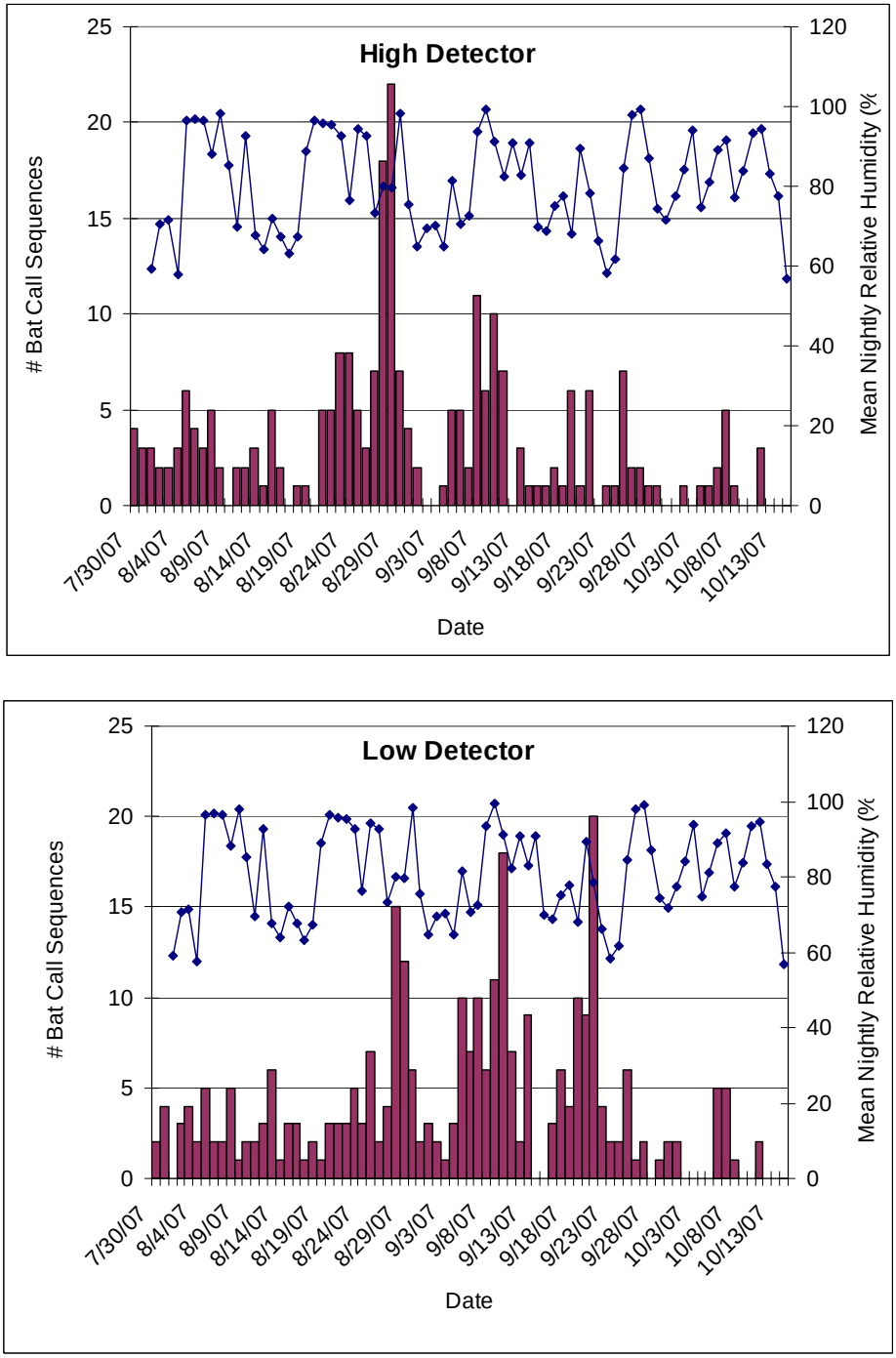



**Figure 5**. Nightly mean relative humidity (blue line) and bat detections

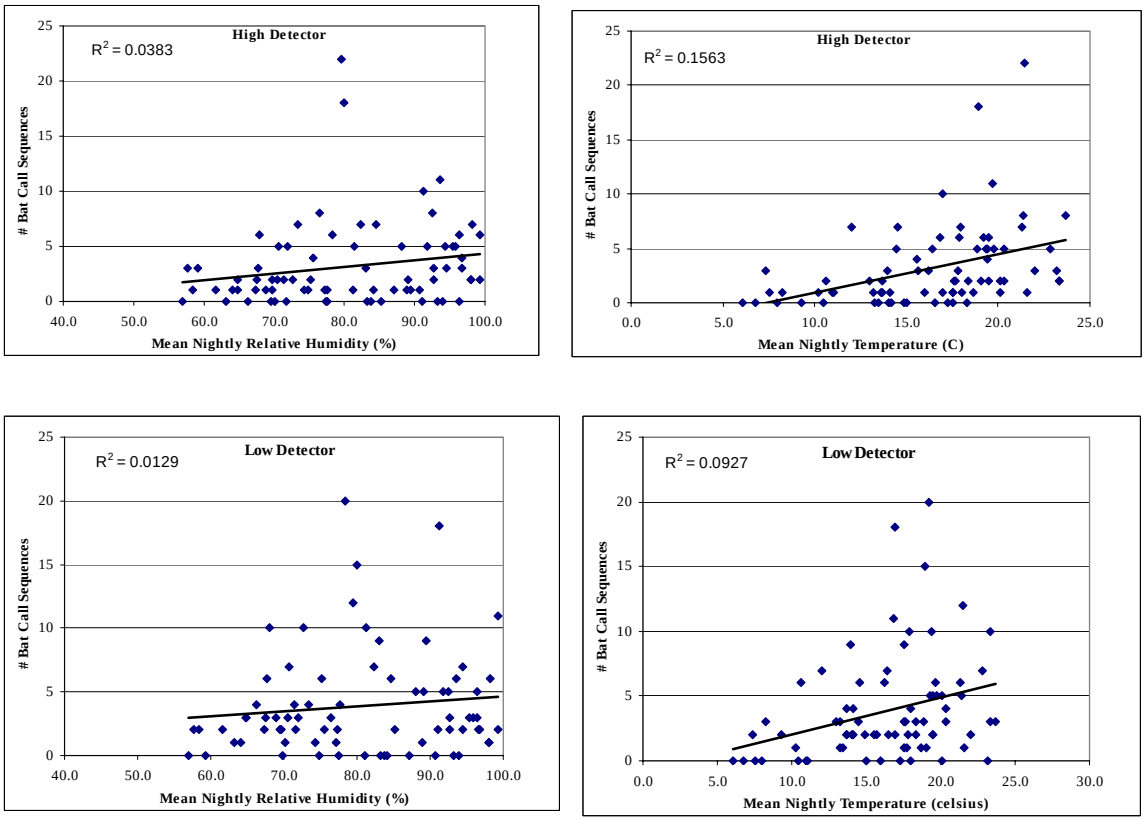



**Figure 6.** Relationship between mean nightly relative humidity (left) and bat activity levels and mean nightly temperature (right) and bat activity levels.

## 2.3 DISCUSSION

Fall bat echolocation surveys at Ball Hill documented moderate levels of bat activity from August through mid October. The overall mean detection rate during the fall survey period was 3.5 calls/detector-night. These rates are similar to other fall bat detector surveys conducted recently (Appendix A, Table 3).

Bat calls were identified to guild within this report, although calls were provisionally categorized by species when possible during analysis. Certain species, such as the eastern red bat and hoary bat have easily identifiable calls, whereas other species, such as the big brown bat and silver-haired bat, are difficult to distinguish acoustically. Similarly, certain members of the *Myotis* genus, such as the little brown bat are far more common and have slightly more distinguishable calls than other species. The following paragraphs discuss each guild separately and address likely species composition of recorded bats within each guild.

The MYSP guild includes all four species of *Myotis* potentially occurring in the project area, including the little brown bat, northern long-eared bat, eastern small-footed bat, and the federally endangered Indiana bat. Of these species, the little brown bat and northern long-eared bat are by far the most common and have calls that tend to be slightly more

distinguishable using the Anabat system. None of the 26 *Myotis* calls recorded at Ball Hill during the fall 2007 survey could be identified to a particular species of *Myotis*.

The RBEP guild includes the eastern pipistrelle and eastern red bat. Eastern red bats have relatively unique calls which span a wide range of frequency and have a characteristic hooked shape and variable minimum frequency. Eastern pipistrelles tend to have relatively uniform calls, with a constant minimum frequency and a sharply curved profile. Of the 27 calls classified as RBEP, 19 were classified as red bats, one call was classified as an eastern pipistrelle and seven were classified as RBEP because they lacked sufficient characteristics to be identified definitively as either species. Eastern pipistrelles tend to be solitary foragers, often feeding over water and emerging around sunset, whereas eastern red bats will occasionally forage in groups of 20-30 individuals and emerge 1-2 hours after sunset (DeGraaf and Yamasaki 2001).

The BBSHHB guild includes the big brown bat, silver-haired bat, and hoary bat. Within this grouping, the hoary bat has easily distinguishable calls characterized by highly variable minimum frequencies often extending below 20 kHz, and a hooked profile similar to the eastern red bat. Calls of silver-haired bats and big brown bats are occasionally distinguishable, but often overlap in range and can be difficult to distinguish, especially when comparing short duration calls typical of those recorded during passive monitoring. Of the 197 calls classified as BBSHHB, 52 were classified as silver-haired bats, 30 were hoary bats, 1 was a big brown bat, and 114 lacked sufficient characteristics to be label as a specific species of the BBSHHB guild. Typically with this type of survey there is a noticeable difference in species distribution between the high and low detectors, with the larger species of the BBSHHB guild recorded more frequently at higher elevations and smaller species such as those of the MYSP guild recorded at the lower detectors. The high and the low detectors at Ball Hill, however, recorded similar numbers of species within the BBSHHB guild.

Of the 541 total calls recorded at Ball Hill, 291 or 54 percent were classified as UNKN, due to their short duration or poor quality. These unknown calls were identified as “high frequency” or “low frequency”. The high and low met tower detectors recorded similar numbers and composition of unknown bat calls. The high detector recorded 137 unknown bat calls; 38 percent of those were high-frequency (n = 52) and 62 percent were low-frequency (n = 85). The low detector recorded 154 unknown bat call sequences; 40 percent were high frequency (n=62), 59 percent were low-frequency (n = 91), and one was classified as an unknown. Both the high and low detectors recorded more BBSHHB call sequences than any other guild. The characteristics of low frequency unknown calls at both the high and low detectors appear similar to calls belonging to the BBSHHB guild.

Differences in detection rates among guilds at the high and low detectors may reflect varying vertical distribution and habitat preferences of bat species (Hayes 2000). Recent research (Arnett *et al*. 2006) found that small *Myotis* species were more frequently recorded at lower heights while larger species were typically recorded more often at higher heights. In forested habitat, both large and small species were recorded in greater numbers at a medium height of 22 m, rather than at 1.5 m or 44 m. In comparison, the detectors in the project both had similar

species composition. This similarity in composition could be due to deployment in a met tower in an agricultural habitat, which is not the preferred habitat for foraging bats,

Bat activity patterns during migration seem to be related to weather conditions based on mortality studies and acoustic surveys. Acoustic surveys have documented a decrease in bat activity rates as wind speeds increase and temperatures decrease, and bat activity has been shown to correlate negatively to low nightly mean temperatures (Hayes 1997, Reynolds 2006). Similarly, weather factors appeared related to bat collision-mortality rates documented at two facilities in the southeastern United States, with mortality rates negatively correlated with both wind speed and relative humidity, and positively correlated to barometric pressure (Arnett 2005). These patterns suggest that bats are more likely to migrate on nights with low wind speeds (less than 4-6 m/s) and generally favorable weather (warm temperatures, low humidity, high barometric pressure). In general bat activity at both the high and the low detector decreased as the mean nightly temperature decreased.

Overall activity was similar relative to other surveys and appeared to vary by time of night, with a peak in activity occurring around 8:00 p.m. Patterns of bat activity within nights are known to vary, and anywhere from one to several peaks of activity have been documented. Anthony *et al*. (1981) documented that bats appear to leave roosting sites at dusk to forage for a given period, return to their roosts during the middle portion of the night, then forage again later in the evening, closer to dawn.

Results of acoustic surveys must be interpreted with caution. Considerable room for error exists in identification of bats based upon acoustic calls alone, especially if a site or regionally specific library of recorded reference calls is not available. Also, detection rates are not necessarily correlated with the actual numbers of bats in an area, because it is not possible to differentiate among individual bats (Hayes 2000). Stantec can provide a digital file of all acoustic calls, including all information about species identification and timing of calls from each detector on an hourly and nightly basis, should that information be desired.

## 2.4 CONCLUSIONS

Acoustic bat surveys during fall 2007 documented low rates of bat activity. Identification of calls suggested that members of the big brown guild were the most common species at the site during the fall period. Most calls could not be identified properly, due to poor call quality or short duration of calls. Comparison with bat activity levels and weather variables did not identify any strong correlations, although it appeared that bats were more active on warmer nights, which is consistent with results of other bat acoustic surveys in the region.

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# Appendix A

Bat survey results

**Appendix A Table 1**. Summary of acoustic bat data and weather during each survey night at the Ball Hill High detector – Fall 2007

| | | BBSHHB | | | | RBEP | | | MYSP | UNKN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night of | Operated Okay? | big brown bat | hoary bat | silver-haired bat | silver-haired/big brown | eastern pipistrelle | eastern red bat | pipistrelle/red bat | MYSP | high-frequency | low-frequency | unknown | Total | Relative Humidity (%) | Temperature (ºC) |
| 7/30/07 | Y | | | | | | | | 1 | 1 | 2 | | **4** | | |
| 7/31/07 | Y | | 1 | | | | | | | 1 | 1 | | **3** | | |
| 8/1/07 | Y | | | | | | | | | 3 | | | **3** | 59.2 | 23.2 |
| 8/2/07 | Y | | 1 | | | | | | | 1 | | | **2** | 70.5 | 23.3 |
| 8/3/07 | Y | | | | | | | | | 1 | 1 | | **2** | 71.5 | 20.3 |
| 8/4/07 | Y | | | | | | | | 1 | 2 | | | **3** | 57.7 | 17.8 |
| 8/5/07 | Y | | | | | | 1 | | | 3 | 2 | | **6** | 96.4 | 19.5 |
| 8/6/07 | Y | | | | 2 | | | | | | 2 | | **4** | 96.7 | 19.4 |
| 8/7/07 | Y | | | | 1 | | | | | | 2 | | **3** | 96.6 | 22.0 |
| 8/8/07 | Y | | | | | | | 1 | | 4 | | | **5** | 88.1 | 19.3 |
| 8/9/07 | Y | | | | | | 1 | | | 1 | | | **2** | 98.1 | 19.0 |
| 8/10/07 | Y | | | | | | | | | | | | **0** | 85.2 | 18.3 |
| 8/11/07 | Y | | | | | | | | | 1 | 1 | | **2** | 69.7 | 19.5 |
| 8/12/07 | Y | | 1 | | | | | 1 | | | | | **2** | 92.8 | 17.6 |
| 8/13/07 | Y | | | | 2 | | | | 1 | | | | **3** | 67.8 | 16.2 |
| 8/14/07 | Y | | | | | | | | | | 1 | | **1** | 64.1 | 18.7 |
| 8/15/07 | Y | | 1 | | | | 1 | | | 2 | 1 | | **5** | 72.0 | 18.8 |
| 8/16/07 | Y | | | | 1 | | | | | 1 | | | **2** | 67.5 | 18.4 |
| 8/17/07 | Y | | | | | | | | | | | | **0** | 63.3 | 13.5 |
| 8/18/07 | Y | | | | | | | | 1 | | | | **1** | 67.4 | 13.7 |
| 8/19/07 | Y | | | | | | | | | | 1 | | **1** | 88.9 | 13.2 |
| 8/20/07 | Y | | | | | | | | | | | | **0** | 96.4 | 13.2 |
| 8/21/07 | Y | | | | 1 | | | | | 2 | 2 | | **5** | 95.9 | 14.4 |
| 8/22/07 | Y | | | | | | | | | 2 | 3 | | **5** | 95.4 | 20.3 |
| 8/23/07 | Y | | 1 | | 1 | | 1 | | | 1 | 4 | | **8** | 92.5 | 21.4 |
| 8/24/07 | Y | | 1 | | | | | | 1 | 1 | 5 | | **8** | 76.4 | 23.7 |
| 8/25/07 | Y | | | 1 | | | | | 2 | 1 | 1 | | **5** | 94.4 | 16.4 |
| 8/26/07 | Y | | | | 1 | | | | | 2 | | | **3** | 92.7 | 15.7 |
| 8/27/07 | Y | | 1 | | 1 | | | | | 2 | 3 | | **7** | 73.3 | 18.0 |
| 8/28/07 | Y | | 1 | 2 | 2 | | 1 | | | 1 | 11 | | **18** | 79.9 | 19.0 |
| 8/29/07 | Y | | 2 | 1 | 4 | | 1 | | 2 | 2 | 10 | | **22** | 79.5 | 21.4 |
| 8/30/07 | Y | | | 1 | 1 | | | | 2 | 2 | 1 | | **7** | 98.2 | 14.6 |
| 8/31/07 | Y | | | | | | | | 2 | 2 | | | **4** | 75.6 | 15.6 |
| 9/1/07 | Y | | | | | | | | | 2 | | | **2** | 64.8 | 13.0 |
| 9/2/07 | Y | | | | | | | | | | | | **0** | 69.5 | 16.5 |
| 9/3/07 | Y | | | | | | | | | | | | **0** | 70.2 | 17.5 |
| 9/4/07 | Y | | | | | | | | | 1 | | | **1** | 64.9 | 17.5 |
| 9/5/07 | Y | | | 2 | | | | | | | 3 | | **5** | 81.3 | 19.4 |
| 9/6/07 | Y | | 1 | | 2 | | | | | | 2 | | **5** | 70.7 | 22.8 |
| 9/7/07 | Y | | | | 2 | | | | | | | | **2** | 72.7 | 23.3 |
| 9/8/07 | Y | | | 1 | 6 | | | | | 1 | 3 | | **11** | 93.6 | 19.7 |
| 9/9/07 | Y | | 1 | 1 | | | | | | 1 | 3 | | **6** | 99.4 | 16.8 |
| 9/10/07 | Y | | 1 | | 6 | | | | | 1 | 2 | | **10** | 91.2 | 16.9 |
| 9/11/07 | Y | | | | 6 | | | | | | 1 | | **7** | 82.4 | 12.0 |
| 9/12/07 | Y | | | | | | | | | | | | **0** | 91.0 | 9.3 |
| 9/13/07 | Y | | | 1 | 1 | | | | | | 1 | | **3** | 83.0 | 14.0 |
| 9/14/07 | Y | | | | | | | | | 1 | | | **1** | 90.8 | 10.9 |
| 9/15/07 | Y | | | | | | | | | 1 | | | **1** | 69.8 | 7.6 |
| 9/16/07 | Y | | | | | | | | | 1 | | | **1** | 68.9 | 8.2 |
| 9/17/07 | Y | | 1 | | | | | | | | 1 | | **2** | 75.2 | 10.6 |
| 9/18/07 | Y | | | | | | | | | | 1 | | **1** | 77.6 | 13.7 |
| 9/19/07 | Y | | 2 | 1 | 3 | | | | | | | | **6** | 68.0 | 17.9 |
| 9/20/07 | Y | | | | | | | | | | 1 | | **1** | 89.5 | 17.5 |
| 9/21/07 | Y | | | | 1 | | | | | | 5 | | **6** | 78.4 | 19.2 |
| 9/22/07 | Y | | | | | | | | | | | | **0** | 66.3 | 14.2 |
| 9/23/07 | Y | | | | | | | | 1 | | | | **1** | 58.4 | 14.1 |
| 9/24/07 | Y | | 1 | | | | | | | | | | **1** | 61.6 | 16.9 |
| 9/25/07 | Y | | | 2 | 3 | | | | | | 2 | | **7** | 84.6 | 21.3 |
| 9/26/07 | Y | | | 1 | | | | | 1 | | | | **2** | 98.0 | 17.7 |
| 9/27/07 | Y | | | | | | | | | 2 | | | **2** | 99.2 | 13.7 |
| 9/28/07 | Y | | | | | | | | | 1 | | | **1** | 87.1 | 11.0 |
| 9/29/07 | Y | | | 1 | | | | | | | | | **1** | 74.4 | 10.2 |
| 9/30/07 | Y | | | | | | | | | | | | **0** | 71.7 | 14.1 |
| 10/1/07 | Y | | | | | | | | | | | | **0** | 77.4 | 14.9 |
| 10/2/07 | Y | | | | 1 | | | | | | | | **1** | 84.1 | 16.0 |
| 10/3/07 | Y | | | | | | | | | | | | **0** | 94.0 | 15.0 |
| 10/4/07 | Y | | | | | | | | | | 1 | | **1** | 74.8 | 18.0 |
| 10/5/07 | Y | | | | | | | | | 1 | | | **1** | 81.1 | 20.1 |
| 10/6/07 | Y | | | 1 | 1 | | | | | | | | **2** | 89.1 | 20.1 |
| 10/7/07 | Y | | | 1 | | | | | | | 4 | | **5** | 91.7 | 19.8 |
| 10/8/07 | Y | | | 1 | | | | | | | | | **1** | 77.2 | 21.6 |
| 10/9/07 | Y | | | | | | | | | | | | **0** | 83.8 | 10.5 |
| 10/10/07 | Y | | | | | | | | | | | | **0** | 93.3 | 6.8 |
| 10/11/07 | Y | | | | 2 | | | | | | 1 | | **3** | 94.5 | 7.4 |
| 10/12/07 | Y | | | | | | | | | | | | **0** | 83.2 | 6.1 |
| 10/13/07 | Y | | | | | | | | | | | | **0** | 77.6 | 8.0 |
| 10/14/07 | Y | | | | | | | | | | | | **0** | 57.0 | 17.3 |
| **By Species** | | **0** | **17** | **18** | **51** | **0** | **6** | **2** | **15** | **52** | **85** | **0** | **246** | | |
| **By Guild** | | **86** | | | | **8** | | | **15** | **137** | | | | | |
| | | **BBSHHB** | | | | **RBEP** | | | **MYSP** | **UNKN** | | | **Total** | | |

n/o - indicates that detector was not operating on that night

**Appendix A Table 2**. Summary of acoustic bat data and weather during each survey night at the Ball Hill Low detector – Fall 2007

| | | BBSHHB | | | | RBEP | | | MYSP | UNKN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night of | Operated Okay? | big brown bat | hoary bat | silver-haired bat | silver-haired/big bro | eastern pipistrelle | eastern red bat | pipistrelle/red bat | MYSP | high-frequency | low-frequency | unknown | Total | Relative Humidity (%) | Temperature (ºC) |
| 7/30/07 | Y | | | | | | | | | 1 | 1 | | **2** | | |
| 7/31/07 | Y | | 1 | | | | | | | | 3 | | **4** | | |
| 8/1/07 | Y | | | | | | | | | | | | **0** | 59.2 | 23.2 |
| 8/2/07 | Y | | 1 | | | | | | | 1 | 1 | | **3** | 70.5 | 23.3 |
| 8/3/07 | Y | | | | | | | | 1 | | 3 | | **4** | 71.5 | 20.3 |
| 8/4/07 | Y | | | | | | | | 1 | | 1 | | **2** | 57.7 | 17.8 |
| 8/5/07 | Y | | | | | | 1 | | | 2 | 2 | | **5** | 96.4 | 19.5 |
| 8/6/07 | Y | | | | | | | | | | 2 | | **2** | 96.7 | 19.4 |
| 8/7/07 | Y | | | | 1 | | | | | 1 | | | **2** | 96.6 | 22.0 |
| 8/8/07 | Y | | | | | 1 | 1 | | | 3 | | | **5** | 88.1 | 19.3 |
| 8/9/07 | Y | | | | | | | | | 1 | | | **1** | 98.1 | 19.0 |
| 8/10/07 | Y | | | | | | | | | 2 | | | **2** | 85.2 | 18.3 |
| 8/11/07 | Y | | | | | | | | 1 | | | 1 | **2** | 69.7 | 19.5 |
| 8/12/07 | Y | | 1 | | | | | | | 2 | | | **3** | 92.8 | 17.6 |
| 8/13/07 | Y | | | | 1 | | 1 | | | 3 | 1 | | **6** | 67.8 | 16.2 |
| 8/14/07 | Y | | | | | | | | | 1 | | | **1** | 64.1 | 18.7 |
| 8/15/07 | Y | | | | | | | | | 2 | 1 | | **3** | 72.0 | 18.8 |
| 8/16/07 | Y | 1 | | | | | | | 1 | 1 | | | **3** | 67.5 | 18.4 |
| 8/17/07 | Y | | | | | | | | | 1 | | | **1** | 63.3 | 13.5 |
| 8/18/07 | Y | | | | | | 1 | | | 1 | | | **2** | 67.4 | 13.7 |
| 8/19/07 | Y | | | | | | | | | | 1 | | **1** | 88.9 | 13.2 |
| 8/20/07 | Y | | 1 | | | | | | | 1 | 1 | | **3** | 96.4 | 13.2 |
| 8/21/07 | Y | | | | | | 1 | | | 1 | 1 | | **3** | 95.9 | 14.4 |
| 8/22/07 | Y | | | | 1 | | | | | 1 | 1 | | **3** | 95.4 | 20.3 |
| 8/23/07 | Y | | | | 1 | | | | | 1 | 3 | | **5** | 92.5 | 21.4 |
| 8/24/07 | Y | | | | 1 | | | | | | 2 | | **3** | 76.4 | 23.7 |
| 8/25/07 | Y | | | | | | 1 | | 1 | 2 | 3 | | **7** | 94.4 | 16.4 |
| 8/26/07 | Y | | | | | | | 1 | | 1 | | | **2** | 92.7 | 15.7 |
| 8/27/07 | Y | | | | 2 | | | | | 1 | 1 | | **4** | 73.3 | 18.0 |
| 8/28/07 | Y | | | 6 | 1 | | 2 | | 1 | 3 | 2 | | **15** | 79.9 | 19.0 |
| 8/29/07 | Y | | | 3 | | | 1 | 1 | | 2 | 5 | | **12** | 79.5 | 21.4 |
| 8/30/07 | Y | | | | 2 | | 1 | | | 3 | | | **6** | 98.2 | 14.6 |
| 8/31/07 | Y | | | | | | | | 1 | 1 | | | **2** | 75.6 | 15.6 |
| 9/1/07 | Y | | | | | | | | | 3 | | | **3** | 64.8 | 13.0 |
| 9/2/07 | Y | | 1 | | | | | | | | 1 | | **2** | 69.5 | 16.5 |
| 9/3/07 | Y | | | | 1 | | | | | | | | **1** | 70.2 | 17.5 |
| 9/4/07 | Y | | | | | | | | | 1 | 2 | | **3** | 64.9 | 17.5 |
| 9/5/07 | Y | | | 3 | | | 1 | | | 1 | 5 | | **10** | 81.3 | 19.4 |
| 9/6/07 | Y | | 1 | 1 | 3 | | | | | | 2 | | **7** | 70.7 | 22.8 |
| 9/7/07 | Y | | 1 | | 4 | | | | 1 | | 4 | | **10** | 72.7 | 23.3 |
| 9/8/07 | Y | | | 1 | 3 | | | | | 1 | 1 | | **6** | 93.6 | 19.7 |
| 9/9/07 | Y | | 1 | 1 | 7 | | | | | 1 | 1 | | **11** | 99.4 | 16.8 |
| 9/10/07 | Y | | 1 | 2 | 5 | | | 1 | | | 9 | | **18** | 91.2 | 16.9 |
| 9/11/07 | Y | | | | 3 | | | 1 | | | 3 | | **7** | 82.4 | 12.0 |
| 9/12/07 | Y | | | | | | 1 | | | 1 | | | **2** | 91.0 | 9.3 |
| 9/13/07 | Y | | | 4 | 1 | | | | 1 | | 3 | | **9** | 83.0 | 14.0 |
| 9/14/07 | Y | | | | | | | | | | | | **0** | 90.8 | 10.9 |
| 9/15/07 | Y | | | | | | | | | | | | **0** | 69.8 | 7.6 |
| 9/16/07 | Y | | | | | | | | 1 | 2 | | | **3** | 68.9 | 8.2 |
| 9/17/07 | Y | | 1 | | | | | | | 4 | 1 | | **6** | 75.2 | 10.6 |
| 9/18/07 | Y | | 1 | | | | | | | | 3 | | **4** | 77.6 | 13.7 |
| 9/19/07 | Y | | 1 | 3 | 6 | | | | | | | | **10** | 68.0 | 17.9 |
| 9/20/07 | Y | | | | 4 | | 1 | 1 | | 1 | 2 | | **9** | 89.5 | 17.5 |
| 9/21/07 | Y | | | 7 | 4 | | | | | | 9 | | **20** | 78.4 | 19.2 |
| 9/22/07 | Y | | | | 2 | | | | | 2 | | | **4** | 66.3 | 14.2 |
| 9/23/07 | Y | | | | 1 | | | | 1 | | | | **2** | 58.4 | 14.1 |
| 9/24/07 | Y | | | | 1 | | | | | 1 | | | **2** | 61.6 | 16.9 |
| 9/25/07 | Y | | | 1 | 1 | | | | | 1 | 3 | | **6** | 84.6 | 21.3 |
| 9/26/07 | Y | | | | | | | | | 1 | | | **1** | 98.0 | 17.7 |
| 9/27/07 | Y | | 1 | | | | | | | 1 | | | **2** | 99.2 | 13.7 |
| 9/28/07 | Y | | | | | | | | | | | | **0** | 87.1 | 11.0 |
| 9/29/07 | Y | | | 1 | | | | | | | | | **1** | 74.4 | 10.2 |
| 9/30/07 | Y | | | | | | | | | 1 | 1 | | **2** | 71.7 | 14.1 |
| 10/1/07 | Y | | | | 1 | | | | | 1 | | | **2** | 77.4 | 14.9 |
| 10/2/07 | Y | | | | | | | | | | | | **0** | 84.1 | 16.0 |
| 10/3/07 | Y | | | | | | | | | | | | **0** | 94.0 | 15.0 |
| 10/4/07 | Y | | | | | | | | | | | | **0** | 74.8 | 18.0 |
| 10/5/07 | Y | | | | | | | | | | | | **0** | 81.1 | 20.1 |
| 10/6/07 | Y | | | 1 | 3 | | | | | | 1 | | **5** | 89.1 | 20.1 |
| 10/7/07 | Y | | | | 2 | | | | | | 3 | | **5** | 91.7 | 19.8 |
| 10/8/07 | Y | | | | 1 | | | | | | | | **1** | 77.2 | 21.6 |
| 10/9/07 | Y | | | | | | | | | | | | **0** | 83.8 | 10.5 |
| 10/10/07 | Y | | | | | | | | | | | | **0** | 93.3 | 6.8 |
| 10/11/07 | Y | | | | | | | | | | 2 | | **2** | 94.5 | 7.4 |
| 10/12/07 | Y | | | | | | | | | | | | **0** | 83.2 | 6.1 |
| 10/13/07 | Y | | | | | | | | | | | | **0** | 77.6 | 8.0 |
| 10/14/07 | Y | | | | | | | | | | | | **0** | 57.0 | 17.3 |
| **By Species** | | **1** | **13** | **34** | **63** | **1** | **13** | **5** | **11** | **62** | **91** | **1** | **295** | | |
| **By Guild** | | **111** | | | | **19** | | | **11** | **154** | | | **295** | | |
| | | **BBSHHB** | | | | **RBEP** | | | **MYSP** | **UNKN** | | | **Total** | | |

n/o - indicates that detector was not operating on that night

| **Appendix A Table 3.** Summary of available fall bat detector survey results | | | |
|---|---|---|---|
| **Project Site** | **Landscape** | **Calls Per Detector Night** | **Citation** |
| **Fall 2004** | | | |
| Prattsburgh, Steuben County, NY | Agricultural plateau | 2.22 | Woodlot 2005b |
| Cohocton, Steuben County, NY | Agricultural plateau | 2.00 | Woodlot 2005b |
| Sheffield, Caledonia County, VT | Forested ridge | 1.76 | Woodlot 2006a |
| Franklin, Pendleton County, WV | Forested ridge | 9.24 | Woodlot 2005a |
| **Fall 2005** | | | |
| Churubusco, Clinton County, NY | Great Lakes plain/ADK foothills | 5.56 | Woodlot 2005l |
| Clayton, Jefferson County, NY | Agricultural plateau | 4.70 | Woodlot 2005m |
| Sheldon, Wyoming County, NY | Agricultural plateau | 34.92 | Woodlot 2005n |
| Howard, Steuben County, NY | Agricultural plateau | 31.06 | Woodlot 2006o |
| Cohocton, Steuben County, NY | Agricultural plateau | 1.57 | Woodlot 2006c |
| Fairfield, Herkimer County, NY | Agricultural plateau | 1.70 | Woodlot 2005p |
| Jordanville, Herkimer County, NY | Agricultural plateau | 4.79 | Woodlot 2005q |
| Munnsville, Madison County, NY | Agricultural plateau | 2.32 | Woodlot 2005r |
| Sheffield, Caledonia County, VT | Forested ridge | 1.18 | Woodlot 2006a |
| Deerfield, Bennington County, VT | Forested ridge | 0.52 | Woodlot 2005s |
| Redington, Franklin County, ME | Forested ridge | 4.20 | Woodlot 2005u |
| Mars Hill, Aroostook County, ME | Forested ridge | 0.83 | Woodlot 2005t |
| **Fall 2006** | | | |
| Chateaugay, Clinton County, NY | Agricultural plateau | 5.10 | Woodlot 2006j |
| Brandon, Franklin County, NY | Agricultural plateau | 13.10 | Woodlot 2006j |
| Wethersfield, Wyoming County, NY | Agricultural plateau | 0.30 | Woodlot 2006l |
| Centerville, Allegany County, NY | Agricultural plateau | 0.06 | Woodlot 2006l |
| Sheffield, Caledonia County, VT | Forested ridge | 1.10 | Woodlot 2006a |
| Lempster, Sullivan County, NH | Forested ridge | 3.47 | Woodlot 2007a |
| Kibby, Franklin County, ME | Forested ridge | 0.20 | Woodlot 2006m |
| Stetson, Penobscot County, ME | Forested ridge | 2.60 | Woodlot 2007b |

# D Bird Data (BBA, BBS, CBC) Tables

**Table D-1 Bird Species and Their Breeding Status in New York State Breeding Bird Atlas Blocks in the Ball Hill Project Area**

| Common Name | Listed Species | Block | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1569A | 1570A | 1570B | 1570C | 1570D | 1571C | 1571D |
| Canada Goose | | C | C | C | C | C | C | C |
| Mute Swan | | - | - | - | - | PR | - | - |
| Wood Duck | | - | PO | - | PO | - | - | C |
| Mallard | | PO | - | PO | PR | - | PR | C |
| Hooded Merganser | | - | - | - | PR | PO | - | - |
| Common Merganser | | - | - | - | - | PO | - | - |
| Ring-necked Pheasant | | - | - | - | - | - | - | PR |
| Ruffed Grouse | | - | - | - | - | - | - | PO |
| Wild Turkey | | - | PO | - | - | PR | PR | C |
| Great Blue Heron | | PO | PO | - | PO | PO | PO | PO |
| Green Heron | | PO | - | PO | - | - | PO | PO |
| Turkey Vulture | | PO | PO | PO | PO | PO | PO | PO |
| Northern Harrier | T | PO | - | - | - | - | - | - |
| Cooper's Hawk | SC | PO | - | - | - | - | - | - |
| Northern Goshawk | SC | - | - | PO | - | - | - | - |
| Red-shouldered Hawk | SC | - | PO | - | - | - | - | - |
| Broad-winged Hawk | | - | PO | - | - | - | - | - |
| Red-tailed Hawk | | PO | PR | PR | PR | PO | PO | PR |
| American Kestrel | | C | PR | PR | PR | PR | PO | PR |
| Sora | | - | - | - | - | - | - | PO |
| Killdeer | | PR | PR | PO | - | PO | PO | C |
| Spotted Sandpiper | | - | - | - | - | PO | - | PR |
| American Woodcock | | PR | PO | PR | - | PR | - | - |
| Rock Pigeon | | C | C | C | C | PO | - | PR |
| Mourning Dove | | PR | PR | C | PR | PR | PR | C |
| Black-billed Cuckoo | | - | - | - | PO | - | - | - |
| Yellow-billed Cuckoo | | - | - | - | PR | - | - | - |
| Barred Owl | | - | - | - | - | - | - | PR |
| Chimney Swift | | - | PO | PO | - | - | PO | - |

**Table D-1 Bird Species and Their Breeding Status in New York State Breeding Bird Atlas Blocks in the Ball Hill Project Area**

| Common Name | Listed Species | Block | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1569A | 1570A | 1570B | 1570C | 1570D | 1571C | 1571D |
| Ruby-throated Hummingbird | | PR | PR | PR | PO | - | PR | PO |
| Belted Kingfisher | | - | PO | - | PO | PO | - | PO |
| Red-bellied Woodpecker | | - | - | - | - | PO | - | - |
| Yellow-bellied Sapsucker | | PR | PR | - | C | C | - | PO |
| Downy Woodpecker | | PO | PR | PO | PO | PR | PO | C |
| Hairy Woodpecker | | PO | - | PO | PO | PR | - | - |
| Northern Flicker | | PR | PR | PR | PR | C | PO | PR |
| Pileated Woodpecker | | - | PO | - | C | - | - | PO |
| Eastern Wood-Pewee | | PR | PO | PR | PO | PR | PO | PO |
| Acadian Flycatcher | | - | - | - | PR | PR | - | - |
| Alder Flycatcher | | PR | PO | PR | - | PR | - | PO |
| Willow Flycatcher | | PR | PO | PO | PO | - | PR | - |
| Least Flycatcher | | PR | PO | PR | PR | - | - | - |
| Eastern Phoebe | | PR | PR | PO | PR | PR | PO | PR |
| Great Crested Flycatcher | | - | PO | PR | PO | PO | PO | - |
| Eastern Kingbird | | PR | PO | C | PR | PR | PO | PR |
| Blue-headed Vireo | | PR | PO | - | PR | PR | - | - |
| Warbling Vireo | | PR | PR | PR | PR | PR | PO | PO |
| Red-eyed Vireo | | PR | PO | PR | PR | PR | PO | PO |
| Blue Jay | | PR | PR | PR | PR | PR | PR | C |
| American Crow | | C | PR | C | C | C | PR | PR |
| Horned Lark | SC | PR | - | - | - | - | - | - |
| Purple Martin | | - | C | - | PO | - | - | C |
| Tree Swallow | | C | C | C | C | C | - | C |
| Northern Rough-winged Swallow | | - | - | PO | - | - | PO | PO |
| Bank Swallow | | - | - | - | PO | - | - | - |
| Cliff Swallow | | - | PR | - | - | - | - | - |
| Barn Swallow | | C | C | C | C | C | PR | C |

**Table D-1 Bird Species and Their Breeding Status in New York State Breeding Bird Atlas Blocks in the Ball Hill Project Area**

| Common Name | Listed Species | Block | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1569A | 1570A | 1570B | 1570C | 1570D | 1571C | 1571D |
| Black-capped Chickadee | | PR | PR | PR | PR | PR | PR | PR |
| Tufted Titmouse | | - | PR | PO | PR | C | PO | - |
| Red-breasted Nuthatch | | - | PO | - | - | - | - | - |
| White-breasted Nuthatch | | PO | PR | PR | - | - | PO | - |
| Carolina Wren | | - | PO | - | - | - | - | - |
| House Wren | | PR | PR | PR | C | PR | PR | C |
| Golden-crowned Kinglet | | - | - | PO | - | - | - | - |
| Eastern Bluebird | | PO | C | - | PR | PR | C | C |
| Veery | | PO | PR | PR | PO | PR | PO | PO |
| Wood Thrush | | PR | PR | PO | PR | PR | PR | PR |
| American Robin | | C | C | PR | C | C | C | C |
| Gray Catbird | | PR | PR | C | PR | C | PR | PR |
| Northern Mockingbird | | - | - | - | - | - | PO | - |
| Brown Thrasher | | - | PR | PO | - | - | - | PO |
| European Starling | | C | C | C | C | C | C | C |
| Cedar Waxwing | | PR | PR | PR | PO | PO | PR | PR |
| Blue-winged Warbler | | - | PR | PO | PR | PR | - | - |
| Yellow Warbler | | PR | C | PO | PR | C | PR | PR |
| Chestnut-sided Warbler | | PR | PR | C | - | PR | PO | PO |
| Magnolia Warbler | | - | PR | PO | PO | PR | - | - |
| Yellow-rumped Warbler | | - | PR | PR | PO | - | - | - |
| Black-throated Green Warbler | | - | PO | - | PR | PO | - | - |
| Blackburnian Warbler | | - | - | PO | PO | PO | - | - |
| American Redstart | | PR | PR | C | PR | PR | PO | PR |
| Ovenbird | | PR | PO | PR | PO | PO | - | PR |
| Northern Waterthrush | | - | - | - | PO | - | - | - |
| Mourning Warbler | | PO | - | PR | PO | PR | - | - |
| Common Yellowthroat | | PR | PR | C | PR | PR | PO | PR |
| Hooded Warbler | | PR | PR | PR | PR | C | PO | PO |

**Table D-1 Bird Species and Their Breeding Status in New York State Breeding Bird Atlas Blocks in the Ball Hill Project Area**

| Common Name | Listed Species | Block | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1569A | 1570A | 1570B | 1570C | 1570D | 1571C | 1571D |
| Canada Warbler | | - | - | - | PO | PO | - | - |
| Scarlet Tanager | | PR | PR | PO | PO | PR | PO | PO |
| Eastern Towhee | | PR | PR | PR | PO | - | - | - |
| Chipping Sparrow | | C | PR | C | PR | PR | PO | PR |
| Field Sparrow | | - | PR | PR | PO | PR | PR | PO |
| Savannah Sparrow | | PR | PR | C | PO | - | - | PR |
| Song Sparrow | | PR | PR | C | PR | C | PR | PR |
| Swamp Sparrow | | PR | PR | - | PR | PR | - | - |
| White-throated Sparrow | | - | - | - | - | - | - | PO |
| Dark-eyed Junco | | - | PR | - | PR | PR | PR | - |
| Northern Cardinal | | PR | PR | PR | PR | PR | PR | PR |
| Rose-breasted Grosbeak | | PR | PR | PR | PR | PR | PO | PO |
| Indigo Bunting | | PR | PR | C | PR | PR | PO | PO |
| Bobolink | | C | PR | C | PO | PR | PO | PR |
| Red-winged Blackbird | | C | PR | PO | C | C | PR | PR |
| Eastern Meadowlark | | PR | PR | PR | - | PR | PR | PR |
| Common Grackle | | C | PR | C | PR | C | C | C |
| Brown-headed Cowbird | | PR | PR | PO | PO | PR | PO | PR |
| Baltimore Oriole | | PR | PO | C | PO | PR | PR | C |
| Purple Finch | | PR | PO | PO | PR | - | PO | PO |
| House Finch | | PR | PR | - | - | PO | C | C |
| American Goldfinch | | PR | PR | PR | PR | PR | PO | PR |
| House Sparrow | | C | C | C | C | C | C | C |

**Table D-1 Bird Species and Their Breeding Status in New York State Breeding Bird Atlas Blocks in the Ball Hill Project Area**

| Common Name | Listed Species | Block | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1569A | 1570A | 1570B | 1570C | 1570D | 1571C | 1571D |
| **Number of Species Reported as** | | | | | | | | |
| **Possible Breeders** | | 13 | 24 | 23 | 29 | 17 | 32 | 24 |
| **Probable Breeders** | | 42 | 47 | 28 | 36 | 40 | 21 | 27 |
| **Confirmed Breeders** | | 13 | 10 | 20 | 12 | 16 | 7 | 19 |
| **Species Total** | | 68 | 81 | 71 | 77 | 73 | 60 | 70 |
| **Collective Species Total** | 109 | | | | | | | |

Source: New York State Breeding Bird Atlas 2000

Key :

C = Confirmed.
E = Endangered (NY).
PO = Possible.
PR = Probable.
SC = Special Concern (NY).
T = Threatened (NY).

**Table D-2 Bird Species Recorded During Cattaraugus, Randolph, Sheridan, and Nashville Breeding Bird Surveys**

| Common Name | Listed Species | Birds per Route | | | |
|---|---|---|---|---|---|
| | | Cattaraugus | Randolph | Sheridan | Nashville |
| Canada Goose | | 7.19 | 0.81 | - | 3.15 |
| Wood Duck | | 1.28 | 0.16 | 0.19 | 0.09 |
| American Black Duck | | - | 0.03 | 0.06 | - |
| Mallard | | 1.31 | 0.38 | 1.03 | 1.62 |
| Blue-winged Teal | | 0.06 | - | 0.06 | - |
| Hooded Merganser | | 0.25 | - | - | - |
| Common Merganser | | 0.06 | - | - | 0.03 |
| Ring-necked Pheasant | | 0.03 | 0.03 | 0.59 | 0.94 |
| Ruffed Grouse | | 0.09 | 0.05 | 0.03 | 0.09 |
| Wild Turkey | | 0.53 | 1.24 | 0.34 | 0.53 |
| American Bittern | SC | 0.22 | 0.03 | - | 0.03 |
| Great Blue Heron | | 1.78 | 1.62 | 1.50 | 1.29 |
| Green Heron | | 0.66 | 0.62 | 0.56 | 0.62 |
| Black-crowned Night Heron | | - | - | 0.06 | - |
| Turkey Vulture | | 0.19 | 0.78 | 0.53 | 0.85 |
| Northern Harrier | T | - | 0.16 | 0.09 | 0.09 |
| Sharp-shinned Hawk | SC | 0.09 | 0.05 | 0.06 | 0.06 |
| Cooper's Hawk | SC | 0.19 | 0.08 | - | 0.09 |
| Northern Goshawk | SC | 0.03 | - | - | - |
| Red-shouldered Hawk | SC | 0.19 | 0.57 | 0.19 | 0.21 |
| Broad-winged Hawk | | - | 0.05 | 0.06 | - |
| Red-tailed Hawk | | 0.94 | 0.89 | 1.00 | 0.56 |
| American Kestrel | | 1.09 | 0.57 | 1.00 | 1.18 |
| Virginia Rail | | - | 0.03 | - | - |
| Sora | | 0.03 | 0.03 | - | - |
| Killdeer | | 5.69 | 5.54 | 6.47 | 8.91 |
| Spotted Sandpiper | | 0.28 | 0.14 | 0.06 | 0.35 |
| Upland Sandpiper | T | 0.03 | 0.14 | 1.28 | 0.32 |
| Wilson's Snipe | | 0.03 | 0.24 | - | 0.15 |
| American Woodcock | | 0.09 | - | 0.03 | 0.24 |
| Ring-billed Gull | | - | 0.08 | 1.56 | 2.38 |
| Rock Pigeon | | 12.78 | 26.24 | 13.06 | 14.47 |
| Mourning Dove | | 15.16 | 13.41 | 16.03 | 19.32 |
| Black-billed Cuckoo | | 1.50 | 1.11 | 0.75 | 0.38 |
| Yellow-billed Cuckoo | | 0.41 | 0.14 | 0.28 | 0.41 |
| Eastern Screech-Owl | | 0.09 | - | - | 0.09 |

**Table D-2 Bird Species Recorded During Cattaraugus, Randolph, Sheridan, and Nashville Breeding Bird Surveys**

| Common Name | Listed Species | Birds per Route | | | |
|---|---|---|---|---|---|
| | | Cattaraugus | Randolph | Sheridan | Nashville |
| Great Horned Owl | | 0.03 | - | 0.03 | 0.15 |
| Barred Owl | | 0.06 | 0.57 | - | - |
| Chimney Swift | | 3.72 | 2.11 | 3.56 | 0.79 |
| Ruby-throated Hummingbird | | 0.63 | 0.46 | 0.16 | 0.62 |
| Belted Kingfisher | | 1.03 | 0.49 | 0.31 | 0.82 |
| Red-headed Woodpecker | SC | - | 0.14 | 0.09 | 0.21 |
| Red-bellied Woodpecker | | - | - | - | 0.21 |
| Yellow-bellied Sapsucker | | 0.69 | 0.97 | 0.16 | 0.09 |
| Downy Woodpecker | | 1.75 | 1.38 | 2.13 | 0.85 |
| Hairy Woodpecker | | 0.38 | 0.24 | 0.25 | 0.12 |
| Northern Flicker | | 3.78 | 2.11 | 2.44 | 2.79 |
| Pileated Woodpecker | | 0.16 | 0.24 | 0.19 | 0.09 |
| Eastern Wood-Pewee | | 1.31 | 2.62 | 3.41 | 2.50 |
| Acadian Flycatcher | | 0.06 | 0.24 | - | - |
| Alder Flycatcher | | 1.22 | 0.84 | 0.75 | 0.18 |
| Willow Flycatcher | | 1.72 | 1.11 | 3.19 | 5.35 |
| Least Flycatcher | | 3.50 | 2.41 | 2.59 | 2.82 |
| Eastern Phoebe | | 4.75 | 3.68 | 2.31 | 2.91 |
| Great Crested Flycatcher | | 2.00 | 2.16 | 3.25 | 1.76 |
| Eastern Kingbird | | 4.00 | 2.35 | 4.97 | 3.12 |
| Yellow-throated Vireo | | - | 0.03 | 0.03 | 0.15 |
| Blue-headed Vireo | | 0.50 | 0.81 | 0.03 | 0.03 |
| Warbling Vireo | | 1.53 | 1.35 | 2.16 | 5.38 |
| Red-eyed Vireo | | 10.91 | 14.11 | 11.44 | 10.12 |
| Blue Jay | | 7.81 | 6.54 | 6.84 | 4.26 |
| American Crow | | 53.34 | 42.81 | 46.25 | 37.47 |
| Common Raven | | 0.09 | - | - | - |
| Horned Lark | SC | 0.13 | 1.08 | 0.06 | 0.47 |
| Purple Martin | | 0.16 | 2.70 | 1.09 | 10.79 |
| Tree Swallow | | 3.16 | 2.16 | 2.16 | 3.38 |
| Northern Rough-winged Swallow | | 0.50 | 0.22 | 0.72 | 0.50 |
| Bank Swallow | | 0.66 | 5.24 | 0.34 | 7.74 |
| Cliff Swallow | | 1.97 | 5.19 | 1.09 | 3.76 |
| Barn Swallow | | 29.44 | 21.73 | 18.47 | 26.09 |
| Black-capped Chickadee | | 6.00 | 6.70 | 4.13 | 4.21 |
| Tufted Titmouse | | 0.06 | 0.32 | - | 0.18 |

**Table D-2 Bird Species Recorded During Cattaraugus, Randolph, Sheridan, and Nashville Breeding Bird Surveys**

| | Listed | Birds per Route | | | |
|---|---|---|---|---|---|
| Common Name | Species | Cattaraugus | Randolph | Sheridan | Nashville |
| Red-breasted Nuthatch | | 0.28 | 0.08 | - | 0.03 |
| White-breasted Nuthatch | | 0.63 | 0.62 | 0.53 | 0.76 |
| Brown Creeper | | 0.13 | 0.16 | 0.13 | - |
| Carolina Wren | | 0.03 | 0.05 | - | - |
| House Wren | | 8.69 | 7.86 | 12.50 | 9.88 |
| Winter Wren | | 0.09 | 0.05 | 0.06 | - |
| Sedge Wren | T | - | - | - | 0.03 |
| Marsh Wren | | 0.03 | 0.08 | - | - |
| Golden-crowned Kinglet | | 0.06 | 0.24 | 0.31 | - |
| Blue-gray Gnatcatcher | | 0.25 | 0.05 | 0.03 | 0.06 |
| Eastern Bluebird | | 0.78 | 1.27 | 0.63 | 1.15 |
| Veery | | 1.13 | 7.46 | 2.44 | 1.79 |
| Swainson's Thrush | | 0.03 | 0.14 | - | - |
| Hermit Thrush | | 0.34 | 1.41 | 0.03 | 0.79 |
| Wood Thrush | | 10.19 | 11.27 | 10.75 | 9.44 |
| American Robin | | 64.94 | 53.03 | 91.88 | 69.91 |
| Gray Catbird | | 10.16 | 7.65 | 15.59 | 10.62 |
| Northern Mockingbird | | 0.03 | - | - | - |
| Brown Thrasher | | 0.69 | 1.46 | 2.00 | 1.29 |
| European Starling | | 93.59 | 77.84 | 100.84 | 90.71 |
| Cedar Waxwing | | 18.44 | 14.70 | 8.56 | 7.32 |
| Blue-winged Warbler | | 1.69 | 1.16 | 1.31 | 0.47 |
| Golden-winged Warbler | SC | - | 0.05 | - | 0.03 |
| Nashville Warbler | | - | 0.14 | 0.09 | - |
| Yellow Warbler | | 25.56 | 15.65 | 22.44 | 19.62 |
| Chestnut-sided Warbler | | 3.41 | 4.27 | 1.69 | 0.74 |
| Magnolia Warbler | | 0.53 | 3.24 | 0.38 | - |
| Black-throated Blue Warbler | | 0.31 | - | - | - |
| Yellow-rumped Warbler | | 0.31 | 0.46 | 0.03 | 0.09 |
| Black-throated Green Warbler | | 0.78 | 0.54 | 0.97 | 0.44 |
| Blackburnian Warbler | | 1.97 | 3.41 | 0.25 | - |
| Black-and-white Warbler | | 0.03 | 0.03 | - | - |
| American Redstart | | 2.00 | 2.73 | 2.47 | 0.29 |
| Ovenbird | | 2.25 | 5.41 | 2.53 | 2.06 |
| Northern Waterthrush | | - | - | 0.03 | 0.03 |
| Louisiana Waterthrush | | 0.03 | 0.24 | - | - |
| Mourning Warbler | | 2.00 | 2.41 | 1.53 | 0.79 |

**Table D-2 Bird Species Recorded During Cattaraugus, Randolph, Sheridan, and Nashville Breeding Bird Surveys**

| Common Name | Listed Species | Birds per Route | | | |
|---|---|---|---|---|---|
| | | Cattaraugus | Randolph | Sheridan | Nashville |
| Common Yellowthroat | | 17.47 | 15.59 | 16.56 | 11.56 |
| Hooded Warbler | | 0.69 | 0.68 | 0.47 | 0.18 |
| Canada Warbler | | 0.06 | 1.22 | 0.69 | - |
| Yellow-breasted Chat | SC | - | - | 0.03 | - |
| Scarlet Tanager | | 2.03 | 2.38 | 1.75 | 1.50 |
| Eastern Towhee | | 3.53 | 2.97 | 4.38 | 2.41 |
| Chipping Sparrow | | 16.91 | 13.22 | 14.59 | 10.97 |
| Clay-colored Sparrow | | 0.13 | - | - | - |
| Field Sparrow | | 6.66 | 3.84 | 12.69 | 6.32 |
| Vesper Sparrow | SC | 1.22 | 0.92 | 0.16 | 0.85 |
| Savannah Sparrow | | 9.63 | 15.16 | 20.34 | 12.12 |
| Grasshopper Sparrow | SC | 0.44 | 0.19 | 1.06 | 0.71 |
| Henslow's Sparrow | T | - | 0.03 | 0.47 | 0.56 |
| Song Sparrow | | 36.88 | 36.73 | 53.06 | 46.44 |
| Swamp Sparrow | | 1.72 | 3.62 | - | 0.41 |
| Dark-eyed Junco | | 1.50 | 4.51 | 1.66 | 0.18 |
| Northern Cardinal | | 3.53 | 5.86 | 4.38 | 4.09 |
| Rose-breasted Grosbeak | | 2.38 | 4.19 | 4.78 | 2.85 |
| Indigo Bunting | | 11.22 | 10.78 | 9.59 | 4.21 |
| Bobolink | | 5.13 | 15.97 | 20.97 | 15.68 |
| Red-winged Blackbird | | 106.38 | 92.19 | 167.75 | 101.74 |
| Eastern Meadowlark | | 5.59 | 7.19 | 15.81 | 14.00 |
| Common Grackle | | 39.50 | 30.76 | 52.56 | 43.91 |
| Brown-headed Cowbird | | 4.88 | 7.32 | 9.31 | 6.65 |
| Baltimore Oriole | | 5.88 | 4.62 | 6.88 | 4.76 |
| Purple Finch | | 1.00 | 1.19 | 1.06 | 0.26 |
| House Finch | | 3.69 | 3.68 | 3.72 | 2.65 |
| Red Crossbill | | - | 0.05 | - | - |
| American Goldfinch | | 16.22 | 19.76 | 21.16 | 21.79 |
| House Sparrow | | 12.91 | 36.68 | 38.28 | 53.62 |

Source: Sauer et al. 2008.

Key:
E = Endangered (NY).
SC = Species of Special Concern (NY).
T = Threatened (NY).

**Table D-3 Species Recorded During the Last 11 Years of the Dunkirk-Fredonia Christmas Bird Count (1997-2007)[1]**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Snow Goose | | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| Canada Goose | | 2,046 | 847 | 939 | 1,625 | 3,280 | 477 | 593 | 365 | 1,136 | 1,439 | 1,510 | 12,897 |
| Mute Swan | | - | - | - | - | 6 | - | - | - | - | - | - | 6 |
| Trumpeter Swan | | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Tundra Swan | | 12 | - | - | - | 245 | 3 | - | - | - | - | - | 260 |
| Wood Duck | | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| Gadwall | | - | 1 | - | - | 13 | - | - | - | - | - | - | 14 |
| American Black Duck | | 57 | 1 | 4 | 51 | 53 | 4 | 7 | 13 | 14 | - | 33 | 237 |
| Mallard | | 492 | 140 | 409 | 163 | 401 | 249 | 202 | 152 | 45 | 49 | 457 | 2,759 |
| Northern Shoveler | | - | - | - | - | - | - | - | 2 | - | - | - | 2 |
| Green-winged Teal | | 1 | - | - | - | 2 | - | - | - | - | - | - | 3 |
| Canvasback | | 15 | 2 | 3 | 51 | 5 | 28 | 1 | 14 | 20 | 1 | 8 | 148 |
| Redhead | | 7 | 1 | 4 | 20 | 11 | - | - | - | 2 | - | 28 | 73 |
| Ring-necked Duck | | - | - | - | - | - | - | - | - | 1 | 2 | - | 3 |
| Greater Scaup | | 5 | 3 | 3 | 58 | - | 15 | 4 | 4 | 35 | 10 | 35 | 172 |
| Lesser Scaup | | - | - | - | 2 | 6 | - | - | 1 | - | 1 | 57 | 67 |
| Harlequin Duck | | 2 | - | - | - | - | - | - | - | - | - | - | 2 |
| Long-tailed Duck | | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| Bufflehead | | 66 | 130 | 90 | 129 | 41 | 29 | 44 | 31 | 19 | 26 | 57 | 662 |
| Common Goldeneye | | 61 | 14 | 116 | 12 | 19 | 1 | - | 5 | 3 | 6 | 2 | 239 |
| Hooded Merganser | | 11 | 4 | 2 | 14 | 39 | 21 | 45 | 4 | 17 | 27 | 54 | 238 |
| Common Merganser | | 84 | 466 | 41 | 49 | 25 | 46 | 41 | 15 | 63 | 29 | 90 | 949 |
| Red-breasted Merganser | | 20 | 17 | 12 | 45 | - | 6 | 12 | 3 | - | 7 | 2 | 124 |
| Ruddy Duck | | 1 | - | - | - | 6 | 2 | - | - | 2 | 2 | - | 13 |
| Ring-necked Pheasant | | - | - | 2 | - | 1 | 0 | 1 | 1 | - | 5 | - | 10 |

**Table D-3 Species Recorded During the Last 11 Years of the Dunkirk-Fredonia Christmas Bird Count (1997-2007)[1]**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Wild Turkey | | 94 | 75 | 26 | 23 | 14 | 100 | 58 | 98 | 173 | 49 | - | 710 |
| Common Loon | SC | - | - | - | - | 1 | - | 1 | - | - | - | - | 2 |
| Pied-billed Grebe | T | 9 | 1 | 8 | 2 | 2 | 3 | 6 | 8 | 3 | 1 | 1 | 44 |
| Horned Grebe | | 9 | 1 | 1 | 8 | 1 | 4 | 3 | 1 | 2 | 5 | 19 | 54 |
| Eared Grebe | | - | - | - | - | - | 0 | - | - | - | - | - | 0 |
| Double-crested Cormorant | | - | 4 | 65 | 80 | 189 | 66 | 98 | 138 | 81 | 139 | 78 | 938 |
| Great Blue Heron | | - | - | 1 | 1 | 8 | - | 1 | 1 | 3 | - | 2 | 17 |
| Black-crowned Night-Heron | | - | - | - | - | - | - | - | 0 | - | - | - | 0 |
| Osprey | SC | - | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Bald Eagle | T | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| Northern Harrier | T | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| Sharp-shinned Hawk | SC | 5 | 3 | 5 | 3 | 4 | 0 | 1 | 2 | 1 | - | 1 | 25 |
| Cooper's Hawk | SC | 0 | - | 0 | 2 | 1 | 0 | 3 | 2 | 6 | 1 | 2 | 17 |
| Northern Goshawk | SC | - | - | 0 | - | - | - | - | - | - | - | - | 0 |
| Red-shouldered Hawk | SC | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| Red-tailed Hawk | | 14 | 15 | 20 | 20 | 11 | 9 | 34 | 33 | 9 | 24 | 5 | 194 |
| Rough-legged Hawk | | 2 | 4 | - | 2 | - | 2 | 1 | - | - | 3 | - | 14 |
| American Kestrel | | 1 | 3 | 5 | 3 | 3 | 3 | 6 | 1 | 1 | 4 | - | 30 |
| American Coot | | 43 | 80 | 92 | 64 | 117 | 58 | 18 | 39 | 26 | 119 | - | 656 |
| Sandhill Crane | | - | - | - | - | 12 | - | - | - | - | - | - | 12 |
| Laughing Gull | | - | - | - | - | 0 | - | - | - | - | - | - | 0 |
| Little Gull | | 0 | - | - | - | - | - | - | - | - | - | - | 0 |
| Bonaparte's Gull | | 799 | 600 | 8 | 0 | 207 | 3 | 19 | - | 3 | 5 | 780 | 2,424 |
| Ring-billed Gull | | 1,204 | 2,017 | 1,773 | 3,350 | 2,746 | 2,180 | 1,054 | 390 | 1,388 | 336 | 987 | 17,425 |
| Herring Gull | | 18 | 40 | 27 | 32 | 42 | 48 | 18 | 30 | 69 | 10 | 16 | 350 |

**Table D-3 Species Recorded During the Last 11 Years of the Dunkirk-Fredonia Christmas Bird Count (1997-2007)[1]**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Glaucous Gull | | - | 0 | - | - | - | - | - | - | - | - | - | 0 |
| Great Black-backed Gull | | 31 | 89 | 47 | 94 | 56 | 51 | 53 | 50 | 94 | 72 | 173 | 810 |
| Rock Pigeon | | 193 | 186 | 108 | 154 | 117 | 248 | 321 | 257 | 266 | 181 | 11 | 2,042 |
| Mourning Dove | | 117 | 174 | 137 | 178 | 98 | 126 | 226 | 94 | 87 | 96 | 121 | 1,454 |
| Eastern Screech-Owl | | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Great Horned Owl | | - | 3 | 4 | 0 | - | 2 | - | 1 | 2 | - | - | 12 |
| Barred Owl | | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Belted Kingfisher | | 2 | - | 1 | - | - | 0 | - | 1 | - | 0 | 1 | 5 |
| Red-bellied Woodpecker | | 1 | 5 | 2 | 8 | 9 | 5 | 9 | 7 | 8 | 8 | 15 | 77 |
| Yellow-bellied Sapsucker | | - | 1 | - | - | - | 0 | - | - | - | - | - | 1 |
| Downy Woodpecker | | 29 | 27 | 21 | 46 | 27 | 26 | 23 | 28 | 30 | 25 | 29 | 311 |
| Hairy Woodpecker | | 8 | 4 | 6 | 7 | 8 | 8 | 5 | 11 | 10 | 7 | 4 | 78 |
| Northern Flicker | | 3 | 0 | 12 | 8 | 7 | 7 | 3 | 2 | 2 | 4 | 8 | 56 |
| Pileated Woodpecker | | 2 | 1 | 2 | 2 | - | 2 | 1 | 2 | 2 | - | - | 14 |
| Northern Shrike | | 1 | - | 2 | 3 | - | 1 | 3 | 3 | - | - | - | 13 |
| Blue Jay | | 47 | 103 | 57 | 213 | 58 | 86 | 62 | 49 | 41 | 62 | 33 | 811 |
| American Crow | | 401 | 307 | 254 | 323 | 92 | 205 | 284 | 240 | 627 | 374 | 175 | 3,282 |
| Horned Lark | SC | - | 5 | - | - | - | - | - | - | - | - | - | 5 |
| Black-capped Chickadee | | 98 | 111 | 141 | 95 | 58 | 49 | 107 | 112 | 156 | 105 | 78 | 1,110 |
| Tufted Titmouse | | 11 | 8 | 17 | 11 | 16 | 8 | 13 | 16 | 13 | 9 | 22 | 144 |
| Red-breasted Nuthatch | | 2 | 4 | 12 | 2 | 13 | 3 | 11 | 9 | 1 | 1 | 16 | 74 |
| White-breasted Nuthatch | | 20 | 9 | 21 | 15 | 18 | 13 | 23 | 20 | 25 | 11 | 20 | 195 |
| Carolina Wren | | - | 1 | 0 | 0 | 1 | - | 1 | 1 | 1 | 1 | - | 6 |
| Golden-crowned Kinglet | | 16 | - | - | 2 | - | 0 | - | 3 | - | 3 | - | 24 |
| Eastern Bluebird | | - | 0 | 29 | 13 | 6 | 3 | 8 | 6 | 0 | 10 | 35 | 110 |
| Hermit Thrush | | - | 1 | - | - | 0 | - | - | - | - | - | - | 1 |

**Table D-3 Species Recorded During the Last 11 Years of the Dunkirk-Fredonia Christmas Bird Count (1997-2007)[1]**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| American Robin | | - | 490 | 265 | 11 | 24 | 59 | 31 | 35 | 2 | 23 | 1 | 941 |
| Northern Mockingbird | | - | - | 1 | 0 | - | - | - | - | - | - | - | 1 |
| Brown Thrasher | | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| European Starling | | 1,085 | 794 | 2,253 | 413 | 695 | 439 | 1,559 | 909 | 1,058 | 1,082 | 3,956 | 14,243 |
| American Pipit | | - | 0 | - | - | - | - | - | - | - | - | - | 0 |
| Cedar Waxwing | | 80 | 9 | 19 | 25 | 8 | 1 | 5 | 90 | - | - | 130 | 367 |
| Yellow-rumped Warbler | | - | - | 2 | - | 1 | 10 | - | - | - | - | - | 13 |
| Pine Warbler | | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Eastern Towhee | | - | 1 | - | - | - | 1 | - | - | 1 | - | - | 3 |
| American Tree Sparrow | | 82 | 192 | 45 | 133 | 64 | 37 | 25 | 27 | 34 | 45 | 40 | 724 |
| Chipping Sparrow | | - | - | - | - | 1 | - | - | - | - | - | 2 | 3 |
| Field Sparrow | | 2 | - | - | - | - | - | - | - | - | - | - | 2 |
| Song Sparrow | | 25 | 10 | 0 | 6 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 52 |
| White-throated Sparrow | | 33 | 38 | 0 | 30 | 32 | 10 | 7 | 3 | 16 | 5 | 4 | 178 |
| White-crowned Sparrow | | - | 7 | 4 | 13 | 6 | 2 | 2 | - | 1 | 2 | 3 | 40 |
| Dark-eyed Junco | | 197 | 306 | 158 | 226 | 144 | 111 | 107 | 171 | 103 | 50 | 98 | 1,671 |
| Snow Bunting | | 1 | 1 | - | - | - | - | - | - | - | - | - | 2 |
| Northern Cardinal | | 45 | 71 | 15 | 109 | 80 | 22 | 25 | 40 | 28 | 19 | 27 | 481 |
| Red-winged Blackbird | | - | 1 | - | - | - | - | - | - | - | 3 | - | 4 |
| Common Grackle | | - | - | 2 | - | - | - | 1 | - | - | - | - | 3 |
| Brown-headed Cowbird | | - | 5 | - | - | 1 | - | - | 0 | - | - | 0 | 6 |
| Purple Finch | | - | - | - | 1 | - | 6 | - | 0 | 0 | - | 2 | 9 |
| House Finch | | 168 | 318 | 146 | 155 | 307 | 85 | 34 | 48 | 51 | 17 | 109 | 1,438 |
| Common Redpoll | | - | - | 4 | - | 0 | - | - | - | - | - | 23 | 27 |
| Pine Siskin | | - | - | 1 | - | - | - | - | - | - | - | 3 | 4 |
| American Goldfinch | | 21 | 23 | 38 | 65 | 34 | 22 | 87 | 38 | 33 | 17 | 61 | 439 |

**Table D-3 Species Recorded During the Last 11 Years of the Dunkirk-Fredonia Christmas Bird Count (1997-2007)[1]**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Evening Grosbeak | | 8 | - | - | - | - | - | - | - | - | - | - | 8 |
| House Sparrow | | 202 | 233 | 207 | 157 | 156 | 198 | 119 | 240 | 162 | 49 | 102 | 1,825 |
| **Total Birds** | | **8,009** | **8,010** | **7,689** | **8,330** | **9,651** | **5,208** | **5,427** | **3,868** | **5,977** | **4,583** | **9,523** | **76,275** |
| **Species Total** | | **58** | **65** | **62** | **62** | **65** | **64** | **55** | **59** | **55** | **55** | **59** | **104** |

Source: National Audubon Society 2007

Note :
[1] Zeros in the table indicate that a species was observed during the week of the Christmas Bird Count but not officially observed on the day of the count.

Key:

E = Endangered (NY).
SC = Special Concern (NY).
T = Threatened (NY).

**Table D-4 Species Recorded During the Last 11 Years of the Jamestown Christmas Bird Count (1996-2007, Excluding 2002 When Surveys were not Conducted)**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Canada Goose | | 2,077 | 651 | 2,917 | 1,819 | 809 | 1,591 | 1,586 | 913 | 678 | 1,375 | 749 | 15,165 |
| Mute Swan | | - | - | - | - | - | - | - | 2 | - | - | - | 2 |
| Trumpeter Swan | | - | - | - | - | - | - | - | - | 1 | - | - | 1 |
| Tundra Swan | | 47 | 21 | 38 | 137 | 6 | 23 | 120 | 89 | 63 | 238 | - | 782 |
| Wood Duck | | 4 | 3 | 6 | 6 | 1 | 3 | 2 | 0 | 5 | 2 | 1 | 33 |
| Gadwall | | - | - | 59 | 65 | 7 | 105 | - | 1 | - | 2 | - | 239 |
| American Wigeon | | 1 | - | 8 | 25 | - | 50 | - | 4 | - | 2 | - | 90 |
| American Black Duck | | 12 | 48 | 37 | 15 | 9 | 18 | 36 | 5 | 18 | 11 | 7 | 216 |
| Mallard | | 1,007 | 767 | 1,032 | 731 | 597 | 823 | 596 | 437 | 947 | 632 | 594 | 8,163 |
| Northern Shoveler | | - | - | 25 | 20 | - | 36 | 16 | 12 | - | 40 | - | 149 |
| Northern Pintail | | - | 1 | 11 | - | - | 1 | 4 | 0 | - | 18 | - | 35 |
| Green-winged Teal | | - | 2 | 6 | 1 | 1 | 8 | - | - | - | - | - | 18 |
| Canvasback | | 5 | 3 | 3 | 6 | - | 2 | - | - | 1 | 50 | - | 70 |
| Redhead | | 20 | 1 | 1 | 230 | - | - | - | - | 10 | 458 | - | 720 |
| Ring-necked Duck | | - | 3 | 13 | 4 | - | 64 | 2 | 32 | 7 | 48 | - | 173 |
| Greater Scaup | | 1 | 40 | 2 | 12 | - | 10 | - | - | 5 | 81 | - | 151 |
| Lesser Scaup | | 75 | 2 | - | - | - | - | - | 10 | - | 241 | - | 328 |
| Surf Scoter | | - | - | 1 | - | - | - | - | - | - | - | - | 1 |
| Long-tailed Duck | | - | - | - | 1 | - | - | - | - | 1 | - | - | 2 |
| Bufflehead | | 8 | 20 | 125 | 42 | 16 | 88 | 45 | 24 | 2 | 55 | 13 | 438 |
| Common Goldeneye | | 6 | 38 | 327 | 192 | 117 | 201 | 326 | 49 | 48 | 618 | 22 | 1,944 |
| Hooded Merganser | | 5 | 6 | 1,609 | 367 | 32 | 1,105 | 7 | 414 | 13 | 584 | 14 | 4,156 |
| Common Merganser | | 421 | 9 | 2,215 | 731 | 340 | 1,551 | 51 | 143 | 9 | 1,002 | 39 | 6,511 |
| Red-breasted Merganser | | - | - | - | 60 | - | 3 | 3 | 1 | - | - | - | 67 |

**Table D-4 Species Recorded During the Last 11 Years of the Jamestown Christmas Bird Count (1996-2007, Excluding 2002 When Surveys were not Conducted)**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Ruddy Duck | | - | 1 | 1 | 180 | - | 10 | 2 | - | 6 | 105 | 1 | 306 |
| Ring-necked Pheasant | | 2 | 6 | 9 | 10 | 4 | 0 | 4 | 6 | 7 | 2 | 7 | 57 |
| Ruffed Grouse | | 3 | 4 | 3 | - | 2 | 1 | - | 2 | 2 | - | - | 17 |
| Wild Turkey | | 40 | 49 | 48 | 70 | 14 | 82 | 158 | 79 | 60 | 5 | 122 | 727 |
| Common Loon | SC | 0 | - | 4 | - | - | - | - | 1 | - | 0 | - | 5 |
| Pied-billed Grebe | T | - | 23 | 2 | 6 | 2 | 27 | - | 1 | 2 | 4 | - | 67 |
| Horned Grebe | | - | - | 2 | - | - | - | - | 1 | - | 2 | - | 5 |
| Double-crested Cormorant | | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| Great Blue Heron | | 18 | 19 | 18 | 11 | 5 | 7 | 1 | 5 | 5 | 13 | 4 | 106 |
| Turkey Vulture | | - | - | - | - | - | - | - | - | - | 1 | - | 1 |
| Bald Eagle | T | 0 | 1 | 1 | - | 0 | - | 1 | 0 | 0 | 7 | 2 | 12 |
| Northern Harrier | T | - | 2 | 2 | 1 | 2 | 2 | - | - | - | 1 | - | 10 |
| Sharp-shinned Hawk | SC | 8 | 6 | 7 | 3 | 3 | 3 | 3 | 1 | 4 | 3 | 2 | 43 |
| Cooper's Hawk | SC | 5 | 9 | 8 | 5 | 2 | 5 | 2 | 3 | 7 | 1 | 1 | 48 |
| Red-shouldered Hawk | SC | - | 1 | 2 | - | - | - | 2 | 2 | 2 | - | 1 | 10 |
| Red-tailed Hawk | | 50 | 121 | 94 | 50 | 42 | 88 | 32 | 25 | 60 | 42 | 22 | 626 |
| Rough-legged Hawk | | 23 | 21 | 7 | 6 | 8 | 3 | 5 | 9 | 12 | 4 | 2 | 100 |
| American Kestrel | | 5 | 22 | 17 | 8 | 7 | 14 | 10 | 3 | 6 | 12 | 7 | 111 |
| Merlin | | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 3 |
| American Coot | | 3 | 7 | 1,872 | 862 | 32 | 1,918 | 6 | 126 | 30 | 482 | 1 | 5,339 |
| Killdeer | | - | - | 1 | - | - | 2 | - | - | 1 | 3 | - | 7 |
| Wilson's Snipe | | - | - | 1 | 4 | 2 | 1 | - | - | 3 | - | - | 11 |
| American Woodcock | | - | - | - | - | - | 0 | - | - | - | - | - | 0 |
| Bonaparte's Gull | | - | - | 35 | 17 | - | 53 | - | 35 | - | 4 | - | 144 |

**Table D-4 Species Recorded During the Last 11 Years of the Jamestown Christmas Bird Count (1996-2007, Excluding 2002 When Surveys were not Conducted)**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Mew Gull | | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| Ring-billed Gull | | 249 | 636 | 3,423 | 2,291 | 419 | 6,611 | 301 | 1,111 | 96 | 2,126 | 299 | 17,562 |
| California Gull | | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| Herring Gull | | 45 | 50 | 83 | 163 | 42 | 84 | 12 | 200 | 16 | 50 | 4 | 749 |
| Great Black-backed Gull | | 5 | 12 | 14 | 5 | - | 1 | 3 | 0 | - | 0 | - | 40 |
| Rock Pigeon | | 407 | 1,403 | 1,635 | 1,508 | 686 | 1,874 | 393 | 367 | 573 | 527 | 682 | 10,055 |
| Mourning Dove | | 465 | 637 | 1,028 | 295 | 305 | 880 | 450 | 288 | 299 | 289 | 316 | 5,252 |
| Eastern Screech-Owl | | 3 | 5 | 6 | 7 | 2 | 8 | 7 | 7 | 9 | 13 | 1 | 68 |
| Great Horned Owl | | 4 | 6 | 11 | 3 | 5 | 8 | 4 | 6 | 6 | 3 | 3 | 59 |
| Barred Owl | | 4 | 1 | 1 | 2 | - | - | - | 1 | 1 | 3 | 1 | 14 |
| Short-eared Owl | E | - | - | - | - | - | - | 1 | - | 1 | 1 | - | 3 |
| Northern Saw-whet Owl | | - | - | - | - | - | - | 3 | - | 1 | 1 | - | 5 |
| Belted Kingfisher | | 4 | 7 | 2 | 5 | 2 | 7 | 2 | 1 | 3 | 8 | 2 | 43 |
| Red-headed Woodpecker | SC | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| Red-bellied Woodpecker | | 3 | 11 | 3 | 4 | - | 12 | 12 | 13 | 9 | 4 | 7 | 78 |
| Downy Woodpecker | | 117 | 123 | 73 | 55 | 44 | 115 | 59 | 82 | 73 | 58 | 49 | 848 |
| Hairy Woodpecker | | 18 | 37 | 14 | 7 | 4 | 24 | 16 | 17 | 24 | 13 | 15 | 189 |
| Northern Flicker | | 4 | 9 | 4 | 6 | 5 | 18 | 2 | - | 4 | 4 | 3 | 59 |
| Pileated Woodpecker | | 5 | 9 | 7 | 4 | 1 | 11 | 1 | 5 | 6 | 5 | 2 | 56 |
| Northern Shrike | | 2 | 3 | 4 | 3 | 1 | 3 | 7 | 5 | 1 | 3 | - | 32 |
| Blue Jay | | 353 | 455 | 294 | 77 | 183 | 294 | 164 | 96 | 316 | 247 | 137 | 2,616 |
| American Crow | | 2,398 | 1,498 | 1,158 | 3,757 | 1,213 | 1,223 | 698 | 1,131 | 5,000 | 1,996 | 4,217 | 24,289 |

**Table D-4 Species Recorded During the Last 11 Years of the Jamestown Christmas Bird Count (1996-2007, Excluding 2002 When Surveys were not Conducted)**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Common Raven | | - | - | - | - | - | - | - | - | - | 1 | - | 1 |
| Horned Lark | SC | 6 | 19 | 6 | 60 | 7 | 40 | - | - | - | - | 9 | 147 |
| Black-capped Chickadee | | 426 | 570 | 556 | 304 | 273 | 510 | 300 | 339 | 444 | 433 | 287 | 4,442 |
| Tufted Titmouse | | 15 | 54 | 24 | 20 | 9 | 34 | 39 | 35 | 33 | 21 | 49 | 333 |
| Red-breasted Nuthatch | | 5 | 21 | 7 | 8 | 1 | 10 | 11 | 8 | 14 | 5 | 14 | 104 |
| White-breasted Nuthatch | | 57 | 127 | 57 | 74 | 33 | 99 | 51 | 56 | 78 | 58 | 59 | 749 |
| Brown Creeper | | 6 | 7 | 7 | 1 | 6 | 6 | 3 | 2 | 3 | 6 | 1 | 48 |
| Carolina Wren | | 2 | 3 | 3 | 3 | 6 | 5 | 5 | 8 | 9 | 4 | 12 | 60 |
| Winter Wren | | 1 | - | - | 1 | 1 | - | 1 | - | 0 | - | - | 4 |
| Golden-crowned Kinglet | | 4 | 16 | 15 | 11 | 14 | 11 | 6 | 6 | 18 | 17 | 7 | 125 |
| Ruby-crowned Kinglet | | - | - | 1 | - | - | - | - | - | - | - | - | 1 |
| Eastern Bluebird | | 4 | 19 | 11 | 10 | 6 | 38 | 3 | - | 15 | 12 | 7 | 118 |
| American Robin | | 5 | 22 | 70 | 32 | 5 | 35 | 23 | 5 | 19 | 11 | 22 | 249 |
| Gray Catbird | | 1 | 1 | - | - | - | - | - | - | 1 | - | - | 3 |
| Northern Mockingbird | | 1 | 1 | - | - | - | 1 | - | - | 2 | 1 | - | 6 |
| Brown Thrasher | | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| European Starling | | 2,631 | 3,445 | 3,296 | 5,320 | 2,394 | 2,862 | 726 | 664 | 1,341 | 1,333 | 799 | 24,811 |
| American Pipit | | - | - | - | - | 1 | - | 1 | 1 | - | - | - | 3 |
| Cedar Waxwing | | 31 | 483 | 77 | 30 | 0 | 410 | 139 | 24 | 17 | 54 | 175 | 1,440 |
| Yellow-rumped Warbler | | 1 | - | - | - | - | 2 | - | - | - | - | - | 3 |
| Eastern Towhee | | 3 | - | - | - | - | - | - | - | - | - | - | 3 |
| American Tree Sparrow | | 64 | 165 | 168 | 86 | 39 | 31 | 164 | 218 | 230 | 59 | 172 | 1,396 |

**Table D-4 Species Recorded During the Last 11 Years of the Jamestown Christmas Bird Count (1996-2007, Excluding 2002 When Surveys were not Conducted)**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Field Sparrow | | - | - | - | - | - | - | - | - | 4 | - | - | 4 |
| Fox Sparrow | | - | - | - | - | - | - | - | - | 1 | 1 | - | 2 |
| Song Sparrow | | 10 | 12 | 6 | 3 | 5 | 4 | 23 | 9 | 34 | 1 | 11 | 118 |
| Swamp Sparrow | | 4 | 1 | - | - | - | - | 2 | - | - | - | 2 | 9 |
| White-throated Sparrow | | 24 | 47 | 14 | 2 | 7 | 35 | 38 | 29 | 61 | 7 | 20 | 284 |
| White-crowned Sparrow | | 1 | - | - | - | - | - | 3 | - | 1 | 0 | 1 | 6 |
| Dark-eyed Junco | | 315 | 476 | 383 | 61 | 237 | 348 | 468 | - | 405 | 146 | 337 | 3,176 |
| Snow Bunting | | 0 | 16 | 1 | 12 | 70 | - | - | - | - | - | 116 | 215 |
| Northern Cardinal | | 129 | 146 | 109 | 58 | 82 | 78 | 160 | 193 | 161 | 48 | 158 | 1,322 |
| Red-winged Blackbird | | - | 3 | 5 | - | 3 | 43 | 20 | - | 2 | 8 | - | 84 |
| Eastern Meadowlark | | 3 | - | - | - | - | - | - | - | - | - | - | 3 |
| Rusty Blackbird | | 1 | - | 1 | - | - | - | - | - | - | - | - | 2 |
| Common Grackle | | 9 | - | - | 1 | 1 | - | 5 | - | - | 1 | 12 | 29 |
| Brown-headed Cowbird | | - | 11 | 2 | 72 | - | 0 | 28 | 29 | 85 | - | 35 | 262 |
| Purple Finch | | 0 | 3 | 1 | 2 | - | 2 | 1 | 9 | 1 | 12 | 4 | 35 |
| House Finch | | 552 | 726 | 249 | 308 | 211 | 520 | 226 | 266 | 185 | 61 | 91 | 3,395 |
| Common Redpoll | | 16 | - | - | 10 | - | - | - | - | - | - | 4 | 30 |
| Pine Siskin | | - | - | - | - | - | 13 | 1 | - | 5 | - | - | 19 |
| American Goldfinch | | 109 | 171 | 108 | 131 | 100 | 304 | 292 | 234 | 128 | 51 | 194 | 1,822 |

**Table D-4 Species Recorded During the Last 11 Years of the Jamestown Christmas Bird Count (1996-2007, Excluding 2002 When Surveys were not Conducted)**

| Common Name | Listed Species | Year | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Evening Grosbeak | | 1 | 17 | - | - | - | - | - | - | - | - | - | 18 |
| House Sparrow | | 834 | 941 | 620 | 485 | 289 | 754 | 543 | 357 | 472 | 462 | 251 | 6,008 |
| **Grand Total** | | **13,204** | **14,333** | **24,126** | **20,996** | **8,772** | **25,267** | **8,437** | **8,257** | **12,223** | **14,313** | **10,201** | **160,129** |
| **Total Species** | | **78** | **77** | **82** | **78** | **64** | **78** | **71** | **69** | **79** | **82** | **63** | **113** |

Source: National Audubon Society 2007

Key :

E = Endangered (NY).
SC = Special Concern (NY).
T = Threatened (NY).

# E

# E & E Bird Survey Tables

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| 9/15/2006 | 09:08 | Northern Harrier | 1 | L | L | Local |
| | 09:32 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:02 | American Kestrel | 1 | L | L | Local |
| | 11:56 | Merlin | 1 | L | SE | Migrant |
| | 11:58 | Turkey Vulture | 13 | H | SE | Migrant |
| | 12:18 | Red-tailed Hawk | 2 | L | L | Local |
| | 12:28 | Turkey Vulture | 1 | H | SE | Migrant |
| | 12:37 | Turkey Vulture | 3 | L | NW | Local |
| | 12:55 | Red-tailed Hawk | 1 | L | L | Local |
| | 13:14 | American Kestrel | 1 | L | L | Local |
| | 13:24 | Turkey Vulture | 2 | L | SE | Local |
| | 13:43 | Northern Harrier | 1 | L | L | Local |
| | 13:47 | Turkey Vulture | 1 | L | SE | Migrant |
| | 13:57 | Turkey Vulture | 1 | H,L | S | Migrant |
| | 14:00 | Turkey Vulture | 1 | H | SW | Migrant |
| 10/5/2006 | 09:09 | Northern Harrier | 1 | L | L | Local |
| | 09:26 | Cooper's Hawk | 1 | L | N | Local |
| | 10:02 | Northern Harrier | 1 | H | SE | Migrant |
| | 10:03 | Turkey Vulture | 1 | H | E | Migrant |
| | 10:25 | Turkey Vulture | 8 | H | SE | Migrant |
| | 10:32 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:33 | Red-shouldered Hawk | 3 | H | W | Migrant |
| | 10:38 | Turkey Vulture | 3 | L | SW | Migrant |
| | 10:41 | Turkey Vulture | 3 | H | SE | Migrant |
| | 10:42 | Northern Harrier | 1 | L | L | Local |
| | 10:53 | Turkey Vulture | 2 | L | SE | Migrant |
| | 10:54 | Turkey Vulture | 1 | L | W | Migrant |
| | 11:04 | Red-shouldered Hawk | 1 | H | SE | Migrant |
| | 11:04 | Turkey Vulture | 4 | H | SE | Migrant |
| | 11:10 | Red-tailed Hawk | 1 | L | L | Local |
| | 11:22 | Sharp-shinned Hawk | 1 | H | SW | Migrant |
| | 11:37 | Turkey Vulture | 3 | H | SE | Migrant |
| | 12:04 | Merlin | 1 | L | S | Migrant |
| | 12:04 | Turkey Vulture | 1 | H | S | Migrant |
| | 12:09 | Cooper's Hawk | 1 | L | S | Migrant |
| | 12:33 | Red-shouldered Hawk | 2 | H | W | Migrant |
| | 13:14 | Turkey Vulture | 2 | H | SW | Migrant |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 13:22 | American Kestrel | 1 | L | L | Local |
| | 15:20 | Northern Harrier | 1 | H | S | Migrant |
| | 15:30 | Turkey Vulture | 3 | L | NE | Local |
| 11/1/2006 | 09:00 | American Kestrel | 1 | L | N | Local |
| | 09:34 | Northern Harrier | 2 | L | L | Local |
| | 10:01 | Red-tailed Hawk | 1 | H | N | Local |
| | 10:01 | Unknown Buteo | 2 | H | N | Local |
| | 10:03 | Unknown Buteo | 1 | H | L | Local |
| | 10:10 | Red-tailed Hawk | 1 | L | L | Local |
| | 11:29 | Red-tailed Hawk | 1 | L | S | Migrant |
| | 11:35 | Cooper's Hawk | 1 | L | NW | Local |
| | 11:41 | Unknown Raptor | 1 | H | W | Migrant |
| | 13:35 | Red-tailed Hawk | 4 | H | NE | Local |
| 4/22/2007 | 09:25 | Osprey | 1 | H | NE | Migrant |
| | 09:44 | Rough-legged Hawk | 2 | H | NE | Migrant |
| | 09:49 | Turkey Vulture | 1 | L | W | Local |
| | 09:55 | Broad-winged Hawk | 1 | H | NE | Migrant |
| | 09:59 | Cooper's Hawk | 1 | L | W | Local |
| | 10:00 | Turkey Vulture | 2 | L | E | Migrant |
| | 10:18 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:18 | Turkey Vulture | 4 | L | SE | Local |
| | 10:22 | Turkey Vulture | 1 | L | S | Local |
| | 10:28 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:28 | Rough-legged Hawk | 1 | L | SE | Local |
| | 10:39 | Unknown Buteo | 1 | H | E | Migrant |
| | 10:44 | Turkey Vulture | 2 | L | N | Migrant |
| | 10:47 | Unknown Buteo | 1 | H | N | Migrant |
| | 10:54 | Red-tailed Hawk | 1 | H | NE | Migrant |
| | 11:19 | Turkey Vulture | 1 | L | E | Local |
| | 12:30 | Turkey Vulture | 3 | L | SE | Local |
| | 12:35 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 12:35 | Turkey Vulture | 1 | L | SW | Local |
| | 13:03 | American Kestrel | 1 | L | W | Local |
| | 13:30 | American Kestrel | 1 | L | W | Local |
| | 15:21 | Northern Harrier | 1 | L | SW | Local |
| | 15:30 | Turkey Vulture | 3 | L | N | Migrant |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| 4/23/2007 | 09:07 | Sharp-shinned Hawk | 1 | L | NE | Migrant |
| | 09:10 | Red-tailed Hawk | 2 | L | L | Local |
| | 09:17 | Cooper's Hawk | 2 | L | L | Local |
| | 09:17 | Turkey Vulture | 1 | H | NE | Migrant |
| | 09:24 | Broad-winged Hawk | 2 | L | NE | Migrant |
| | 09:24 | Turkey Vulture | 3 | L | NE | Migrant |
| | 09:31 | Red-shouldered Hawk | 1 | L | L | Local |
| | 09:38 | Broad-winged Hawk | 9 | H | NE | Migrant |
| | 09:38 | Sharp-shinned Hawk | 2 | H | NE | Migrant |
| | 09:38 | Turkey Vulture | 1 | H | NE | Migrant |
| | 09:40 | Bald Eagle | 1 | L | NE | Migrant |
| | 09:46 | Broad-winged Hawk | 5 | H | NE | Migrant |
| | 09:46 | Sharp-shinned Hawk | 2 | H | NE | Migrant |
| | 09:52 | Turkey Vulture | 12 | H | NE | Migrant |
| | 09:56 | American Kestrel | 1 | L | L | Local |
| | 10:12 | Broad-winged Hawk | 2 | H | NE | Migrant |
| | 10:12 | Sharp-shinned Hawk | 1 | H | NE | Migrant |
| | 10:19 | Cooper's Hawk | 1 | H | NE | Migrant |
| | 10:24 | Sharp-shinned Hawk | 1 | H | NE | Migrant |
| | 11:36 | Broad-winged Hawk | 1 | H | NE | Migrant |
| | 12:10 | Turkey Vulture | 1 | H | NE | Migrant |
| | 12:41 | Broad-winged Hawk | 1 | L | L | Local |
| | 12:41 | Red-tailed Hawk | 1 | H | NE | Migrant |
| 4/30/2007 | 09:13 | Bald Eagle | 1 | L | ESE | Local |
| | 09:24 | Red-tailed Hawk | 1 | H | W | Migrant |
| | 09:29 | Turkey Vulture | 1 | L | L | Migrant |
| | 09:38 | Red-tailed Hawk | 1 | L | L | Local |
| | 09:41 | Unknown Raptor | 1 | L | L | Local |
| | 10:10 | Red-tailed Hawk | 1 | L | E | Local |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 10:19 | Red-tailed Hawk | 1 | H | NE | Migrant |
| | 10:19 | Unknown Raptor | 1 | H | W | Migrant |
| | 10:41 | Northern Harrier | 1 | H | NE | Migrant |
| | 10:42 | Turkey Vulture | 1 | L | NE | Migrant |
| | 10:45 | Red-tailed Hawk | 1 | H | L | Local |
| | 10:57 | Turkey Vulture | 1 | L | N | Local |
| | 11:14 | Turkey Vulture | 5 | - | E | Migrant |
| | 11:25 | Broad-winged Hawk | 1 | L | SW | Local |
| | 11:54 | Turkey Vulture | 5 | - | W | Migrant |
| | 12:01 | Turkey Vulture | 3 | H | W | Migrant |
| | 12:05 | Turkey Vulture | 1 | H | NE | Migrant |
| | 12:17 | Turkey Vulture | 5 | L | E | Migrant |
| | 12:20 | Turkey Vulture | 1 | L | SW | Local |
| | 12:26 | Turkey Vulture | 7 | L | E | Migrant |
| | 12:29 | Osprey | 1 | L | SE | Local |
| | 12:51 | Turkey Vulture | 2 | L | S | Local |
| | 13:43 | Turkey Vulture | 8 | L | SW | Local |
| | 13:58 | Red-tailed Hawk | 1 | L | S | Local |
| | 14:03 | Red-tailed Hawk | 1 | L | L | Local |
| | 14:28 | Turkey Vulture | 1 | L | SE | Local |
| | 14:36 | Turkey Vulture | 2 | L | L | Local |
| | 14:41 | Northern Harrier | 1 | L | W | Migrant |
| | 14:47 | Turkey Vulture | 2 | H | SW | Local |
| | 14:58 | Turkey Vulture | 4 | - | W | Migrant |
| | 15:17 | Turkey Vulture | 5 | L | W | Migrant |
| | 15:22 | Turkey Vulture | 1 | L | NE | Migrant |
| | 15:28 | Turkey Vulture | 8 | - | NE | Migrant |
| | 15:31 | Turkey Vulture | 5 | H | WSW | Local |
| 3/30/2008 | 09:07 | American Kestrel | 2 | L | L | Local |
| | 09:53 | Turkey Vulture | 4 | H | E | Migrant |
| | 10:14 | Red-tailed Hawk | 1 | H | E | Migrant |
| | 10:23 | Turkey Vulture | 2 | L | SE | Local |
| | 10:29 | Turkey Vulture | 1 | H | W | Migrant |
| | 10:45 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:58 | Turkey Vulture | 1 | L | SE | Local |
| | 11:05 | Turkey Vulture | 1 | H | E | Migrant |
| | 11:14 | Turkey Vulture | 1 | L | W | Migrant |
| | 11:42 | Turkey Vulture | 1 | L | E | Migrant |
| | 11:43 | Red-tailed Hawk | 1 | H | SW | Local |
| | 12:09 | Turkey Vulture | 2 | L | NE | Migrant |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 12:11 | Turkey Vulture | 1 | L | NE | Migrant |
| | 12:19 | Turkey Vulture | 4 | L | E | Migrant |
| | 12:41 | Turkey Vulture | 2 | H | N | Migrant |
| | 12:46 | Turkey Vulture | 2 | H | N | Migrant |
| | 12:48 | Turkey Vulture | 4 | H | E | Migrant |
| | 12:48 | Red-tailed Hawk | 2 | H | E | Migrant |
| | 13:03 | Turkey Vulture | 2 | L | SE | Local |
| | 13:19 | Rough-legged Hawk | 1 | H | E | Migrant |
| | 13:26 | Turkey Vulture | 1 | L | E | Migrant |
| | 13:28 | Red-tailed Hawk | 1 | H | L | Local |
| | 13:39 | Golden Eagle | 1 | L | E | Migrant |
| | 13:48 | Turkey Vulture | 1 | H | NW | Migrant |
| | 13:59 | Northern Harrier | 1 | L | NE | Migrant |
| | 14:06 | Red-tailed Hawk | 1 | L | NW | Local |
| | 14:10 | Turkey Vulture | 1 | L | N | Migrant |
| | 14:26 | Red-tailed Hawk | 1 | H | E | Migrant |
| | 14:52 | Unknown Raptor | 1 | H | NE | Migrant |
| | 14:55 | Northern Harrier | 1 | L | L | Local |
| | 15:04 | Turkey Vulture | 1 | L | N | Migrant |
| | 15:06 | Turkey Vulture | 2 | L | E | Migrant |
| | 15:11 | Turkey Vulture | 1 | L | N | Migrant |
| | 15:22 | Turkey Vulture | 9 | H | W | Migrant |
| | 15:26 | Rough-legged Hawk | 1 | H | S | Local |
| | 15:32 | Northern Harrier | 1 | H | NW | Migrant |
| | 15:35 | Red-tailed Hawk | 4 | L | NE | Migrant |
| | 15:37 | Turkey Vulture | 4 | H | NE | Migrant |
| 4/7/2008 | 09:04 | Red-tailed Hawk | 1 | L | L | Local |
| | 09:05 | Turkey Vulture | 1 | H | NW | Migrant |
| | 09:14 | Turkey Vulture | 3 | L | NW | Migrant |
| | 09:15 | Red-tailed Hawk | 2 | H | L | Local |
| | 09:28 | Turkey Vulture | 2 | L | SW | Local |
| | 09:39 | Turkey Vulture | 1 | L | NE | Migrant |
| | 09:43 | Turkey Vulture | 1 | H | NE | Migrant |
| | 09:54 | Turkey Vulture | 2 | L | NE | Migrant |
| | 09:57 | Turkey Vulture | 6 | L | NE | Migrant |
| | 10:04 | Turkey Vulture | 2 | L | NE | Migrant |
| | 10:09 | Turkey Vulture | 2 | L | NE | Migrant |
| | 10:17 | Turkey Vulture | 3 | L | NE | Migrant |
| | 10:17 | Turkey Vulture | 1 | L | E | Migrant |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 10:28 | Turkey Vulture | 3 | H | E | Migrant |
| | 10:35 | Turkey Vulture | 2 | L | E | Migrant |
| | 10:59 | Turkey Vulture | 1 | H | NE | Migrant |
| | 10:59 | Red-tailed Hawk | 1 | L | NE | Local |
| | 11:08 | Turkey Vulture | 1 | L | E | Migrant |
| | 11:10 | Turkey Vulture | 2 | L | E | Migrant |
| | 11:12 | Turkey Vulture | 3 | H | NE | Migrant |
| | 11:25 | Turkey Vulture | 3 | L | SE | Local |
| | 12:04 | Red-tailed Hawk | 2 | H | SE | Local |
| | 12:06 | Golden Eagle | 1 | H | NW | Migrant |
| | 12:09 | Turkey Vulture | 3 | H | N | Migrant |
| | 12:20 | American Kestrel | 1 | L | N | Local |
| | 12:23 | Turkey Vulture | 1 | L | L | Migrant |
| | 12:29 | Bald Eagle | 1 | L | E | Migrant |
| | 12:30 | Turkey Vulture | 1 | H | E | Migrant |
| | 12:38 | Turkey Vulture | 2 | L | SE | Local |
| | 12:41 | Turkey Vulture | 2 | L | SE | Local |
| | 12:49 | Turkey Vulture | 1 | H | S | Migrant |
| | 12:52 | Turkey Vulture | 1 | H | NE | Migrant |
| | 12:52 | Turkey Vulture | 2 | L | NE | Migrant |
| | 13:06 | Turkey Vulture | 1 | H | E | Migrant |
| | 13:35 | Turkey Vulture | 1 | L | W | Migrant |
| | 13:36 | Turkey Vulture | 3 | H | NE | Migrant |
| | 13:41 | Turkey Vulture | 2 | L | NE | Migrant |
| | 13:49 | Red-tailed Hawk | 1 | H | S | Local |
| | 14:02 | Turkey Vulture | 4 | H | E | Migrant |
| | 14:03 | Turkey Vulture | 1 | L | N | Migrant |
| | 14:09 | Turkey Vulture | 5 | H | SW | Local |
| | 14:13 | Bald Eagle | 1 | H | S | Local |
| | 14:13 | Turkey Vulture | 2 | H | SW | Local |
| | 14:16 | Turkey Vulture | 2 | H | E | Migrant |
| | 14:17 | Unknown Buteo | 1 | H | E | Migrant |
| | 14:29 | Turkey Vulture | 1 | L | E | Migrant |
| | 14:33 | Turkey Vulture | 3 | L | E | Migrant |
| | 14:39 | Red-tailed Hawk | 2 | H | E | Migrant |
| | 14:42 | Turkey Vulture | 2 | H | E | Migrant |
| | 15:21 | Common Raven | 1 | L | E | Migrant |
| | 15:30 | Turkey Vulture | 2 | L | N | Migrant |
| | 15:32 | Turkey Vulture | 2 | L | NE | Migrant |
| | 15:32 | Turkey Vulture | 1 | H | NE | Migrant |
| | 15:39 | Turkey Vulture | 1 | H | S | Local |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 15:43 | Turkey Vulture | 2 | L | S | Local |
| | 15:49 | Turkey Vulture | 3 | L | NE | Migrant |
| | 15:57 | Red-tailed Hawk | 1 | H | NE | Migrant |
| 4/15/2008 | 09:30 | Turkey Vulture | 2 | L | NE | Migrant |
| | 09:39 | Turkey Vulture | 4 | L | NE | Migrant |
| | 09:49 | Northern Harrier | 1 | L | W | Local |
| | 09:53 | Turkey Vulture | 1 | L | W | Local |
| | 10:46 | Turkey Vulture | 1 | L | W | Local |
| | 10:46 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:56 | Turkey Vulture | 1 | H | W | Migrant |
| | 11:08 | Northern Harrier | 1 | H | SE | Local |
| | 12:16 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 12:16 | Common Raven | 2 | H | NE | Migrant |
| | 12:53 | Turkey Vulture | 2 | L | NE | Migrant |
| | 13:05 | Red-tailed Hawk | 1 | L | N | Local |
| | 13:12 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 13:15 | Turkey Vulture | 3 | H | NE | Migrant |
| | 13:22 | Turkey Vulture | 1 | H | NE | Migrant |
| | 13:26 | Turkey Vulture | 2 | H | NE | Migrant |
| | 13:30 | Red-tailed Hawk | 1 | L | L | Local |
| | 13:38 | Turkey Vulture | 2 | H | NE | Migrant |
| | 14:22 | Turkey Vulture | 2 | H | NE | Migrant |
| | 14:39 | American Kestrel | 1 | L | L | Local |
| | 14:43 | Turkey Vulture | 1 | L | NE | Migrant |
| | 14:50 | Common Raven | 1 | H | NE | Migrant |
| | 15:21 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 15:24 | American Kestrel | 1 | L | L | Local |
| | 15:41 | Turkey Vulture | 1 | L | NE | Migrant |
| 4/24/2008 | 09:08 | Turkey Vulture | 1 | H | W | Migrant |
| | 09:11 | Red-tailed Hawk | 1 | L | L | Local |
| | 09:28 | Red-tailed Hawk | 2 | H | L | Local |
| | 09:34 | Turkey Vulture | 2 | H | NE | Migrant |
| | 09:48 | Turkey Vulture | 3 | H | L | Local |
| | 09:48 | Turkey Vulture | 3 | L | L | Local |
| | 09:51 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 10:00 | Turkey Vulture | 2 | H | NE | Migrant |
| | 10:10 | Turkey Vulture | 1 | L | N | Migrant |
| | 10:15 | Red-tailed Hawk | 2 | L | L | Local |
| | 10:15 | Turkey Vulture | 1 | L | S | Local |
| | 10:18 | Turkey Vulture | 1 | L | N | Migrant |
| | 10:23 | Turkey Vulture | 2 | L | L | Local |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 10:32 | Turkey Vulture | 2 | L | L | Local |
| | 10:32 | Red-tailed Hawk | 1 | L | L | Local |
| | 10:47 | Turkey Vulture | 1 | L | L | Local |
| | 10:58 | Turkey Vulture | 1 | L | L | Local |
| | 11:01 | Turkey Vulture | 4 | L | L | Local |
| | 11:09 | Turkey Vulture | 5 | L | L | Local |
| | 11:10 | Red-tailed Hawk | 1 | L | L | Local |
| | 11:52 | Turkey Vulture | 3 | L | L | Local |
| | 11:52 | Red-tailed Hawk | 1 | H | L | Local |
| | 12:03 | Turkey Vulture | 4 | H | L | Local |
| | 12:15 | Red-tailed Hawk | 3 | L | NE | Migrant |
| | 12:15 | Turkey Vulture | 5 | L | L | Local |
| | 12:16 | Red-tailed Hawk | 1 | L | L | Local |
| | 12:29 | Turkey Vulture | 3 | L | NE | Migrant |
| | 12:43 | Turkey Vulture | 6 | H | W | Migrant |
| | 12:49 | Turkey Vulture | 1 | H | L | Local |
| | 12:49 | Turkey Vulture | 1 | H | NE | Migrant |
| | 13:06 | Turkey Vulture | 1 | H | L | Local |
| | 13:28 | Turkey Vulture | 1 | L | L | Local |
| | 13:41 | Turkey Vulture | 2 | H | W | Migrant |
| | 13:51 | Turkey Vulture | 1 | H | NE | Migrant |
| | 14:00 | Turkey Vulture | 1 | H | L | Local |
| | 14:08 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 14:10 | Turkey Vulture | 2 | H | W | Migrant |
| | 14:19 | Turkey Vulture | 1 | L | L | Local |
| | 14:20 | Turkey Vulture | 2 | L | NW | Migrant |
| | 14:31 | Turkey Vulture | 3 | L | NE | Migrant |
| | 14:42 | Red-tailed Hawk | 3 | H | NE | Migrant |
| | 14:44 | Turkey Vulture | 1 | L | W | Migrant |
| | 14:50 | Turkey Vulture | 1 | L | NE | Migrant |
| | 14:52 | Turkey Vulture | 2 | L | L | Local |
| | 15:05 | Turkey Vulture | 3 | H | L | Local |
| | 15:12 | Turkey Vulture | 2 | L | L | Local |
| | 15:26 | Turkey Vulture | 3 | L | L | Local |
| | 15:34 | Turkey Vulture | 3 | L | L | Local |
| | 15:34 | Red-tailed Hawk | 1 | L | L | Local |
| | 15:36 | Turkey Vulture | 2 | L | L | Local |
| | 15:44 | Turkey Vulture | 3 | L | L | Local |
| | 15:48 | Turkey Vulture | 4 | H | NE | Migrant |
| | 15:54 | Red-tailed Hawk | 1 | L | L | Local |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| 5/6/2008 | 09:04 | American Kestrel | 1 | L | L | Local |
| | 09:07 | Turkey Vulture | 1 | L | L | Local |
| | 09:12 | Turkey Vulture | 2 | H | L | Local |
| | 09:37 | Turkey Vulture | 1 | L | L | Local |
| | 09:42 | Turkey Vulture | 2 | L | L | Local |
| | 10:01 | Turkey Vulture | 7 | L | L | Local |
| | 10:07 | Turkey Vulture | 4 | L | L | Local |
| | 10:31 | Turkey Vulture | 4 | H | L | Local |
| | 10:31 | Red-tailed Hawk | 4 | H | L | Local |
| | 10:34 | Turkey Vulture | 1 | H | L | Local |
| | 10:48 | Red-tailed Hawk | 1 | H | L | Local |
| | 10:52 | American Kestrel | 1 | L | E | Migrant |
| | 10:55 | Turkey Vulture | 1 | L | L | Local |
| | 11:29 | Turkey Vulture | 2 | L | L | Local |
| | 11:29 | Turkey Vulture | 1 | H | L | Local |
| | 11:48 | Turkey Vulture | 2 | L | L | Local |
| | 11:51 | Red-tailed Hawk | 1 | H | L | Local |
| | 11:51 | Turkey Vulture | 4 | H | L | Local |
| | 12:12 | Turkey Vulture | 7 | L | L | Local |
| | 12:13 | Turkey Vulture | 1 | L | E | Migrant |
| | 12:23 | Red-tailed Hawk | 1 | H | L | Local |
| | 12:46 | Red-tailed Hawk | 1 | H | L | Local |
| | 13:01 | Turkey Vulture | 5 | L | L | Local |
| | 13:08 | American Kestrel | 1 | L | L | Local |
| | 13:21 | Red-tailed Hawk | 1 | H | N | Migrant |
| | 13:27 | Turkey Vulture | 1 | L | NE | Migrant |
| | 13:27 | Turkey Vulture | 2 | L | SE | Local |
| | 13:33 | Turkey Vulture | 2 | L | L | Local |
| | 13:39 | Turkey Vulture | 1 | H | N | Migrant |
| | 13:44 | Northern Harrier | 1 | L | NE | Migrant |
| | 13:52 | Red-tailed Hawk | 2 | H | NE | Migrant |
| | 13:52 | Sharp-shinned Hawk | 1 | H | NE | Migrant |
| | 14:01 | Turkey Vulture | 11 | L | L | Local |
| | 14:10 | Red-tailed Hawk | 1 | L | L | Local |
| | 14:26 | Red-tailed Hawk | 1 | L | L | Local |
| | 15:01 | Turkey Vulture | 1 | H | NE | Migrant |
| 5/13/2008 | 09:12 | Turkey Vulture | 4 | L | L | Local |
| | 09:35 | Red-tailed Hawk | 1 | L | L | Local |
| | 09:38 | Turkey Vulture | 2 | L | L | Local |
| | 09:49 | Northern Harrier | 1 | L | L | Local |

**Table E-1 Raptor Survey Data for Surveys Conducted in the Ball Hill Project Area in Fall 2006, Spring 2007, and Spring 2008**

| Date | Time | Common Name | Number | Height | Direction[1] | Local?[2] |
|---|---|---|---|---|---|---|
| | 10:03 | Turkey Vulture | 3 | L | L | Local |
| | 10:18 | Turkey Vulture | 5 | L | L | Local |
| | 10:35 | Turkey Vulture | 6 | L | L | Local |
| | 10:56 | Red-tailed Hawk | 1 | H | L | Local |
| | 11:03 | Turkey Vulture | 3 | H | W | Migrant |
| | 11:16 | Turkey Vulture | 3 | L | L | Local |
| | 11:23 | Turkey Vulture | 11 | L | L | Local |
| | 11:27 | Red-tailed Hawk | 1 | L | L | Local |
| | 11:54 | Turkey Vulture | 1 | L | L | Local |
| | 12:10 | Turkey Vulture | 2 | L | L | Local |
| | 12:18 | Turkey Vulture | 3 | L | L | Local |
| | 12:32 | Turkey Vulture | 11 | H | L | Local |
| | 13:06 | Red-tailed Hawk | 1 | L | SW | Local |
| | 13:18 | Red-tailed Hawk | 2 | L | L | Local |
| | 13:18 | Turkey Vulture | 2 | L | L | Local |
| | 13:45 | Turkey Vulture | 10 | L | L | Local |
| | 14:08 | Northern Harrier | 1 | L | L | Local |
| | 14:14 | Turkey Vulture | 5 | L | L | Local |
| | 14:30 | Osprey | 2 | H | NE | Migrant |
| | 14:43 | Turkey Vulture | 4 | L | L | Local |
| | 14:57 | Red-tailed Hawk | 2 | L | L | Local |
| | 15:03 | Red-tailed Hawk | 1 | L | L | Local |
| | 15:11 | American Kestrel | 1 | P | L | Local |
| | 15:24 | Turkey Vulture | 3 | L | L | Local |
| | 15:43 | American Kestrel | 1 | L | L | Local |
| | 15:45 | Turkey Vulture | 6 | L | L | Local |

[1] Local birds do not have a direction indicated and are denoted with an L.
[2] Indicates whether raptors observed were thought to be migratory or local birds based on behavior and direction of movement.

Key:
H = High (>400 feet)
L = Low (<400 feet)
P = Perched
N = North
E = East
S = South
W = West

**Table E-2 Ball Hill Project Area, Migratory Survey by Date, Totals From Two Dates**

| Species | 5/11/2007 | 5/22/2007 | Total |
|---|---|---|---|
| Canada Goose | 27 | 30 | **57** |
| Mallard | 7 | 0 | **7** |
| Ring-necked Pheasant | 0 | 2 | **2** |
| Ruffed Grouse | 1 | 0 | **1** |
| Wild Turkey | 13 | 7 | **20** |
| Great Blue Heron | 1 | 0 | **1** |
| Turkey Vulture | 18 | 1 | **19** |
| Osprey | 1 | 0 | **1** |
| Northern Harrier | 0 | 1 | **1** |
| Sharp-shinned Hawk | 1 | 0 | **1** |
| Broad-winged Hawk | 1 | 0 | **1** |
| Red-tailed Hawk | 2 | 0 | **2** |
| American Kestrel | 1 | 0 | **1** |
| Killdeer | 4 | 6 | **10** |
| Mourning Dove | 16 | 18 | **34** |
| Black-billed Cuckoo | 1 | 1 | **2** |
| Barred Owl | 1 | 0 | **1** |
| Ruby-throated Hummingbird | 0 | 1 | **1** |
| Red-bellied Woodpecker | 6 | 0 | **6** |
| Yellow-bellied Sapsucker | 3 | 9 | **12** |
| Downy Woodpecker | 3 | 2 | **5** |
| Hairy Woodpecker | 2 | 1 | **3** |
| Northern Flicker | 7 | 4 | **11** |
| Eastern Wood-Pewee | 0 | 1 | **1** |
| Alder Flycatcher | 1 | 4 | **5** |
| Willow Flycatcher | 0 | 3 | **3** |
| Least Flycatcher | 0 | 3 | **3** |
| Great Crested Flycatcher | 0 | 5 | **5** |
| Eastern Kingbird | 5 | 6 | **11** |
| Blue-headed Vireo | 2 | 5 | **7** |
| Warbling Vireo | 1 | 4 | **5** |
| Red-eyed Vireo | 1 | 5 | **6** |
| Blue Jay | 15 | 8 | **23** |
| American Crow | 61 | 64 | **125** |
| Common Raven | 2 | 1 | **3** |
| Tree Swallow | 4 | 17 | **21** |
| N Rough-winged Swallow | 4 | 0 | **4** |
| Cliff Swallow | 1 | 0 | **1** |
| Barn Swallow | 21 | 31 | **52** |
| Black-capped Chickadee | 22 | 25 | **47** |
| Tufted Titmouse | 1 | 0 | **1** |
| White-breasted Nuthatch | 2 | 2 | **4** |
| House Wren | 4 | 10 | **14** |
| Winter Wren | 2 | 0 | **2** |

**Table E-2 Ball Hill Project Area, Migratory Survey by Date, Totals From Two Dates**

| Species | 5/11/2007 | 5/22/2007 | Total |
|---|---|---|---|
| Eastern Bluebird | 0 | 1 | **1** |
| Veery | 1 | 0 | **1** |
| Swainson's Thrush | 0 | 2 | **2** |
| Hermit Thrush | 4 | 1 | **5** |
| Wood Thrush | 7 | 4 | **11** |
| American Robin | 23 | 35 | **58** |
| Gray Catbird | 9 | 17 | **26** |
| Northern Mockingbird | 1 | 0 | **1** |
| Cedar Waxwing | 0 | 4 | **4** |
| Blue-winged Warbler | 5 | 2 | **7** |
| Nashville Warbler | 2 | 2 | **4** |
| Yellow Warbler | 35 | 20 | **55** |
| Chestnut-sided Warbler | 19 | 9 | **28** |
| Magnolia Warbler | 3 | 0 | **3** |
| Black-thr. Blue Warbler | 2 | 0 | **2** |
| Yellow-rumped Warbler | 22 | 2 | **24** |
| Black-thr. Green Warbler | 3 | 3 | **6** |
| Blackburnian Warbler | 0 | 2 | **2** |
| Palm Warbler | 1 | 0 | **1** |
| Black-and-white Warbler | 1 | 0 | **1** |
| American Redstart | 0 | 7 | **7** |
| Ovenbird | 4 | 3 | **7** |
| Mourning Warbler | 3 | 2 | **5** |
| Common Yellowthroat | 18 | 38 | **56** |
| Hooded Warbler | 13 | 1 | **14** |
| Scarlet Tanager | 2 | 0 | **2** |
| Eastern Towhee | 2 | 5 | **7** |
| Chipping Sparrow | 10 | 15 | **25** |
| Field Sparrow | 2 | 7 | **9** |
| Savannah Sparrow | 6 | 13 | **19** |
| Song Sparrow | 30 | 30 | **60** |
| Swamp Sparrow | 3 | 0 | **3** |
| White-crowned Sparrow | 3 | 0 | **3** |
| Dark-eyed Junco | 5 | 0 | **5** |
| Northern Cardinal | 12 | 12 | **24** |
| Rose-breasted Grosbeak | 3 | 2 | **5** |
| Indigo Bunting | 0 | 15 | **15** |
| Bobolink | 28 | 71 | **99** |
| Red-winged Blackbird | 154 | 107 | **261** |
| Eastern Meadowlark | 7 | 7 | **14** |
| Common Grackle | 10 | 34 | **44** |
| Brown-headed Cowbird | 3 | 17 | **20** |
| Baltimore Oriole | 21 | 14 | **35** |
| Purple Finch | 10 | 4 | **14** |

**Table E-2 Ball Hill Project Area, Migratory Survey by Date, Totals From Two Dates**

| Species | 5/11/2007 | 5/22/2007 | Total |
|---|---|---|---|
| House Finch | 0 | 2 | **2** |
| American Goldfinch | 35 | 50 | **85** |
| **Total Birds:** | **787** | **837** | **1,624** |
| **Species Count:** | **76** | **66** | |
| **Total Species:** | **90** | | |

**Table E-3 Ball Hill Project Area, Migratory Bird Survey by Location, 5/11/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada Goose | 1 | 0 | 0 | 0 | 0 | 2 | 5 | 7 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 2 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **27** |
| Mallard | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **7** |
| Ruffed Grouse | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Wild Turkey | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | **13** |
| Great Blue Heron | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Turkey Vulture | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | **18** |
| Osprey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Sharp-shinned Hawk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **1** |
| Broad-winged Hawk | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Red-tailed Hawk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | **2** |
| American Kestrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Killdeer | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Mourning Dove | 1 | 2 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | **16** |
| Black-billed Cuckoo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Barred Owl | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Red-bellied Woodpecker | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **6** |
| Yellow-bellied Sapsucker | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **3** |
| Downy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | **3** |
| Hairy Woodpecker | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Northern Flicker | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **7** |
| Alder Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Kingbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **5** |
| Blue-headed Vireo | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |

**Table E-3 Ball Hill Project Area, Migratory Bird Survey by Location, 5/11/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Warbling Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Red-eyed Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Blue Jay | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **15** |
| American Crow | 3 | 2 | 2 | 5 | 4 | 5 | 0 | 2 | 0 | 0 | 2 | 7 | 0 | 1 | 2 | 3 | 0 | 0 | 1 | 0 | 3 | 2 | 3 | 2 | 7 | 0 | 4 | 1 | **61** |
| Common Raven | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Tree Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| N Rough-winged Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Cliff Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Barn Swallow | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | **21** |
| Black-capped Chickadee | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 3 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | **22** |
| Tufted Titmouse | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| White-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| House Wren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **4** |
| Winter Wren | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **2** |
| Veery | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Hermit Thrush | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **4** |
| Wood Thrush | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **7** |
| American Robin | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 | 0 | 3 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | **23** |
| Gray Catbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | **9** |
| Northern Mockingbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| Blue-winged Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | **5** |
| Nashville Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Yellow Warbler | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 8 | 2 | 0 | 0 | 1 | 0 | 1 | 3 | 3 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 4 | 1 | 2 | 0 | 1 | **35** |
| Chestnut-sided Warbler | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 3 | 4 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **19** |
| Magnolia Warbler | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **3** |

**Table E-3 Ball Hill Project Area, Migratory Bird Survey by Location, 5/11/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-thr. Blue Warbler | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Yellow-rumped Warbler | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **22** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **3** |
| Palm Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Black-and-white Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Ovenbird | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Mourning Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Common Yellowthroat | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 0 | 0 | **18** |
| Hooded Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **13** |
| Scarlet Tanager | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Eastern Towhee | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Chipping Sparrow | 4 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | **10** |
| Field Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **2** |
| Savannah Sparrow | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **6** |
| Song Sparrow | 0 | 0 | 2 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 2 | 2 | 1 | 3 | 0 | 1 | 0 | 1 | **30** |
| Swamp Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| White-crowned Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Dark-eyed Junco | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Northern Cardinal | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | **12** |
| Rose-breasted Grosbeak | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Bobolink | 0 | 3 | 2 | 3 | 0 | 0 | 4 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 2 | 0 | 0 | 0 | **28** |
| Red-winged Blackbird | 3 | 15 | 9 | 8 | 9 | 3 | 9 | 14 | 6 | 9 | 5 | 5 | 0 | 3 | 0 | 6 | 3 | 0 | 9 | 0 | 3 | 6 | 3 | 4 | 11 | 4 | 0 | 7 | **154** |
| Eastern | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **7** |

**Table E-3 Ball Hill Project Area, Migratory Bird Survey by Location, 5/11/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Meadowlark | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Common Grackle | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **10** |
| Brown-headed Cowbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | **3** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 1 | 0 | 4 | 2 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | **21** |
| Purple Finch | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | **10** |
| American Goldfinch | 0 | 2 | 1 | 0 | 3 | 2 | 1 | 2 | 2 | 0 | 0 | 3 | 3 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 2 | 4 | **35** |
| **Total Birds:** | **36** | **33** | **23** | **24** | **42** | **24** | **37** | **73** | **21** | **29** | **23** | **33** | **24** | **32** | **23** | **46** | **25** | **22** | **18** | **14** | **15** | **26** | **18** | **27** | **34** | **20** | **12** | **33** | **787** |
| **Species Count:** | **23** | **13** | **11** | **10** | **18** | **16** | **15** | **26** | **10** | **11** | **9** | **15** | **14** | **19** | **14** | **17** | **16** | **15** | **6** | **12** | **8** | **16** | **10** | **12** | **13** | **13** | **8** | **16** | |
| **Total Species:** | **76** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Table E-4 Ball Hill Project Area, Migratory Bird Survey by Location, 5/22/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada Goose | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 9 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | **30** |
| Ring-necked Pheasant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **2** |
| Wild Turkey | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | **7** |
| Turkey Vulture | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| Northern Harrier | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Killdeer | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **6** |
| Mourning Dove | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 0 | 0 | 3 | 1 | 0 | 0 | **18** |
| Black-billed Cuckoo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| Ruby-thrtd Hummingbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **1** |
| Yellow-bellied Sapsucker | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **9** |
| Downy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Hairy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Northern Flicker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **4** |
| Eastern Wood-Pewee | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Alder Flycatcher | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **4** |
| Willow Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **3** |
| Least Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **3** |
| Great Crested Flycatcher | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Eastern Kingbird | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | **6** |

**Table E-4 Ball Hill Project Area, Migratory Bird Survey by Location, 5/22/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue-headed Vireo | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **5** |
| Warbling Vireo | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **4** |
| Red-eyed Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | **5** |
| Blue Jay | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | **8** |
| American Crow | 2 | 1 | 2 | 3 | 3 | 6 | 4 | 1 | 6 | 1 | 3 | 3 | 0 | 4 | 2 | 2 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 6 | 2 | 3 | 2 | **64** |
| Common Raven | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **1** |
| Tree Swallow | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | **17** |
| Barn Swallow | 2 | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 2 | 2 | 1 | 0 | 0 | 1 | **31** |
| Black-capped Chickadee | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 2 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | **25** |
| White-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | **2** |
| House Wren | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | **10** |
| Eastern Bluebird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Swainson's Thrush | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Hermit Thrush | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Wood Thrush | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| American Robin | 5 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | **35** |
| Gray Catbird | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | **17** |
| Cedar Waxwing | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | **4** |
| Blue-winged Warbler | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **2** |
| Nashville Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Yellow Warbler | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | **20** |
| Chestnut-sided Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | **9** |

**Table E-4 Ball Hill Project Area, Migratory Bird Survey by Location, 5/22/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yellow-rumped Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **3** |
| Blackburnian Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| American Redstart | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **7** |
| Ovenbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| Mourning Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **2** |
| Common Yellowthroat | 2 | 2 | 1 | 2 | 2 | 0 | 1 | 2 | 2 | 0 | 0 | 2 | 2 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 2 | **38** |
| Hooded Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Towhee | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Chipping Sparrow | 3 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | **15** |
| Field Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **7** |
| Savannah Sparrow | 0 | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | **13** |
| Song Sparrow | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 3 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 0 | 2 | 0 | 3 | 2 | 2 | 1 | 0 | 1 | **30** |
| Northern Cardinal | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | **12** |
| Rose-breasted Grosbeak | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Indigo Bunting | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | **15** |
| Bobolink | 1 | 16 | 4 | 4 | 1 | 4 | 4 | 0 | 0 | 7 | 9 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 3 | 2 | 3 | 0 | 2 | 0 | 0 | **71** |
| Red-winged Blackbird | 2 | 5 | 6 | 6 | 7 | 4 | 7 | 6 | 1 | 11 | 10 | 5 | 0 | 0 | 0 | 5 | 0 | 2 | 8 | 0 | 0 | 2 | 5 | 2 | 11 | 2 | 0 | 0 | **107** |
| Eastern Meadowlark | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **7** |
| Common Grackle | 1 | 0 | 5 | 0 | 0 | 3 | 1 | 0 | 1 | 5 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 0 | **34** |

**Table E-4 Ball Hill Project Area, Migratory Bird Survey by Location, 5/22/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brown-headed Cowbird | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 6 | **17** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | **14** |
| Purple Finch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| House Finch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **2** |
| American Goldfinch | 0 | 0 | 5 | 3 | 1 | 0 | 0 | 0 | 2 | 3 | 4 | 1 | 0 | 2 | 3 | 0 | 5 | 3 | 1 | 1 | 2 | 0 | 0 | 4 | 3 | 3 | 4 | 0 | **50** |
| **Total Birds:** | **32** | **40** | **35** | **25** | **31** | **28** | **32** | **37** | **27** | **43** | **39** | **33** | **21** | **18** | **17** | **38** | **25** | **30** | **31** | **15** | **23** | **42** | **28** | **31** | **44** | **26** | **21** | **25** | **837** |
| **Species Count:** | **20** | **16** | **15** | **11** | **20** | **12** | **18** | **16** | **17** | **13** | **12** | **18** | **15** | **12** | **11** | **22** | **17** | **20** | **14** | **12** | **16** | **15** | **17** | **18** | **21** | **16** | **13** | **16** | |
| **Total Species:** | **66** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Table E-5 Ball Hill Project Area, Migratory Survey by Date, 2008**

| Species | 5/6/2008 | 5/16/2008 | Total |
|---|---|---|---|
| Canada Goose | 27 | 25 | **52** |
| Mallard | 1 | 1 | **2** |
| Wild Turkey | 5 | 6 | **11** |
| Great Blue Heron | 0 | 1 | **1** |
| Turkey Vulture | 2 | 0 | **2** |
| Red-shouldered Hawk | 1 | 0 | **1** |
| Red-tailed Hawk | 0 | 1 | **1** |
| American Kestrel | 2 | 2 | **4** |
| Killdeer | 5 | 4 | **9** |
| Mourning Dove | 14 | 13 | **27** |
| Ruby-throated Hummingbird | 0 | 1 | **1** |
| Red-bellied Woodpecker | 1 | 2 | **3** |
| Yellow-bellied Sapsucker | 8 | 6 | **14** |
| Downy Woodpecker | 2 | 5 | **7** |
| Hairy Woodpecker | 1 | 1 | **2** |
| Northern Flicker | 4 | 12 | **16** |
| Least Flycatcher | 2 | 1 | **3** |
| Eastern Phoebe | 0 | 1 | **1** |
| Great Crested Flycatcher | 4 | 6 | **10** |
| Eastern Kingbird | 0 | 10 | **10** |
| Blue-headed Vireo | 2 | 1 | **3** |
| Warbling Vireo | 6 | 4 | **10** |
| Red-eyed Vireo | 0 | 7 | **7** |
| Blue Jay | 19 | 31 | **50** |
| American Crow | 48 | 91 | **139** |
| Tree Swallow | 3 | 10 | **13** |
| Barn Swallow | 17 | 22 | **39** |
| Black-capped Chickadee | 1 | 10 | **11** |
| Red-breasted Nuthatch | 0 | 3 | **3** |
| White-breasted Nuthatch | 1 | 3 | **4** |
| House Wren | 14 | 10 | **24** |
| Winter Wren | 2 | 2 | **4** |
| Ruby-crowned Kinglet | 0 | 1 | **1** |
| Eastern Bluebird | 1 | 4 | **5** |
| Veery | 0 | 2 | **2** |
| Wood Thrush | 10 | 11 | **21** |
| American Robin | 58 | 77 | **135** |
| Gray Catbird | 8 | 5 | **13** |
| Brown Thrasher | 5 | 5 | **10** |
| American Pipit | 1 | 0 | **1** |
| Blue-winged Warbler | 4 | 2 | **6** |
| Nashville Warbler | 4 | 1 | **5** |
| Yellow Warbler | 23 | 19 | **42** |
| Chestnut-sided Warbler | 4 | 2 | **6** |

**Table E-5 Ball Hill Project Area, Migratory Survey by Date, 2008**

| Species | 5/6/2008 | 5/16/2008 | Total |
|---|---|---|---|
| Magnolia Warbler | 0 | 2 | **2** |
| Black-thr. Blue Warbler | 0 | 2 | **2** |
| Yellow-rumped Warbler | 3 | 4 | **7** |
| Black-thr. Green Warbler | 2 | 5 | **7** |
| Blackburnian Warbler | 1 | 2 | **3** |
| Bay-breasted Warbler | 0 | 1 | **1** |
| Black-and-white Warbler | 0 | 1 | **1** |
| American Redstart | 1 | 3 | **4** |
| Ovenbird | 4 | 8 | **12** |
| Common Yellowthroat | 6 | 16 | **22** |
| Hooded Warbler | 1 | 3 | **4** |
| Scarlet Tanager | 0 | 3 | **3** |
| Eastern Towhee | 4 | 2 | **6** |
| Chipping Sparrow | 16 | 24 | **40** |
| Field Sparrow | 12 | 8 | **20** |
| Savannah Sparrow | 8 | 16 | **24** |
| Song Sparrow | 38 | 55 | **93** |
| Swamp Sparrow | 5 | 4 | **9** |
| White-crowned Sparrow | 1 | 3 | **4** |
| Northern Cardinal | 11 | 7 | **18** |
| Rose-breasted Grosbeak | 7 | 5 | **12** |
| Indigo Bunting | 1 | 3 | **4** |
| Bobolink | 48 | 42 | **90** |
| Red-winged Blackbird | 126 | 113 | **239** |
| Eastern Meadowlark | 16 | 12 | **28** |
| Common Grackle | 21 | 15 | **36** |
| Brown-headed Cowbird | 18 | 24 | **42** |
| Baltimore Oriole | 9 | 8 | **17** |
| Purple Finch | 1 | 6 | **7** |
| House Finch | 3 | 3 | **6** |
| American Goldfinch | 45 | 64 | **109** |
| **Total Birds:** | **718** | **885** | **1603** |
| **Species Count:** | **61** | **72** | |
| **Total Species:** | **75** | | |

**Table E-6 Ball Hill Project Area, Migratory Bird Survey by Location, 5/6/2008**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada Goose | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | **27** |
| Mallard | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Wild Turkey | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Turkey Vulture | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Red-shouldered Hawk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Kestrel | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Killdeer | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Mourning Dove | 2 | 3 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **14** |
| Red-bellied Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow-bellied Sapsucker | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | **8** |
| Downy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Hairy Woodpecker | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Northern Flicker | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Least Flycatcher | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Great Crested Flycatcher | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Blue-headed Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Warbling Vireo | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **6** |
| Blue Jay | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | **19** |
| American Crow | 0 | 5 | 3 | 0 | 3 | 3 | 4 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 2 | 2 | 0 | 3 | 1 | 0 | 0 | 4 | 4 | 1 | 1 | 0 | 0 | 1 | 0 | 3 | 2 | 0 | 0 | **48** |
| Tree Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Barn Swallow | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **17** |
| Black-capped Chickadee | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| White-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| House Wren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 2 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | **14** |
| Winter Wren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | **2** |
| Eastern Bluebird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Wood Thrush | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | **10** |

**Table E-6 Ball Hill Project Area, Migratory Bird Survey by Location, 5/6/2008**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| American Robin | 3 | 2 | 1 | 3 | 4 | 1 | 4 | 2 | 3 | 3 | 4 | 3 | 0 | 2 | 0 | 3 | 2 | 4 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 4 | 0 | 0 | 1 | 0 | 1 | 3 | 0 | **58** |
| Gray Catbird | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **8** |
| Brown Thrasher | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| American Pipit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Blue-winged Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Nashville Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **4** |
| Yellow Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | **23** |
| Chestnut-sided Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Yellow-rumped Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Blackburnian Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Redstart | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Ovenbird | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Common Yellowthroat | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **6** |
| Hooded Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Towhee | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Chipping Sparrow | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | **16** |
| Field Sparrow | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | **12** |
| Savannah Sparrow | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | **8** |
| Song Sparrow | 0 | 2 | 0 | 2 | 2 | 0 | 1 | 4 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 3 | 2 | 0 | 4 | 0 | 1 | 2 | 2 | 0 | **38** |
| Swamp Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| White-crowned Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Northern Cardinal | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **11** |
| Rose-breasted Grosbeak | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | **7** |
| Indigo Bunting | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |

**Table E-6 Ball Hill Project Area, Migratory Bird Survey by Location, 5/6/2008**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bobolink | 3 | 11 | 3 | 3 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 3 | 8 | 0 | 2 | 0 | **48** |
| Red-winged Blackbird | 0 | 5 | 8 | 5 | 9 | 1 | 6 | 7 | 0 | 9 | 7 | 9 | 0 | 0 | 0 | 0 | 0 | 6 | 7 | 0 | 0 | 5 | 6 | 6 | 4 | 6 | 0 | 0 | 6 | 8 | 2 | 4 | 0 | **126** |
| Eastern Meadowlark | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **16** |
| Common Grackle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | **21** |
| Brown-headed Cowbird | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **18** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **9** |
| Purple Finch | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| House Finch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| American Goldfinch | 3 | 0 | 1 | 0 | 2 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 3 | 0 | 0 | 1 | 1 | 3 | 4 | 3 | 4 | 2 | 1 | 3 | 2 | 2 | 0 | 0 | **45** |
| **Total Birds:** | **22** | **45** | **24** | **18** | **39** | **16** | **29** | **29** | **17** | **31** | **31** | **24** | **21** | **16** | **13** | **17** | **18** | **25** | **21** | **7** | **12** | **26** | **25** | **34** | **25** | **19** | **6** | **13** | **18** | **29** | **22** | **24** | **2** | **718** |
| **Species Count:** | **12** | **16** | **12** | **8** | **19** | **9** | **13** | **11** | **11** | **11** | **15** | **9** | **15** | **11** | **10** | **12** | **12** | **12** | **10** | **6** | **5** | **12** | **12** | **15** | **11** | **6** | **5** | **9** | **6** | **9** | **14** | **13** | **1** | |
| **Total Species:** | **61** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## Table E-7 Ball Hill Project Area, Migratory Bird Survey by Location, 5/16/2008

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada Goose | 0 | 0 | 2 | 3 | 3 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | **25** |
| Mallard | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Wild Turkey | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **6** |
| Great Blue Heron | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Red-tailed Hawk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Kestrel | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Killdeer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **4** |
| Mourning Dove | 1 | 2 | 4 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **13** |
| Ruby-throated Hummingbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Red-bellied Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Yellow-bellied Sapsucker | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | **6** |
| Downy Woodpecker | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **5** |
| Hairy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Northern Flicker | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | **12** |
| Least Flycatcher | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Phoebe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Great Crested Flycatcher | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **6** |
| Eastern Kingbird | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **10** |
| Blue-headed Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Warbling Vireo | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **4** |
| Red-eyed Vireo | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **7** |
| Blue Jay | 2 | 1 | 0 | 0 | 0 | 3 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | **31** |
| American Crow | 1 | 3 | 5 | 2 | 4 | 5 | 3 | 2 | 2 | 4 | 5 | 0 | 3 | 0 | 3 | 4 | 0 | 5 | 4 | 0 | 4 | 4 | 5 | 3 | 2 | 2 | 1 | 4 | 0 | 5 | 3 | 3 | 0 | **91** |
| Tree Swallow | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | **10** |
| Barn Swallow | 0 | 3 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **22** |
| Black-capped Chickadee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | **10** |
| Red-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **3** |
| White-breasted Nuthatch | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| House Wren | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | **10** |
| Winter Wren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **2** |
| Ruby-crowned Kinglet | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eastern Bluebird | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **4** |
| Veery | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Wood Thrush | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | **11** |
| American Robin | 2 | 4 | 3 | 4 | 5 | 3 | 3 | 4 | 2 | 5 | 3 | 2 | 1 | 4 | 2 | 4 | 2 | 4 | 0 | 1 | 2 | 1 | 0 | 1 | 2 | 3 | 1 | 1 | 3 | 1 | 2 | 2 | 0 | **77** |
| Gray Catbird | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **5** |
| Brown Thrasher | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |

## Table E-7 Ball Hill Project Area, Migratory Bird Survey by Location, 5/16/2008

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blue-winged Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Nashville Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow Warbler | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | **19** |
| Chestnut-sided Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Magnolia Warbler | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Black-thr. Blue Warbler | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Yellow-rumped Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | **4** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | **5** |
| Blackburnian Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Bay-breasted Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Black-and-white Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Redstart | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **3** |
| Ovenbird | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | **8** |
| Common Yellowthroat | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **16** |
| Hooded Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| Scarlet Tanager | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Eastern Towhee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Chipping Sparrow | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | **24** |
| Field Sparrow | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | **8** |
| Savannah Sparrow | 3 | 0 | 3 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | **16** |
| Song Sparrow | 2 | 1 | 2 | 3 | 3 | 1 | 3 | 4 | 1 | 2 | 3 | 2 | 2 | 0 | 2 | 1 | 1 | 2 | 2 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 3 | 0 | 3 | 3 | 1 | 0 | **55** |
| Swamp Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| White-crowned Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Northern Cardinal | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **7** |
| Rose-breasted Grosbeak | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | **5** |
| Indigo Bunting | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| Bobolink | 2 | 6 | 4 | 2 | 2 | 0 | 3 | 0 | 0 | 6 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 1 | 0 | **42** |
| Red-winged Blackbird | 7 | 5 | 6 | 7 | 6 | 3 | 6 | 5 | 3 | 7 | 3 | 7 | 1 | 0 | 0 | 3 | 0 | 3 | 4 | 0 | 0 | 3 | 4 | 4 | 4 | 4 | 0 | 0 | 4 | 5 | 4 | 5 | 0 | **113** |
| Eastern Meadowlark | 2 | 2 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **12** |
| Common Grackle | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **15** |
| Brown-headed Cowbird | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | **24** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **8** |
| Purple Finch | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | **6** |
| House Finch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | **3** |
| American Goldfinch | 2 | 0 | 5 | 1 | 2 | 5 | 1 | 0 | 1 | 3 | 3 | 2 | 0 | 2 | 3 | 0 | 4 | 6 | 2 | 0 | 2 | 0 | 4 | 4 | 0 | 2 | 1 | 0 | 0 | 5 | 4 | 0 | 0 | **64** |
| **Total Birds:** | **32** | **36** | **44** | **34** | **44** | **37** | **30** | **29** | **24** | **37** | **36** | **30** | **26** | **23** | **26** | **32** | **19** | **41** | **28** | **10** | **19** | **19** | **19** | **24** | **22** | **14** | **14** | **18** | **13** | **33** | **29** | **36** | **7** | **885** |
| **Species Count:** | **17** | **17** | **18** | **16** | **22** | **20** | **15** | **13** | **17** | **12** | **20** | **17** | **19** | **15** | **16** | **20** | **14** | **17** | **16** | **9** | **12** | **8** | **8** | **11** | **13** | **7** | **11** | **10** | **7** | **12** | **14** | **22** | **6** | |
| **Total Species:** | **72** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Table E-8 Ball Hill Project Area, Breeding Bird Survey by Date**

| Species | 6/11/2007 | 6/26/2007 | Total |
|---|---|---|---|
| Mallard | 2 | 0 | **2** |
| Wild Turkey | 0 | 2 | **2** |
| Red-tailed Hawk | 3 | 2 | **5** |
| Killdeer | 3 | 3 | **6** |
| Ring-billed Gull | 0 | 1 | **1** |
| Mourning Dove | 9 | 15 | **24** |
| Black-billed Cuckoo | 1 | 1 | **2** |
| Yellow-billed Cuckoo | 1 | 3 | **4** |
| Yellow-bellied Sapsucker | 4 | 6 | **10** |
| Downy Woodpecker | 1 | 1 | **2** |
| Hairy Woodpecker | 1 | 0 | **1** |
| Northern Flicker | 2 | 1 | **3** |
| Pileated Woodpecker | 1 | 0 | **1** |
| Eastern Wood-Pewee | 1 | 6 | **7** |
| Acadian Flycatcher | 1 | 1 | **2** |
| Alder Flycatcher | 3 | 2 | **5** |
| Willow Flycatcher | 4 | 2 | **6** |
| Least Flycatcher | 1 | 0 | **1** |
| Eastern Phoebe | 0 | 1 | **1** |
| Great Crested Flycatcher | 1 | 1 | **2** |
| Eastern Kingbird | 0 | 3 | **3** |
| Blue-headed Vireo | 3 | 4 | **7** |
| Warbling Vireo | 2 | 2 | **4** |
| Red-eyed Vireo | 5 | 3 | **8** |
| Blue Jay | 4 | 4 | **8** |
| American Crow | 19 | 22 | **41** |
| Tree Swallow | 1 | 2 | **3** |
| Barn Swallow | 10 | 6 | **16** |
| Black-capped Chickadee | 3 | 3 | **6** |
| Red-breasted Nuthatch | 0 | 1 | **1** |
| White-breasted Nuthatch | 2 | 0 | **2** |
| House Wren | 3 | 8 | **11** |
| Golden-crowned Kinglet | 0 | 2 | **2** |
| Eastern Bluebird | 2 | 0 | **2** |
| Veery | 0 | 1 | **1** |
| Wood Thrush | 1 | 2 | **3** |
| American Robin | 2 | 9 | **11** |
| Gray Catbird | 3 | 7 | **10** |
| Cedar Waxwing | 5 | 13 | **18** |
| Blue-winged Warbler | 1 | 2 | **3** |
| Yellow Warbler | 5 | 4 | **9** |
| Chestnut-sided Warbler | 6 | 5 | **11** |
| Magnolia Warbler | 2 | 1 | **3** |
| Black-thr. Blue Warbler | 0 | 1 | **1** |

**Table E-8 Ball Hill Project Area, Breeding Bird Survey by Date**

| Species | 6/11/2007 | 6/26/2007 | Total |
|---|---|---|---|
| Black-thr. Green Warbler | 1 | 4 | **5** |
| Black-and-white Warbler | 0 | 1 | **1** |
| American Redstart | 2 | 2 | **4** |
| Ovenbird | 1 | 2 | **3** |
| Mourning Warbler | 1 | 3 | **4** |
| Common Yellowthroat | 18 | 16 | **34** |
| Hooded Warbler | 1 | 2 | **3** |
| Scarlet Tanager | 3 | 3 | **6** |
| Eastern Towhee | 0 | 3 | **3** |
| Chipping Sparrow | 3 | 9 | **12** |
| Field Sparrow | 6 | 6 | **12** |
| Savannah Sparrow | 12 | 22 | **34** |
| Grasshopper Sparrow | 1 | 0 | **1** |
| Song Sparrow | 9 | 15 | **24** |
| Northern Cardinal | 3 | 3 | **6** |
| Rose-breasted Grosbeak | 1 | 0 | **1** |
| Indigo Bunting | 9 | 12 | **21** |
| Bobolink | 22 | 27 | **49** |
| Red-winged Blackbird | 17 | 24 | **41** |
| Eastern Meadowlark | 2 | 7 | **9** |
| Common Grackle | 0 | 5 | **5** |
| Brown-headed Cowbird | 0 | 1 | **1** |
| Baltimore Oriole | 1 | 1 | **2** |
| American Goldfinch | 19 | 38 | **57** |
| **Total Birds:** | **250** | **359** | **609** |
| **Species Count:** | **56** | **60** | |
| **Total Species:** | **68** | | |

**Table E-9 Ball Hill Project Area, Breeding Bird Survey by Location, 6/11/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mallard | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **2** |
| Red-tailed Hawk | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | **3** |
| Killdeer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | **3** |
| Mourning Dove | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 3 | 0 | 0 | 1 | 0 | 0 | **9** |
| Black-billed Cuckoo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| Yellow-billed Cuckoo | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow-bellied Sapsucker | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **4** |
| Downy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **1** |
| Hairy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Northern Flicker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | **2** |
| Pileated Woodpecker | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Wood-Pewee | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Acadian Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Alder Flycatcher | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **3** |
| Willow Flycatcher | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | **4** |
| Least Flycatcher | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Great Crested Flycatcher | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Blue-headed Vireo | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **3** |
| Warbling Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | **2** |
| Red-eyed Vireo | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Blue Jay | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | **4** |
| American Crow | 0 | 2 | 1 | 3 | 2 | 4 | 0 | 2 | 1 | 1 | 1 | 0 | 2 | **19** |
| Tree Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **1** |
| Barn Swallow | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | **10** |
| Black-capped Chickadee | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | **3** |
| White-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **2** |
| House Wren | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | **3** |
| Eastern Bluebird | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **2** |
| Wood Thrush | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Robin | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Gray Catbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | **3** |
| Cedar Waxwing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | **5** |
| Blue-winged Warbler | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow Warbler | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | **5** |
| Chestnut-sided Warbler | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | **6** |
| Magnolia Warbler | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **2** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| American Redstart | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **2** |
| Ovenbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **1** |
| Mourning Warbler | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Common Yellowthroat | 2 | 2 | 1 | 0 | 2 | 3 | 2 | 2 | 2 | 0 | 1 | 0 | 1 | **18** |
| Hooded Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Scarlet Tanager | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **3** |
| Chipping Sparrow | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | **3** |
| Field Sparrow | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **6** |

**Table E-9 Ball Hill Project Area, Breeding Bird Survey by Location, 6/11/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Savannah Sparrow | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 1 | 0 | 4 | **12** |
| Grasshopper Sparrow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **1** |
| Song Sparrow | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | **9** |
| Northern Cardinal | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **3** |
| Rose-breasted Grosbeak | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| Indigo Bunting | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | **9** |
| Bobolink | 0 | 0 | 2 | 0 | 0 | 5 | 3 | 8 | 0 | 0 | 4 | 0 | 0 | **22** |
| Red-winged Blackbird | 0 | 0 | 4 | 0 | 1 | 5 | 3 | 0 | 0 | 0 | 4 | 0 | 0 | **17** |
| Eastern Meadowlark | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| American Goldfinch | 2 | 9 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | **19** |
| **Total Birds:** | **13** | **25** | **21** | **18** | **17** | **26** | **17** | **22** | **22** | **13** | **18** | **7** | **31** | **250** |
| **Species Count:** | **8** | **13** | **10** | **12** | **11** | **10** | **9** | **10** | **16** | **11** | **12** | **6** | **18** | |
| **Total Species:** | **56** | | | | | | | | | | | | | |

**Table E-10 Ball Hill Project Area, Breeding Bird Survey by Location, 6/26/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wild Turkey | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **2** |
| Red-tailed Hawk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | **2** |
| Killdeer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | **3** |
| Ring-billed Gull | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Mourning Dove | 0 | 0 | 1 | 1 | 2 | 3 | 1 | 2 | 1 | 0 | 3 | 0 | 1 | **15** |
| Black-billed Cuckoo | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow-billed Cuckoo | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | **3** |
| Yellow-bellied Sapsucker | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | **6** |
| Downy Woodpecker | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Northern Flicker | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Wood-Pewee | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | **6** |
| Acadian Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Alder Flycatcher | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **2** |
| Willow Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | **2** |
| Eastern Phoebe | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Great Crested Flycatcher | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Eastern Kingbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | **3** |
| Blue-headed Vireo | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **4** |
| Warbling Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **2** |
| Red-eyed Vireo | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Blue Jay | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | **4** |
| American Crow | 0 | 2 | 3 | 2 | 3 | 4 | 1 | 2 | 0 | 0 | 2 | 1 | 2 | **22** |
| Tree Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **2** |
| Barn Swallow | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | **6** |
| Black-capped Chickadee | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | **3** |
| Red-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| House Wren | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | **8** |
| Golden-crowned Kinglet | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **2** |
| Veery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Wood Thrush | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| American Robin | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | **9** |
| Gray Catbird | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | **7** |
| Cedar Waxwing | 1 | 3 | 2 | 3 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | **13** |
| Blue-winged Warbler | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Yellow Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 1 | **4** |
| Chestnut-sided Warbler | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | **5** |
| Magnolia Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Black-thr. Blue Warbler | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | **4** |
| Black-and-white Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Redstart | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Ovenbird | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Mourning Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | **3** |
| Common Yellowthroat | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 1 | 0 | 2 | 0 | 0 | **16** |

**Table E-10 Ball Hill Project Area, Breeding Bird Survey by Location, 6/26/2007**

| Species | A | B | C | D | E | F | G | H | I | J | K | L | M | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hooded Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **2** |
| Scarlet Tanager | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | **3** |
| Eastern Towhee | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | **3** |
| Chipping Sparrow | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | **9** |
| Field Sparrow | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **6** |
| Savannah Sparrow | 0 | 0 | 0 | 0 | 2 | 5 | 5 | 4 | 2 | 0 | 2 | 0 | 2 | **22** |
| Song Sparrow | 3 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | **15** |
| Northern Cardinal | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | **3** |
| Indigo Bunting | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | **12** |
| Bobolink | 0 | 0 | 0 | 0 | 0 | 7 | 2 | 3 | 13 | 0 | 0 | 0 | 2 | **27** |
| Red-winged Blackbird | 0 | 0 | 6 | 0 | 0 | 4 | 3 | 4 | 0 | 0 | 7 | 0 | 0 | **24** |
| Eastern Meadowlark | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | **7** |
| Common Grackle | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **5** |
| Brown-headed Cowbird | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **1** |
| American Goldfinch | 3 | 16 | 0 | 9 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 2 | 2 | **38** |
| **Total Birds:** | **18** | **37** | **31** | **30** | **26** | **37** | **25** | **36** | **26** | **16** | **40** | **14** | **23** | **359** |
| **Species Count:** | **11** | **13** | **16** | **17** | **17** | **15** | **15** | **20** | **11** | **13** | **22** | **11** | **16** | |
| **Total Species:** | **60** | | | | | | | | | | | | | |

**Table E-11 Ball Hill Project Area, Breeding Bird Survey by Location, June 11-12, 2008**

| Species | B | E | F | G | H | L | T1 | T2 | T3 | T8 | T14 | T17 | T21 | T25 | T33 | T34 | T35 | T40 | T42 | T43 | T56 | T58 | T60 | T61 | T64 | T66 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canada Goose | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Ring-necked Pheasant | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Wild Turkey | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Great Blue Heron | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| American Kestrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Killdeer | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Spotted Sandpiper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Woodcock | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Mourning Dove | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | **6** |
| Black-billed Cuckoo | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Yellow-billed Cuckoo | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Ruby-thr. Hummingbird | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow-bellied Sapsucker | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **6** |
| Downy Woodpecker | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Hairy Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **2** |
| Northern Flicker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **1** |
| Pileated Woodpecker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **2** |
| Eastern Wood-Pewee | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | **6** |
| Alder Flycatcher | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | **7** |
| Willow Flycatcher | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Least Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **1** |
| Great Crested Flycatcher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **5** |
| Eastern Kingbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | **1** |
| Blue-headed Vireo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | **2** |
| Warbling Vireo | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Red-eyed Vireo | 0 | 1 | 0 | 0 | 0 | 3 | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 1 | **23** |
| Blue Jay | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **9** |
| American Crow | 0 | 2 | 3 | 4 | 2 | 3 | 2 | 2 | 3 | 3 | 0 | 3 | 2 | 3 | 0 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 4 | 2 | **59** |
| Tree Swallow | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | **2** |
| Barn Swallow | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | **11** |

**Table E-11 Ball Hill Project Area, Breeding Bird Survey by Location, June 11-12, 2008**

| Species | B | E | F | G | H | L | T1 | T2 | T3 | T8 | T14 | T17 | T21 | T25 | T33 | T34 | T35 | T40 | T42 | T43 | T56 | T58 | T60 | T61 | T64 | T66 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-capped Chickadee | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | **13** |
| White-breasted Nuthatch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **2** |
| House Wren | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | **8** |
| Winter Wren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Eastern Bluebird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Veery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | **6** |
| Hermit Thrush | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | **2** |
| Wood Thrush | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **7** |
| American Robin | 3 | 1 | 3 | 3 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | 2 | 2 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 2 | 0 | 4 | **42** |
| Gray Catbird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **10** |
| Brown Thrasher | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | **4** |
| Cedar Waxwing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 3 | 0 | 0 | 0 | 0 | **15** |
| Blue-winged Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Nashville Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Yellow Warbler | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 2 | **20** |
| Chestnut-sided Warbler | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | **12** |
| Magnolia Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **1** |
| Yellow-rumped Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Black-thr. Green Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | **2** |
| Blackburnian Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| American Redstart | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | **5** |
| Ovenbird | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | **8** |
| Mourning Warbler | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **5** |
| Common Yellowthroat | 0 | 2 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 1 | 2 | **21** |
| Hooded Warbler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| Scarlet Tanager | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | **6** |
| Eastern Towhee | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **9** |
| Chipping Sparrow | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **8** |
| Field Sparrow | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **10** |
| Savannah Sparrow | 0 | 4 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 5 | 2 | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | **30** |
| Grasshopper Sparrow | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Song Sparrow | 3 | 2 | 4 | 0 | 1 | 2 | 1 | 5 | 3 | 1 | 0 | 2 | 0 | 1 | 3 | 1 | 0 | 0 | 2 | 2 | 2 | 3 | 0 | 0 | 4 | 2 | **44** |

**Table E-11 Ball Hill Project Area, Breeding Bird Survey by Location, June 11-12, 2008**

| Species | B | E | F | G | H | L | T1 | T2 | T3 | T8 | T14 | T17 | T21 | T25 | T33 | T34 | T35 | T40 | T42 | T43 | T56 | T58 | T60 | T61 | T64 | T66 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dark-eyed Junco | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | **3** |
| Rose-breasted Grosbeak | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | **9** |
| Indigo Bunting | 2 | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 1 | 3 | 0 | 2 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | **26** |
| Bobolink | 0 | 7 | 4 | 8 | 8 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 8 | 3 | 2 | 0 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 0 | 2 | 0 | **60** |
| Red-winged Blackbird | 3 | 6 | 6 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 2 | 0 | 0 | 0 | 4 | 4 | 3 | 0 | 0 | 0 | 3 | 4 | **49** |
| Eastern Meadowlark | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **9** |
| Common Grackle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| Brown-headed Cowbird | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | **10** |
| Baltimore Oriole | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | **3** |
| American Goldfinch | 0 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | **15** |
| **Total Birds:** | **18** | **32** | **36** | **30** | **31** | **29** | **19** | **22** | **28** | **23** | **9** | **29** | **28** | **30** | **25** | **17** | **16** | **19** | **22** | **32** | **28** | **34** | **22** | **23** | **29** | **22** | **653** |
| **Species Count:** | **10** | **12** | **17** | **11** | **16** | **18** | **14** | **13** | **18** | **15** | **7** | **20** | **10** | **17** | **17** | **13** | **11** | **14** | **12** | **14** | **13** | **17** | **15** | **15** | **15** | **12** | |
| **Total Species:** | **72** | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Table E-12 Proposed Turbine Locations, 2008 Breeding Bird Survey Points, and Habitat Description**

| Proposed Turbine Number | 2008 Breeding Bird Survey Point | 2007 Breeding Bird Survey Point | Habitat Type[1] | Description | Approximate Percent Cover | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Forest | Row Crop | Grassland | Reverting Field |
| 1 | Yes | No | Successional Field | Shrubby | 50% | 25% | 0% | 25% |
| 2 | Yes | No | Agricultural | Middle of ag. field, short hike from road | 25% | 50% | 0% | 25% |
| 3 | Yes | No | Successional Field | Edge of old field, woods | 50% | 25% | 0% | 25% |
| 4 | No | No | Agricultural | | | | | |
| 5 | No | No | Agricultural | | | | | |
| 6 | Yes | Yes (G) | Agricultural | Middle of ag. field | 25% | 50% | 25% | 0% |
| 7 | No | No | Agricultural | | | | | |
| 8 | Yes | No | Agricultural | Woods/ ag. edge | 75% | 0% | 25% | 0% |
| 9 | No | No | Beech/Maple Mesic | | | | | |
| 10 | No | No | Agricultural | | | | | |
| 11 | No | No | Hemlock-Northern Hardwoods | | | | | |
| 12 | No | No | Hemlock-Northern Hardwoods | | | | | |
| 13 | No | No | Successional Shrub | | | | | |

**Table E-12 Proposed Turbine Locations, 2008 Breeding Bird Survey Points, and Habitat Description**

| Proposed Turbine Number | 2008 Breeding Bird Survey Point | 2007 Breeding Bird Survey Point | Habitat Type[1] | Description | Approximate Percent Cover | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Forest | Row Crop | Grassland | Reverting Field |
| 14 | Yes | No | Hemlock-Northern Hardwoods | In woods | 50% | 25% | 0% | 25% |
| 15 | No | No | Hemlock-Northern Hardwoods | | | | | |
| 16 | No | No | Agricultural | | | | | |
| 17 | Yes | No | Agricultural | Middle of field | 25% | 0% | 50% | 25% |
| 18 | No | No | Agricultural | | | | | |
| 19 | Yes | Yes (F) | Successional Field | Middle of old field | 0% | 75% | 0% | 25% |
| 20 | No | No | Agricultural | | | | | |
| 21 | Yes | No | Agricultural | Middle of ag. field | 0% | 75% | 25% | 0% |
| 22 | No | No | Agricultural | | | | | |
| 23 | Yes | Yes (H) | Agricultural | South of woods edge in ag. field | 25% | 50% | 0% | 25% |
| 24 | No | No | Agricultural | | | | | |
| 25 | Yes | No | Successional Shrub | Shrub/woods edge | 50% | 25% | 0% | 25% |
| 26 | No | No | Agricultural | | | | | |
| 27 | No | No | Agricultural | | | | | |
| 29 | No | No | Agricultural | | | | | |
| 30 | Yes | Yes (E) | Agricultural | Middle of ag. Field | 0% | 75% | 25% | 0% |
| 31 | No | No | Agricultural | | | | | |

**Table E-12 Proposed Turbine Locations, 2008 Breeding Bird Survey Points, and Habitat Description**

| Proposed Turbine Number | 2008 Breeding Bird Survey Point | 2007 Breeding Bird Survey Point | Habitat Type[1] | Description | Approximate Percent Cover | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Forest | Row Crop | Grassland | Reverting Field |
| 32 | No | No | Agricultural | | | | | |
| 33 | Yes | No | Agricultural | Woods/ag. Edge | 25% | 75% | 0% | 0% |
| 34 | Yes | No | Beech/Maple Mesic | | 75% | 25% | 0% | 0% |
| 35 | Yes | No | Beech/Maple Mesic | | 25% | 50% | 25% | 0% |
| 36 | No | No | Beech/Maple Mesic | | | | | |
| 38 | No | No | Agricultural | | | | | |
| 39 | Yes | Yes (B) | Agricultural | Ag./forest edge near hedgerow | 25% | 50% | 0% | 25% |
| 40 | Yes | No | Hemlock-Northern Hardwoods | | 75% | 0% | 0% | 25% |
| 41 | No | No | Agricultural | | | | | |
| 42 | Yes | No | Agricultural | Ag./shrub/pond | 50% | 50% | 0% | 0% |
| 43 | Yes | No | Agricultural | Middle of ag. Field | 25% | 75% | 0% | 0% |
| 45 | No | No | Agricultural | | | | | |
| 46 | No | No | Agricultural | | | | | |
| 47 | No | No | Hemlock-Northern Hardwoods | | | | | |

**Table E-12 Proposed Turbine Locations, 2008 Breeding Bird Survey Points, and Habitat Description**

| Proposed Turbine Number | 2008 Breeding Bird Survey Point | 2007 Breeding Bird Survey Point | Habitat Type[1] | Description | Approximate Percent Cover | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Forest | Row Crop | Grassland | Reverting Field |
| 48 | No | No | Hemlock-Northern Hardwoods | | | | | |
| 49 | No | No | Hemlock-Northern Hardwoods | | | | | |
| 50 | No | No | Agricultural | | | | | |
| 51 | No | No | Successional Field | | | | | |
| 52 | No | No | Successional Field | | | | | |
| 53 | No | No | Successional Field | | | | | |
| 54 | Yes | Yes (L) | Successional Field | Woods/ag. Edge | 75% | 0% | 25% | 0% |
| 55 | No | No | Agricultural | | | | | |
| 56 | Yes | No | Agricultural | Ag./ forest edge | 75% | 0% | 25% | 0% |
| 57 | No | No | Agricultural | | | | | |
| 58 | Yes | No | Agricultural | Reverting ag. Field | 50% | 0% | 50% | 0% |
| 59 | No | No | Beech/Maple Mesic | | | | | |
| 60 | Yes | No | Beech/Maple Mesic | | 100% | 0% | 0% | 0% |

**Table E-12 Proposed Turbine Locations, 2008 Breeding Bird Survey Points, and Habitat Description**

| Proposed Turbine Number | 2008 Breeding Bird Survey Point | 2007 Breeding Bird Survey Point | Habitat Type[1] | Description | Approximate Percent Cover | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Forest | Row Crop | Grassland | Reverting Field |
| 61 | Yes | No | Hemlock-Northern Hardwoods | Wood/ag. Edge | 75% | 0% | 0% | 25% |
| 62 | No | No | Hemlock-Northern Hardwoods | | | | | |
| 64 | Yes | No | Agricultural | Wood/ag. Edge | 50% | 25% | 25% | 0% |
| 65 | No | No | Agricultural | | | | | |
| 66 | Yes | No | Agricultural | Field/hardwood edge | 25% | 25% | 25% | 25% |
| 67 | No | No | Hemlock-Northern Hardwoods | | | | | |

[1] As per Ecological Communities on DEIS Figure 2.9-1

**Table E-13 Summary of Habitat Types Based on Aerial Photograph Interpretation, Ball Hill 2008 Breeding Bird Surveys**

| Habitat Type | Number of Points with | | | |
|---|---|---|---|---|
| | 100% Cover | 75% Cover | 50% Cover | 25% Cover |
| Forest | 1 | 6 | 7 | 9 |
| Row Crop | 0 | 5 | 6 | 7 |
| Grassland | 0 | 0 | 2 | 9 |
| Reverting Field | 0 | 0 | 0 | 12 |

**Table E-14 Ball Hill Breeding Bird Survey Locations (2008) with Global Positioning System Coordinates and Nearest Road**

| Turbine Number Survey Point | Easting | Northing | Nearest Road |
|---|---|---|---|
| 1 | 989014.62 | 879207.52 | Zahm Road |
| 2 | 990883.11 | 878496.56 | Round Top Road |
| 3 | 998215.51 | 878356.01 | Round Top Road |
| 6 (G) | 991348.23 | 8748641.7 | Round Top Road |
| 8 | 993268.68 | 873639.16 | Round Top Road |
| 14 | 995474.01 | 869654.64 | Villenova Road |
| 17 | 997459.15 | 869455.89 | Villenova Road |
| 19 (F) | 996927.55 | 868936.92 | Pope Hill Road |
| 21 | 997921.88 | 875386.13 | Pope Hill Road |
| 23 (H) | 988189.63 | 875082.24 | Pope Hill Road |
| 25 | 998215.51 | 878356.01 | Pope Hill Road |
| 30 (E) | 999181.04 | 873250.03 | Prospect Road |
| 33 | 1003559.07 | 875826.43 | Prospect Road |
| 34 | 1003299.57 | 874663.73 | Prospect Road |
| 35 | 1004414.63 | 874070.63 | Prospect Road |
| 39 (B) | 994610.47 | 881999.04 | Prospect Road |
| 40 | 1007329.42 | 874886.85 | Prospect Road |
| 42 | 1005764.12 | 876650.49 | Prospect Road |
| 43 | 1005359.79 | 877629.53 | Prospect Road |
| 54 (L) | 1000173.42 | 882071.76 | Hurlburt Road |
| 56 | 1005883.33 | 888427.63 | Hurlburt Road |
| 58 | 1003089.07 | 890116.50 | Hurlburt Road |
| 60 | 1005980.63 | 890531.91 | Route 39 |
| 61 | 1007869.79 | 892850.89 | Route 39 |
| 64 | 1004448.52 | 894050.50 | Route 39 |
| 66 | 1006641.30 | 895529.61 | Route 39 |

# F

# Bird and Bat Fatality Rates from Post-construction Studies

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| **Studies in the United States** | | | | | |
| **West** | | | | | |
| Altamont Pass, California | Grassland/pasture | 11 months (1988-1989) | 359 (7,340) | ~0.13 (42 birds total[e]) | Howell and DiDonato 1991 in Erickson et al. 2001 |
| | | 11 months (1990-1991) | 150 (7,340) | ~0.07 (10 birds total[e]) | Howell et al. 1991b in Erickson et al. 2001 |
| | | (1989-1991) | 1,169 (7,340) | ~0.08 (182 birds total[e]) | Orloff and Flannery 1992 in Erickson et al. 2001 |
| | | One-time search (1994) | 1,169 (7,340) | NA (20 birds total[e]) | Orloff and Flannery 1996 in Erickson et al. 2001 |
| | | 20 months (1993-1995) | 165 (NA) | ~0.26 (72 birds total[e]) | Howell 1997 in Erickson et al. 2001 |
| | | 23 months (1993-1995) | 785 (5,400) | ~0.17 (256 birds total[e]) | Thelander 2000 in Erickson et al. 2001 |
| | | 12-30 months (1998-2000) | 685-1,110 (NA) | 0.19 | Thelander 2003 |
| Montezuma Hills, California | Grassland/pasture | 25 months (1990-1992) | 237 (600) | 0.07[b] | Howell and Noone 1992 in Erickson et al. 2001 and in GAO 2005 |
| | | 10 months (1994-1995) | 76 (NA) | ~0.21 (13 birds total[e]) | Howell 1997 in Erickson et al. 2001 |
| San Gorgonio, California | Grassland/pasture | (1985) | 2,900 (2,947) | 2.31 | McCrary et al. 1986a in Erickson et al. 2001, 2002 |
| | | 14 months (1997-1998) | ~360 (NA) | NA (42 birds total[e]) | Anderson 2000a in Erickson et al. 2001 |
| Tehachapi Pass, California | NA | 36 months (1995-1998) | 640-760 (NA) | NA (147 birds total[e]) | Anderson 2000b in Erickson et al. 2001 |
| Ponnequin, Colorado | Grassland/agriculture | 24 months (1998-2000) | 29 (29) | ~0.16 (9 birds total[e]) | Kerlinger et al. 2000a, b in Erickson et al. 2001 |
| | | 60 months | 29 (44) | 0.11 | Kerlinger and Kerns 2003 |
| Klondike (Phase I), Oregon | Grassland/agriculture/CRP | 12 months (2002-2003) | 16 | 1.42 | Johnson et al. 2003 |
| Combine Hills, Oregon | Grassland/agriculture/CRP | 12 months (2004-2005) | 41 (41) | 2.56 | Young et al. 2005 |
| Vansycle/Stateline, Oregon/ Washington | Grassland/agriculture/CRP | 12 months (1999) | 38 (38) | 0.63 | Erickson et al. 2000 |
| Stateline, Washington/Oregon | Grassland/agriculture/CRP | 24 months (2002-2003) | 124-153 (454) | 1.93 | Erickson et al. 2004 |
| Nine Canyon, Washington | Grassland/agriculture/CRP | 11 months (2002-2003) | 37 (37) | 3.59 | Erickson et al. 2003 |
| Foote Creek Rim, Wyoming | | | | | |
| Phase I | Short-grass prairie | 25 months (1998-2000) | 69 (69) | 1.50 | Young et al. 2001 |
| Phase II | | 17 months (1999-2000) | 36 (36) | 1.49 | Young et al. 2003 |
| **Midwest** | | | | | |
| Top of Iowa, Iowa | Agriculture | 8 months (2003) | 26 (89) | 1.29 | Koford et al. 2004 |
| Iowa Distributed Wind Generation Project, Algona, Iowa | Grassland/agriculture | 9 months[d] (1999-2000) | 3 (3) | 0.00 | Demastes and Trainer 2000 in Erickson et al. 2001 |
| Buffalo Ridge, Minnesota | | | | | |
| Phase I | Grassland/agriculture | 8 months (1994-1995) | 50 (73) | 0.98 | Johnson et al. 2002 |
| Phase I | | 44 months[c] (1996-1999) | 21 (73) | 0.98 | Johnson et al. 2000b in Erickson et al. 2001 |
| Phase II | | 20 months[c] (1998-1999) | 40 (143) | 2.27 | Johnson et al. 2002 |
| Phase III | | 8 months[c] (1999) | 30 (138) | 4.45 | Johnson et al. 2002 |
| Summary Buffalo Ridge - Weighted average (all phases) | | | ~35 (~107) | 2.83 | Erickson et al. 2001 |
| Lincoln, Wisconsin | Agriculture | (1998-2000; 3 migration seasons fall and spring) | 31 (31) | 1.30 | Howe et al. 2002 |

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| **Northeast** | | | | | |
| Madison County, New York | Mixed (agriculture and forest) | 12 months | 7 (7) | ~0.42 (4 birds total[e]) | Kerlinger 2002 in Kelinger and Guarnaccia 2003 |
| Maple Ridge, New York | | | | | |
| daily surveys | Mixed (agriculture and forest) | 5 months (2006) | 50 (120) | 9.59 | Jain et al. 2007 |
| 3-day surveys | Mixed (agriculture and forest) | 5 months (2006) | 50 (120) | 4.47 | Jain et al. 2007 |
| weekly surveys | Mixed (agriculture and forest) | 5 months (2006) | 50 (120) | 3.13 | Jain et al. 2007 |
| Maple Ridge, New York | Mixed (agriculture and forest) | 7 months (2007) | 64 (195) | 5.67 | Jain et al. 2008 |
| Steel Winds, Lackawanna, New York | Coastal (industrial land) | 16 surveys in 7 months (2007) | 8 (8) | NA (5 birds total[e]) | Grehan 2008 |
| Wethersfield, Wyoming County, New York | Mixed (agriculture and forest) | 5 months[f] (2005) | 10 (10) | 0.00 | E & E 2006 |
| Green Mountains, Searsburg, Vermont | Forested mountain | 4 months (1997) | 11 (11) | 0.00 | Kerlinger and Kerns 2003 |
| **Mid-Atlantic Highlands** | | | | | |
| Meyersdale, Somerset County, Pennsylvania | Grassland/agriculture | 7 months (2000) | 8 (8) | 0.00 | Kerlinger 2000 in Erickson et al. 2001 |
| Buffalo Mountain, Tenneesee | Mountainous forested ridges and strip mines | 11 months (2001-2002) | 3 (3) | 7.70 | Nicholson 2003 |
| Mountaineer, West Virginia | Mixed (agriculture and forest), mountainous | 7 months[g] (2003) | 44 (44) | 4.04[h] | Kerns and Kerlinger 2004 |
| **Canadian Studies** | | | | | |
| **Ontario** | | | | | |
| Erie Shores, Port Burwell, Ontario | mixed; near coast | 12 months (2006 - 2007) | 66 | 2 - 2.5 (approx) | James 2008 |
| Huron Wind | Mixed (agriculture and forest) | 2003 (April to Oct) | 5 (5) | 0.00 | E & E 2004, Parker 2000 |
| Canadian Exhibition Place Toronto | Urban | Spring and fall 2002 | 1 (1) | 2.00 | James and Coady 2003 |
| **European Studies** | | | | | |
| **Belgium** | | | | | |
| Zeebrugge | Coastal port | 12 months | 23 | ~2.39 (55 birds total[e]) | Everaert et al. 2002 in BirdLife 2003 |
| **Netherlands** | | | | | |
| Oosterbierum | Coastal agriculture and | Fall | 18 | 0.06 | Winkelman 1994 |
| | marshes/water | Spring | 18 | 0.09 | |
| Urk | Coastal agriculture and | Fall | 25 | 0.04 | Winkelman 1994 |
| | marshes/water | Spring | 25 | 0.05 | |
| Kreekrak | Coastal | NA | 5 (26) | 0.01[a] | Musters et al. 1995, 1996 in BirdLife 2003 |
| **Spain** | | | | | |
| Tarifa, Andalusia Region | | | | | |
| Pesur | Mountain ridges generally | ~20 years | 190 (190) | 0.15 | SEO/BirdLife 1995 in BirdLife 2002, 2003 |
| E3 | without vegetation. | 20 years | 66 (66) | 0.03 | |
| Total Pesur and E3 | | | 256 | NA | Barrios and Rodriguez 2004 |
| Salajones, Navarra Region | Mountainous forests and agriculture | NA | 33 (33) | 13.36 | Lekouna 2001 in BirdLife 2003 |
| El Perdon, Navarra Region | Mountainous forests and agriculture | NA | 40 (40) | 63.90 | Lekouna 2001 in BirdLife 2003 |

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| **United Kingdom** | | | | | |
| Blyth | Coastal habitats | 30 months | 9 | 1.34 | Still et al. 1996 in BirdLife 2003 |

Source: Table based on tables from the National Academy of Sciences (2007) and additional references.

Key:
CRP = Conservation Reserve Program.
NA = Not available.

Notes:
[a] Predicted values.
[b] Not adjusted for searcher efficiency or scavaging rate.
[c] Surveys not conducted during winter months
[d] Surveys conducted during fall, winter, spring months
[e] Number of birds/turbine/year not provided, only the total number of fatalities; an approximation was calculated based on the values available and scavenger/searcher efficiency was not taken into account.
[f] Survey conducted in spring and fall, during migration.
[g] Spring and fall migration and summer breeding season
[h] Fatalities for 7 month study period

**Table F-2 Bat Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bat Fatalities/ Turbine/Year | Reported Mortality Rate Number of Bat Fatalities/ MW/Year | Reference |
|---|---|---|---|---|---|
| **Studies in the United States** | | | | | |
| **West** | | | | | |
| Altamont Pass | Grassland/pasture | NA | NA | 0.0 | Smallwood and Neher 2004 in GAO 2005 |
| High Winds, California | Grassland/agriculture | NA | NA | 2.0 | Kerlinger et al. 2006 |
| Vansycle/Stateline, Oregon/ Washington | Grassland/agriculture | 12 months (1999) | 0.74 | 1.1 | Erickson et al. 2000 |
| Stateline, Washington/Oregon | Shrubland/agriculture | 24 months (2002-2003) | 1.12 | 1.7 | Erickson et al. 2003 |
| Nine Canyon, Washington | Grassland/agriculture/ | 11 months (2002-2003) | 3.21 | 2.5 | Erickson et al. 2003 |
| Klondike (Phase I), Oregon | Grassland/agriculture/CRP | 12 months (2002-2003) | 1.16 | 0.8 | Johnson et al. 2003 |
| Foote Creek Rim, Wyoming | Short-grass prairie | NA | 1.34 | 2.0 | Yount et al. 2003, Gruver 2002 |
| **Midwest** | | | | | |
| Top of Iowa, Iowa | Agriculture | 8 months (2003) | 1.88[d] | 8.6 | Jain 2005 |
| Buffalo Ridge, Minnesota | | | | | |
| (Phase I) | Grassland/agriculture/CRP | 8 months (1994-1995) | 0.26 | 0.8 | Osborn et al. 2003 |
| (Phase II) | | (1996-1999) | 1.78 | 2.5 | Johnson et al. 2003 |
| (Phase III) | | (2001-2002) | 2.04 | 2.9 | Johnson et al. 2004 |
| Lincoln, Wisconsin | Agriculture | (1998-2000; 3 migration seasons fall and spring) | 4.26 | 6.5 | Howe et al. 2002 |
| **Northeast** | | | | | |
| Maple Ridge, New York | | | | | |
| daily surveys | Mixed (agriculture and forest) | 5 months (2006) | 24.53 | 14.87 | Jain et al. 2007 |
| 3-day surveys | Mixed (agriculture and forest) | 5 months (2006) | 22.34 | 13.54 | Jain et al. 2007 |
| weekly surveys | Mixed (agriculture and forest) | 5 months (2006) | 15.20 | 9.21 | Jain et al. 2007 |
| Maple Ridge, New York | Mixed (agriculture and forest) | 7 months (2007) | 15.54 | 9.42 | Jain et al. 2008 |
| Steel Winds, Lackawanna, New York | Coastal (industrial land) | 16 surveys in 7 months (2007) | NA (48 bats total[g]) | NA | Grehan 2008 |
| Wethersfield, Wyoming County, New York | Mixed (agriculture and forest) | 5 months[h] (2005) | ~0.96 (4 bats total[g]) | NA | E & E 2006 |
| Erie Shores, Port Burwell, Ontario | mixed; near coast | 12 months (2006 - 2007) | 2 - 2.5 (approx) | NA | James 2008 |
| **Mid-Atlantic Highlands** | | | | | |
| Meyersdale, Somerset County, Pennsylvania | Deciduous forested ridge | 1.5 months (2004) | 23.00[c] | 15.3 | Kerns et al. 2005 |
| Buffalo Mountain, Tenneesee | | | | | |
| Phase I | Deciduous forested ridge | 11 months (2001-2002) | NA | 31.5 | Fiedler 2004 |
| Phase II | | NA | 20.80 | 41.1 | TVA, unpublished data |

**Table F-2 Bat Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Reported Mortality Rate (Adjusted for Searcher Efficiency) | Reported Mortality Rate | Reference |
|---|---|---|---|---|---|
| | | | Number of Bat Fatalities/ Turbine/Year | Number of Bat Fatalities/ MW/Year | |
| Mountaineer, West Virginia | Deciduous forested ridge | 7 months (2003; spring and fall migration and summer breeding season) | 47.53[e] | 32.0 | Kerns et al. 2005 |
| | | 1.5 months (2004) | 38.00[c] | 25.3 | Kerns and Kerlinger 2004, Kerns et al. 2005 |
| **Southwest** | | | | | |
| Oklahoma Wind Energy Center, Oklahoma | Grassland/agriculture/ shrubland | NA | NA | 0.8 | Piorkowski 2006 |

Source: Table based on tables from the National Academy of Sciences (2007) and additional references.

Key:
CRP = Conservation Reserve Program
NA = Not available

Notes:
[a] Predicted values.
[b] Not adjusted for searcher efficiency or scavaging rate
[c] Represents fatality rate for 6-week study period
[d] Represents fatality rate for 8-month study period
[e] Fatalities for 7 month study period
[f] Fatalities for 5 month study period; a range is provided based on the search schedules (1-day, 3-day, and 7-day)
[g] Number of bats/turbine/year not provided, only the total number of fatalities; an approximation was calculated based on the values available and scavenger/searcher efficiency was not taken into account.
[h] Survey conducted in spring and fall, during migration.

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| **Studies in the United States** | | | | | |
| **West** | | | | | |
| Altamont Pass, California | Grassland/pasture | 11 months (1988-1989) | 359 (7,340) | ~0.13 (42 birds total[e]) | Howell and DiDonato 1991 in Erickson et al. 2001 |
| | | 11 months (1990-1991) | 150 (7,340) | ~0.07 (10 birds total[e]) | Howell et al. 1991b in Erickson et al. 2001 |
| | | (1989-1991) | 1,169 (7,340) | ~0.08 (182 birds total[e]) | Orloff and Flannery 1992 in Erickson et al. 2001 |
| | | One-time search (1994) | 1,169 (7,340) | NA (20 birds total[e]) | Orloff and Flannery 1996 in Erickson et al. 2001 |
| | | 20 months (1993-1995) | 165 (NA) | ~0.26 (72 birds total[e]) | Howell 1997 in Erickson et al. 2001 |
| | | 23 months (1993-1995) | 785 (5,400) | ~0.17 (256 birds total[e]) | Thelander 2000 in Erickson et al. 2001 |
| | | 12-30 months (1998-2000) | 685-1,110 (NA) | 0.19 | Thelander 2003 |
| Montezuma Hills, California | Grassland/pasture | 25 months (1990-1992) | 237 (600) | 0.07[b] | Howell and Noone 1992 in Erickson et al. 2001 and in GAO 2005 |
| | | 10 months (1994-1995) | 76 (NA) | ~0.21 (13 birds total[e]) | Howell 1997 in Erickson et al. 2001 |
| San Gorgonio, California | Grassland/pasture | (1985) | 2,900 (2,947) | 2.31 | McCrary et al. 1986a in Erickson et al. 2001, 2002 |
| | | 14 months (1997-1998) | ~360 (NA) | NA (42 birds total[e]) | Anderson 2000a in Erickson et al. 2001 |
| Tehachapi Pass, California | NA | 36 months (1995-1998) | 640-760 (NA) | NA (147 birds total[e]) | Anderson 2000b in Erickson et al. 2001 |
| Ponnequin, Colorado | Grassland/agriculture | 24 months (1998-2000) | 29 (29) | ~0.16 (9 birds total[e]) | Kerlinger et al. 2000a, b in Erickson et al. 2001 |
| | | 60 months | 29 (44) | 0.11 | Kerlinger and Kerns 2003 |
| Klondike (Phase I), Oregon | Grassland/agriculture/CRP | 12 months (2002-2003) | 16 | 1.42 | Johnson et al. 2003 |
| Combine Hills, Oregon | Grassland/agriculture/CRP | 12 months (2004-2005) | 41 (41) | 2.56 | Young et al. 2005 |
| Vansycle/Stateline, Oregon/ Washington | Grassland/agriculture/CRP | 12 months (1999) | 38 (38) | 0.63 | Erickson et al. 2000 |
| Stateline, Washington/Oregon | Grassland/agriculture/CRP | 24 months (2002-2003) | 124-153 (454) | 1.93 | Erickson et al. 2004 |
| Nine Canyon, Washington | Grassland/agriculture/CRP | 11 months (2002-2003) | 37 (37) | 3.59 | Erickson et al. 2003 |
| Foote Creek Rim, Wyoming | | | | | |
| Phase I | Short-grass prairie | 25 months (1998-2000) | 69 (69) | 1.50 | Young et al. 2001 |
| Phase II | | 17 months (1999-2000) | 36 (36) | 1.49 | Young et al. 2003 |
| **Midwest** | | | | | |
| Top of Iowa, Iowa | Agriculture | 8 months (2003) | 26 (89) | 1.29 | Koford et al. 2004 |
| Iowa Distributed Wind Generation Project, Algona, Iowa | Grassland/agriculture | 9 months[d] (1999-2000) | 3 (3) | 0.00 | Demastes and Trainer 2000 in Erickson et al. 2001 |

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| Buffalo Ridge, Minnesota | | | | | |
| Phase I | Grassland/agriculture | 8 months (1994-1995) | 50 (73) | 0.98 | Johnson et al. 2002 |
| Phase I | | 44 months[c] (1996-1999) | 21 (73) | 0.98 | Johnson et al. 2000b in Erickson et al. 2001 |
| Phase II | | 20 months[c] (1998-1999) | 40 (143) | 2.27 | Johnson et al. 2002 |
| Phase III | | 8 months[c] (1999) | 30 (138) | 4.45 | Johnson et al. 2002 |
| Summary Buffalo Ridge - Weighted average (all phases) | | | ~35 (~107) | 2.83 | Erickson et al. 2001 |
| Lincoln, Wisconsin | Agriculture | (1998-2000; 3 migration seasons fall and spring) | 31 (31) | 1.30 | Howe et al. 2002 |
| **Northeast** | | | | | |
| Madison County, New York | Mixed (agriculture and forest) | 12 months | 7 (7) | ~0.42 (4 birds total[e]) | Kerlinger 2002 in Kelinger and Guarnaccia 2003 |
| Maple Ridge, New York | | | | | |
| daily surveys | Mixed (agriculture and forest) | 5 months (2006) | 50 (120) | 9.59 | Jain et al. 2007 |
| 3-day surveys | Mixed (agriculture and forest) | 5 months (2006) | 50 (120) | 4.47 | Jain et al. 2007 |
| weekly surveys | Mixed (agriculture and forest) | 5 months (2006) | 50 (120) | 3.13 | Jain et al. 2007 |
| Maple Ridge, New York | Mixed (agriculture and forest) | 7 months (2007) | 64 (195) | 5.67 | Jain et al. 2008 |
| Steel Winds, Lackawanna, New York | Coastal (industrial land) | 16 surveys in 7 months (2007) | 8 (8) | NA (5 birds total[e]) | Grehan 2008 |
| Wethersfield, Wyoming County, New York | Mixed (agriculture and forest) | 5 months[f] (2005) | 10 (10) | 0.00 | E & E 2006 |
| Green Mountains, Searsburg, Vermont | Forested mountain | 4 months (1997) | 11 (11) | 0.00 | Kerlinger and Kerns 2003 |
| **Mid-Atlantic Highlands** | | | | | |
| Meyersdale, Somerset County, Pennsylvania | Grassland/agriculture | 7 months (2000) | 8 (8) | 0.00 | Kerlinger 2000 in Erickson et al. 2001 |
| Buffalo Mountain, Tenneesee | Mountainous forested ridges and strip mines | 11 months (2001-2002) | 3 (3) | 7.70 | Nicholson 2003 |
| Mountaineer, West Virginia | Mixed (agriculture and forest), mountainous | 7 months[g] (2003) | 44 (44) | 4.04[h] | Kerns and Kerlinger 2004 |
| **Canadian Studies** | | | | | |
| **Ontario** | | | | | |
| Erie Shores, Port Burwell, Ontario | mixed; near coast | 12 months (2006 - 2007) | 66 | 2 - 2.5 (approx) | James 2008 |
| Huron Wind | Mixed (agriculture and forest) | 2003 (April to Oct) | 5 (5) | 0.00 | E & E 2004, Parker 2000 |
| Canadian Exhibition Place Toronto | Urban | Spring and fall 2002 | 1 (1) | 2.00 | James and Coady 2003 |
| **European Studies** | | | | | |
| **Belgium** | | | | | |
| Zeebrugge | Coastal port | 12 months | 23 | ~2.39 (55 birds total[e]) | Everaert et al. 2002 in BirdLife 2003 |
| **Netherlands** | | | | | |

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| Oosterbierum | Coastal agriculture and | Fall | 18 | 0.06 | Winkelman 1994 |
| | marshes/water | Spring | 18 | 0.09 | |
| Urk | Coastal agriculture and | Fall | 25 | 0.04 | Winkelman 1994 |
| | marshes/water | Spring | 25 | 0.05 | |
| Kreekrak | Coastal | NA | 5 (26) | 0.01[a] | Musters et al. 1995, 1996 in BirdLife 2003 |

**Table F-1 Bird Fatality Rates from Post-construction Studies at Wind Energy Facilities**

| Wind Project and Location | Habitat | Length of Monitoring | Number of Turbines in Study in Project (Number in Project) | Reported Mortality Rate (Adjusted for Searcher Efficiency) Number of Bird Fatalities/Turbine/Year | Reference |
|---|---|---|---|---|---|
| **Spain** | | | | | |
| Tarifa, Andalusia Region | | | | | |
| Pesur | Mountain ridges generally | ~20 years | 190 (190) | 0.15 | SEO/BirdLife 1995 in BirdLife 2002, 2003 |
| E3 | without vegetation. | 20 years | 66 (66) | 0.03 | |
| Total Pesur and E3 | | | 256 | NA | Barrios and Rodriguez 2004 |
| Salajones, Navarra Region | Mountainous forests and agriculture | NA | 33 (33) | 13.36 | Lekouna 2001 in BirdLife 2003 |
| El Perdon, Navarra Region | Mountainous forests and agriculture | NA | 40 (40) | 63.90 | Lekouna 2001 in BirdLife 2003 |
| **United Kingdom** | | | | | |
| Blyth | Coastal habitats | 30 months | 9 | 1.34 | Still et al. 1996 in BirdLife 2003 |

Source: Table based on tables from the National Academy of Sciences (2007) and additional references.

Key:
CRP = Conservation Reserve Program.
NA = Not available.

Notes:
[a] Predicted values.
[b] Not adjusted for searcher efficiency or scavaging rate.
[c] Surveys not conducted during winter months
[d] Surveys conducted during fall, winter, spring months
[e] Number of birds/turbine/year not provided, only the total number of fatalities; an approximation was calculated based on the values available and scavenger/searcher efficiency was not taken into account.
[f] Survey conducted in spring and fall, during migration.
[g] Spring and fall migration and summer breeding season
[h] Fatalities for 7 month study period

# G Work Plan for Post-Construction Bird and Bat Mortality Monitoring

# Work Plan for Bird and Bat Post-construction Studies at the Ball Hill Windpark Towns of Villenova and Hanover, Chautauqua County, New York

**July 2008**

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# List of Abbreviations and Acronyms

| | |
|---|---|
| amsl | above mean sea level |
| DEIS | Draft Environmental Impact Statement |
| E & E | Ecology and Environment, Inc. |
| GE | General Electric |
| GPS | global positioning system |
| kV | kilovolt |
| MTS | modular tower system |
| MW | megawatt |
| Noble | Noble Environmental Power, LLC |
| NWS | National Weather Service |
| NYSDEC | New York State Department of Environmental Conservation |
| ROW | right-of-way |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geologic Survey |

# 1 Project Background and Study Area

## 1.1 Project Description

Noble Ball Hill Windpark, LLC (Noble) is proposing to construct and operate a wind energy facility (the Project) in the Towns of Villenova and Hanover, Chautauqua County, located in western New York State (see Figure 1-1). The project consists of generation and transmission components.

### 1.1.1 Ball Hill Project Area

Currently, the Project will include the following:

- Installation and operation of 60 wind turbines (49 in the Town of Villenova and 11 in the Town of Hanover) with a capacity of 90 megawatts (MW) within an approximately 13,658 acre Project Area in the Towns of Villenova and Hanover;
- Construction and use of approximately 16 miles of access roads (13 miles in the Town of Villenova and three miles in the Town of Hanover) that will connect each wind turbine to a Town or County roadway to allow equipment and vehicle access for construction and subsequent maintenance of the facilities;
- Construction and use of an electrical collection system (23.8 miles) that will allow delivery of electricity to a new substation to be constructed in the Town of Hanover. Nearly the entire collection system will be installed underground. One hundred seventy four feet of overhead collection line will be installed in the Town of Villenova;
- Construction and use of a new substation (Hanover substation) within the Project Area in the Town of Hanover that will tie into a new 115-kilovolt (kV) transmission line. The substation footprint will be approximately 200 by 300 feet. The substation will be located on and have direct access to Hurlbert Road;
- Construction and use of a switchyard within the Project Area in the Town of Hanover. The switchyard footprint will be approximately 300 by 500 feet.

The switchyard will be located on and have direct access to Bennett State Road (County Route 85); and

- Construction and use of a 5.95-mile overhead 115-kV transmission line, sited within the Town of Hanover to transfer the energy from the new substation to the new switchyard. The proposed switchyard will provide connection to existing 230-kV National Grid transmission line which provides access to the grid.

### 1.1.2 Turbine Description

The wind turbines that will be installed at the Windpark will be General Electric (GE) 1.5-MW, Model sle, 80-meter, modular tower system (MTS), T-Flange wind turbine generators[1]. The turbine is a three-bladed, upwind, horizontal-axis wind turbine with a rotor diameter of 253 feet (77 meters) (see Figure 1-2). The nacelle is located at the top of each tower and contains the electrical generating equipment. The turbine rotor and nacelle are mounted on top of a tubular tower, giving a rotor hub height of 263 feet (80 meters) (see Figure 1-2). The maximum height for the turbine is 389 feet (118.5 meters) when a rotor blade is at the top of its rotation. Once installed, each wind turbine will occupy a round, slightly exposed base approximately 18 feet (5.5 meters) in diameter.

## 1.2 Permitting Requirements

This work plan for bird and bat post-construction mortality studies was prepared by Ecology and Environment, Inc. (E & E) as part of the draft Environmental Impact Statement (DEIS) (E & E 2008) to address anticipated requirements that will be incorporated into the New York State Department of Environmental Conservation (NYSDEC), Article 15 and Article 24 permitting and U.S. Army Corps of Engineers, Section 404 and Section 10 permitting for the Project. It should be noted that NYSDEC is likely to require an overarching adaptive management strategy for evaluating actual impacts associated with the operation of the Project. As such, the methodology as outlined here is a pilot study of methods to be used in subsequent years of the post-construction studies. In consultation with NYSDEC, the scope may be revised to either increase or reduce the scope of the study, based on the number of carcasses retrieved in relation to the actual number of hours/days searched, weather conditions, carcass removal rates, searcher efficiencies, or other parameters viewed as relevant following yearly review of the data. Any changes to the work plan will be made in writing and agreed to by both NYSDEC and Noble.

[1] 1.5MW refers to the production capacity of the turbine, which is 1.5 megawatts. The nomenclature “sle” is used to designate that the diameter size of the turbine rotor is 253 feet. 80-meter refers to the height of the tower. MTS (Modular Tower System) designates the type of tower configuration, and T-Flange designates the type of flange used to connect the tower directly to the foundation.

NYSDEC issued draft Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects ("Draft Guidelines") for public comment in January 2008 (NYSDEC 2008). Noble recognizes that issuance of a final NYSDEC guidance document regarding post- construction monitoring should be forthcoming in the future. Noble will coordinate with NYSDEC, as appropriate, if modifications are needed to reflect final NYSDEC guidelines in future revisions of this work plan.

© Ecology & Environment, Inc. GIS Department Project #
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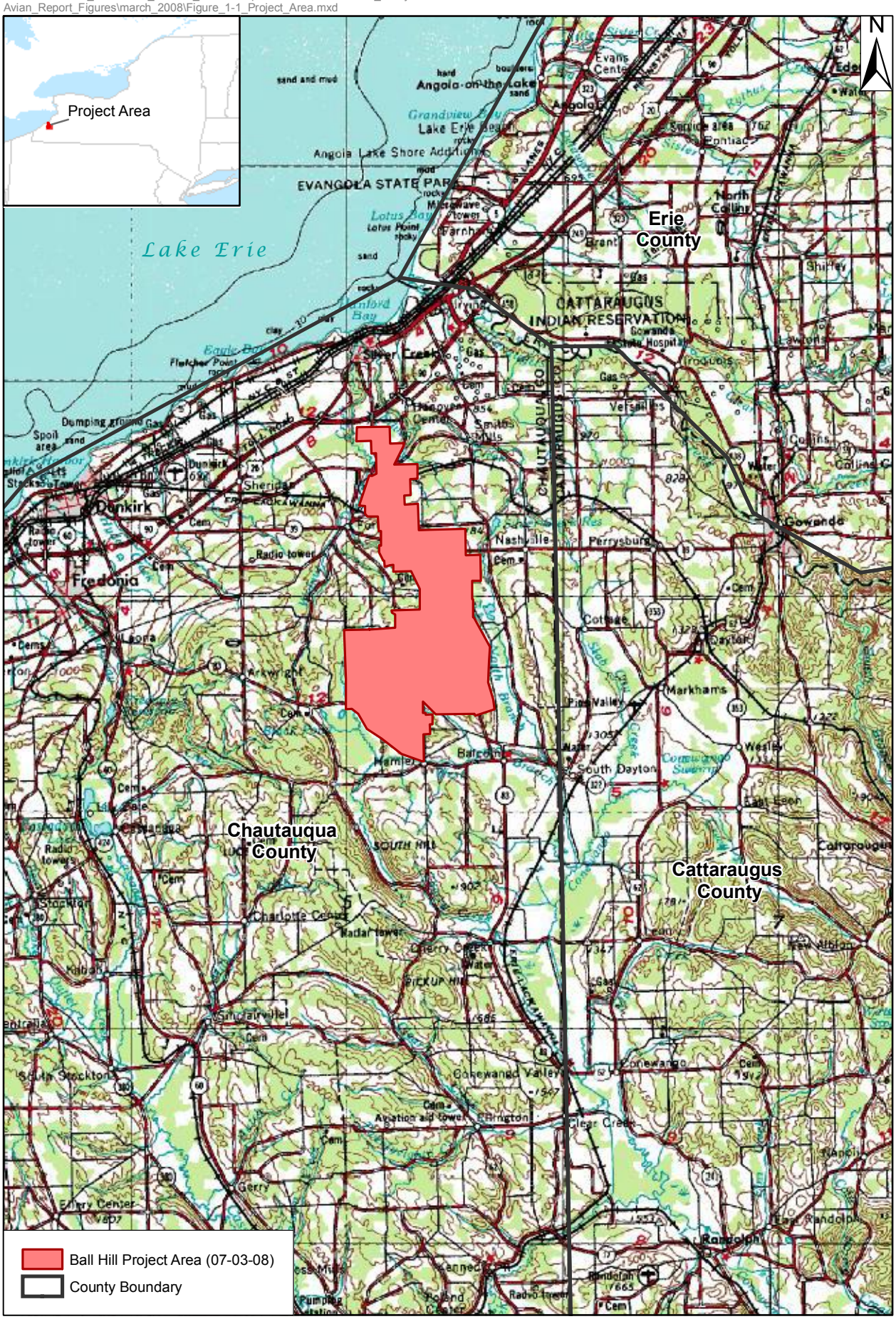
Avian_Report_Figures\march_2008\Figure_1-1_Project_Area.mxd




*Source: USGS 1:250,000 Topographic Map Quadrangles: Buffalo, 1967.*

**Figure 1-1 General Project Location**
**Noble Ball Hill Windpark**
**Towns of Villenova and Hanover,**
**Chautauqua County, New York**

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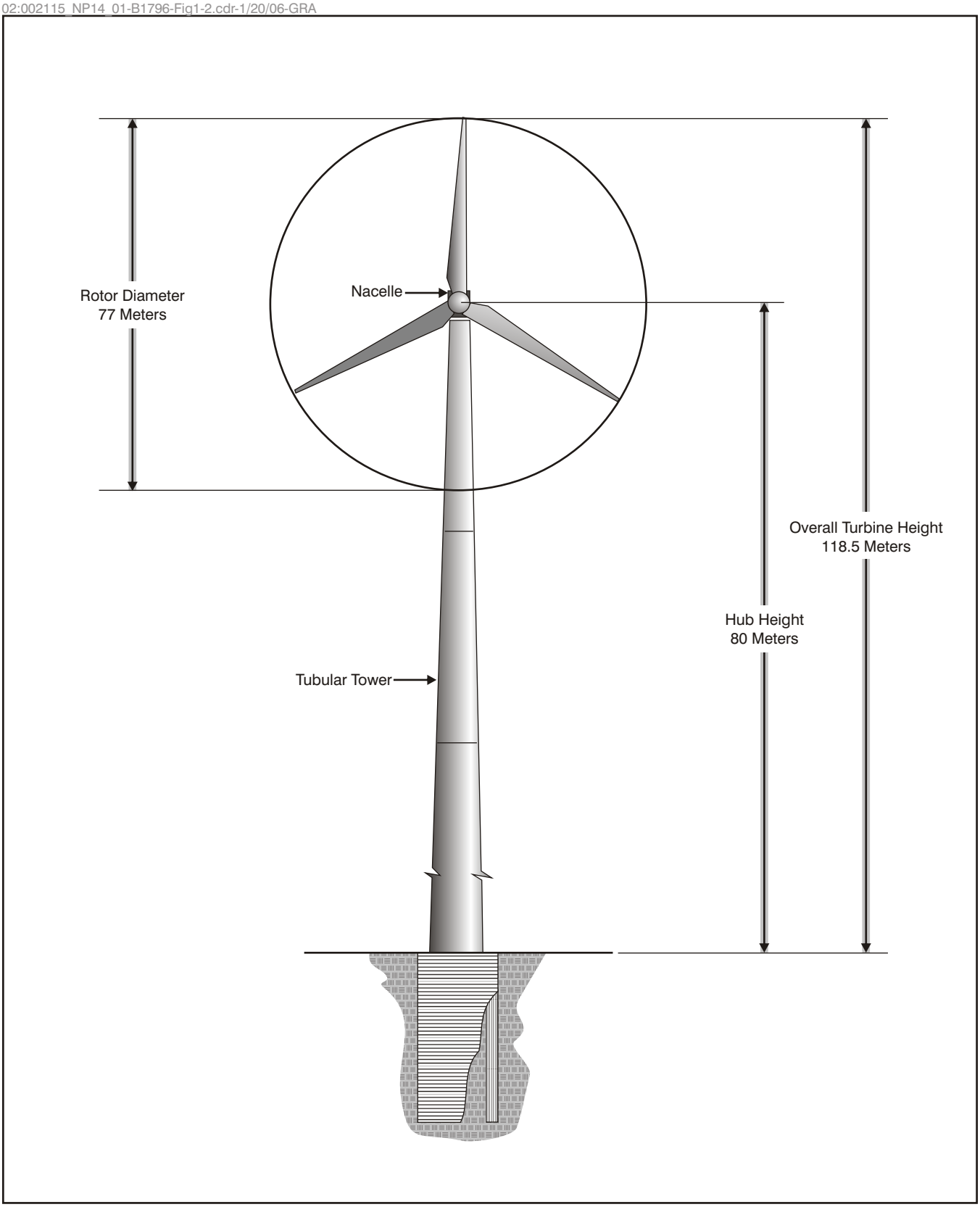


**Figure 1-2 Generalized Wind Turbine Layout**

# 2 Study Objectives

Given the concern for bird and bat resources associated with wind energy facilities, quantifying the direct collisions with turbines is the key component of the studies. The studies are a complement to pre-construction field surveys that were conducted in the fall of 2006, spring and fall of 2007, and spring of 2008 and are designed to quantify the bird and bat collision impacts from the Noble Ball Hill Windpark.

The proposed plan of study has the following objectives:

1. Collect quantitative collision data on birds and bats from the Ball Hill Windpark during migratory seasons and the summer. Estimates of numbers of fatalities will be determined for both birds and bats, both collectively, and on a species-by-species basis.

2. Collect information on the occurrence and distribution of bird species in the Project Area during the breeding season.

3. Collect information on the occurrence of bat species in the Project Area.

4. Evaluate the data and identify potential adaptive management strategies if the collision impacts are significantly adverse.

5. Evaluate the study methodology after each year and revise if necessary.

# 3 Methodology

The methodologies proposed by Noble follow procedures that have been included in previous work plans for Noble windparks in New York State (e.g. Clinton, Ellenburg, Altona, Bliss, Chateaugay, Wethersfield, and Allegany). Those work plans were developed through ongoing discussions with NYSDEC bird and bat biologists and permits staff, including meetings on October 25, 2006; March 21, 2007; and April 4, 2008. The methodologies proposed closely match those included in the NYSDEC Draft Guidelines. Noble anticipates that NYSDEC will issue finalized guidance for post-construction monitoring requirements to standardize sampling between the various projects that are under construction or being proposed within the state. While the Draft Guidelines have been published, it is the understanding of Noble that final guidance may be made available in 2008 or 2009, and as such, will be able to modify approaches, as appropriate, prior to Ball Hill Windpark becoming operational and the first year of the study. Any modifications to the work plan that are based on future NYSDEC guidance will be made in writing and will need agreement by both NYSDEC and Noble.

## Task 1: Post-Construction Bird and Bat Mortality Study

This post-construction study will estimate the magnitude of bird and bat collisions associated with the Ball Hill Windpark based on field surveys and statistical extrapolation. The study will be conducted over three years and focus on the migration periods for birds and bats in addition to the summer months. The results of this study will be useful to determine the collision impacts to migratory birds and bats and identify if the results are comparable with the range of estimated mortality rates included in the DEIS for this project.

**Study Area.** When constructed, the Ball Hill Windpark will consist of 60 1.5-MW turbines within an approximate 13,658-acre area in the Towns of Villenova and Hanover, Chautauqua County (see Figure 1-1). The turbines will be distributed in loose clusters throughout the Project Area. Within the Project Area, elevations range from 787 feet to 1,740 feet above mean sea level (amsl). With a total turbine height, from ground surface to full rotor blade extension, of approximately 389 feet, the elevations will range between 1,176 to 2,129 feet amsl). The Windpark will be lighted in accordance with Federal Aviation Administration guidelines. No guy wires will be associated with the turbines and there are also no locations suitable for perching or nesting by birds on the turbines. Access roads will connect to each turbine, allowing for vehicular access to conduct this study.

**Turbine Search Area.** There is not a current standard for turbine search area. Many current studies include searching plots based on half the maximum distance from the tip height to the ground from the turbine tower. The National Research Council indicated the minimum plot radius should be approximately equal to the diameter of the rotor (National Research Council 2007). The Draft Guidelines indicated that a search area should be no less than 1.5 times the rotor diameter. Studies conducted at wind energy facilities in Oregon, Minnesota, Wyoming, and Washington prior to 2003 found that most fatalities (more than 80%) were found within half of the maximum distance from the tip height to the ground from the turbine tower (National Research Council 2007). More recent studies conducted at the Mountaineer (West Virginia) and Meyersdale (Pennsylvania) wind-energy facilities with more rigorous methods had different results. Fewer than 3% of fatalities were found more than 50 meters from the nearest turbine at those sites, with 93% of all fatalities at Mountaineer and 84% of all fatalities at Meyersdale found less than 40 meters from the nearest turbine (Arnett et al. 2005; National Research Council 2007). In a 2003 study at Mountaineer with a search out to 60 meters from each turbine tower, the majority of carcasses were between 16 and 30 meters of the base of the turbine tower (Kerns and Kerlinger 2004; National Research Council 2007).

For at least the first year of the study, direct visual observations will be conducted within a 120-meter (394-foot) by 120-meter (394-foot) plot centered on the turbine tower. This turbine search area is approximately half the maximum distance from the tip height (118.5 meters [389 feet]) to the ground from the turbine tower and also at least 1.5 times the rotor diameter (115.5 meters [379 feet]) as per the Draft Guidelines. After the first year of the study, the turbine search area will be re-evaluated and 80-meter (263 foot) by 80-meter (263 foot) and 100-meter (328 foot) by 100-meter (328 foot) plots may be considered. Any proposed modifications to the turbine search area, will be based on specific data collected during the first year of the study, with NYSDEC and United States Fish and Wildlife Service (USFWS) approval sought in advance of implementation.

The search area will be further separated into survey transect lines at 5-meter (16.4-foot) intervals, with 24 transects sited for each turbine surveyed (see Figure 3-1). A visual scan out to approximately 2.5 meters (8.2 feet) on either side of the transect will be covered by the searcher. This method will allow tight coverage of the turbines searched to reduce the impact of unsearched ground on the estimated mortality under a turbine. Data reporting for each transect will include the perpendicular distance of each target found from the centerline to facilitate assessment of searcher efficiency and define the functional range of observation off transect centerline.

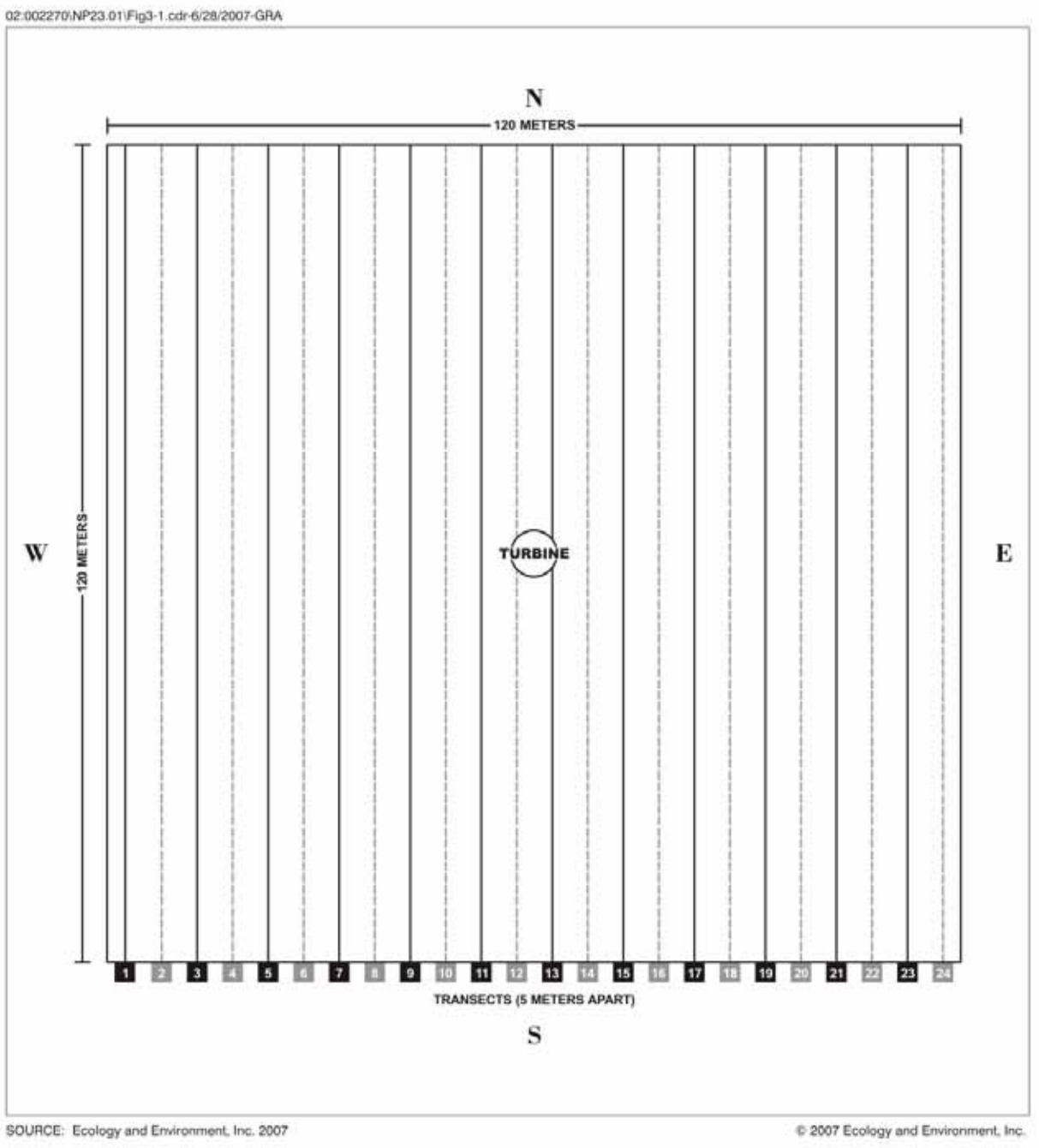


**Figure 3-1 Turbine Search Area for Daily Surveys**

Some other methodology procedures related to turbine search area include:

- Each transect will be located using a global positioning system (GPS) and/or in field flagging to assure consistency between searchers and turbine sites. Wood field stakes, rather than metal field flagging, will be used in areas where livestock may graze or where the area is utilized for crop production. Each transect line will be flagged at the beginning, mid-point, and end of each line to help assure that the searcher will remain on course.

- Prior to initiating the annual survey effort, each turbine site that is selected to be included within the scope of the survey will be searched to locate residual carcasses that may have accumulated since the Project began operating.

- Field modification of transect lines may be necessary to avoid unwalkable areas (e.g. dense forest, pit, steep slope). If necessary, correction calculations will be performed to account for the unsearchable ground.

- Prior to the commencement of sampling, the search areas beneath turbines (except forested areas) will be cleared of vegetation as necessary to facilitate the searchers' efforts. Noble will develop a regular mowing schedule after conferring with the participating landowners. Mowing/clearing of land beneath turbines involved in ground surveys will occur on a frequent, regular basis to maintain a short vegetation height suitable for ground searches.

- Heavily forested areas will only be cleared and searched out to the tree line.

**Total Turbines Surveyed.** Searches will be conducted at approximately 30% of the total turbines as per the Draft Guidelines. Therefore, 18 turbines will be searched for this study at the Ball Hill Windpark. It is anticipated that the same 18 turbines will be searched throughout the first year of the study, although it is possible that changes might be necessary during the year due to unforeseen issues with a site, access, or property owners. It is also anticipated that the same 18 turbines, or at least a majority of them, will be searched in the second and third years of study; however, the value of doing so will be evaluated following the first year of study.

Although the turbines to be searched will be selected randomly, the selection process will involve stratification by habitat prior to random selection. All turbines will be classified by one or more habitats present: agricultural (crop), grassland (hayfield or pasture), reverting field (brush), or forest, so that an appropriate mix of survey points can be selected and differences in fatality, scavenging, and searcher efficiency rates among habitats could be evaluated following data collection. Proximity to wetland complexes, forested areas, and outlying turbines will also be considered during turbine search selection and data analysis. For the Ball Hill Windpark, it is anticipated that the majority of turbines will be classified as agricultural fields or pasture, followed by forest, and reverting field (brush), in

descending order. Permission of the land owner for surveys and vegetation maintenance will also be necessary for all turbines selected for searches. Noble will use its best efforts to obtain these agreements.

**Search Interval.** Based on discussions with NYSDEC, as well as on information generally available for other wind projects, Noble proposes to further divide the 18 turbines into two subsets. Daily searches will be conducted at nine turbines and the remaining nine turbines would be searched weekly. Adjustments may be necessary due to severe weather, as searches will not be conducted during times of heavy rain, lightning, heavy snow, or other conditions considered unsafe. If possible, the weekly surveys will be made up within 1 to 3 days.

**Seasonal Duration.** Although largely dependent on weather, search efforts will extend from April 15 though November 15, as per the Draft Guidelines. Winter bird use of the Project Area is comparatively low and risk is considered minimal during this season. Although bird migration begins in March, and can extend into late November, the proposed time frame encompasses the peak of spring and fall passerine migration and the entire breeding season. Based on preliminary data being collected at other constructed wind projects, much of the mortality that is being noted is bat mortality, and is occurring as specific events in the late summer. Therefore, while bird fatalities are anticipated primarily with spring and fall migration, bat fatalities, specifically tree roosting species, are anticipated in the late summer and early fall. The search interval of April 15 through November 15 will be re-evaluated after the first year of the study. If the Project Area experiences heavy snowfall in late October or early November, it is conceivable that the surveys will be cancelled for the rest of the season.

**Field Search Methodology.** Each field surveyor will be trained in the search protocol in advance of his or her first fatality search. Daily searches will commence near sunrise and proceed until all searches for the day are completed. Searches will be temporarily delayed if severe weather or unsafe conditions exist. The transect lines within each search area will be slowly walked by one individual or a two person team. A search time of approximately 45 minutes per turbine is anticipated, although the time will vary based on habitat and terrain. The field team leader will collect the data for all carcasses found by the searchers, as available.

All carcass observations, which may include feathers or portions thereof, will be mapped on a data sheet as to its location relative to specific transect lines. Additional information to be collected for each carcass observation will include:

- Date, time, and turbine number;
- Observer;
- GPS coordinates;

- Distance and cardinal direction from the turbine;
- Distance and direction from the transect from which it was spotted;
- Condition of the carcass (e.g., whole or partial; extent of injury; and some measure of decomposition to estimate time of death);
- Position of the carcass (e.g., face-up/down, sprawled, balled up, etc.);
- Identification of bird or bat species (if possible) including age and sex, if determinable;
- Substrate conditions when found (e.g., gravel, short/long grass, crops, brush, etc.); and
- Photographic documentation of the carcass and its location;
  - In the position in which it was found,
  - Dorsal side of carcass,
  - Ventral side of carcass, and
  - Others as necessary to indicate gender and reproductive condition (bats) and any identifying plumage, bill shape, or other characteristics (birds). At least one photo of each carcass will include a ruler or other standard items used for scale.

**Identification of Carcasses.** Each carcass will be mapped on a data sheet in reference to its distance and bearing from the specific turbine. Photographic documentation will be collected of each observation. The field surveyor will attempt to identify each carcass to species. The photographic documentation will be reviewed to confirm the proper identification. All photos will be sent to NYSDEC for identification confirmation.

Any bird carcasses observed during the survey effort will be left in place (except to collect photographs) for use in the scavenging loss analysis. In order to avoid recounting, bird carcasses left in place will be marked on the leg using dark thread to indicate that they are part of the scavenging loss analysis. There will be minimal handling of bird carcasses and gloves will be worn by the field searchers. In the case of bat carcasses, final (confirmatory) identification will be by an expert (e.g. Al Hicks, NYSDEC). Based on discussions with NYSDEC, some, but not all, bat carcasses are to be collected and forwarded to NYSDEC for identification and storage. Noble will continue to coordinate with NYSDEC regarding possible on-site storage of certain bat carcasses and use for scavenging and efficiency trials. In addition to the bat carcasses provided to NYSDEC, some specific carcasses will be submitted for laboratory testing (see paragraph below).

NYSDEC has requested that specific bat carcasses be submitted for stable radioisotope analysis to determine genetic diversity within local bat populations and possibly the origin of individual bats. This study will be used by NYSDEC as a

means of assessing cumulative impacts to bat species from wind energy development. To support this effort, Noble will commit to submitting approximately 10 specimens of the following species per year toward this effort: Hoary bat (*Lasiurus cinereus*), Eastern red bat (*L. borealis*) and Silver-haired bat (*Lasionycteris noctivagans*), with a preference for females. Final details of this portion of the carcass analysis, specifically collection protocols and cost, will be coordinated with NYSDEC. It is anticipated that a hair sample and a wing will need to be collected from each individual to be tested and the remainder of the carcass can still be used for the scavenging loss analysis.

If any carcasses are initially identified as a state-threatened or endangered species, the NYSDEC will be contacted (USFWS will also be contacted for any federally threatened or endangered species found).

Noble will apply to obtain permits for the searchers to handle bird and bat carcasses. It is anticipated that permits will be received prior to implementing the studies.

**Weather.** Weather conditions, including the moon phase and time of moon rise and set, from the night prior to each survey day will be collected from local sources and supplemented by National Weather Service (NWS) data. During each morning's carcass search, weather observations will be documented on all data sheets and will include, at a minimum, cloud cover, temperature, and wind direction and speed at both ground level and turbine height. Night visibility will be characterized by estimating the percent of cloud cover to the nearest quarter percent and by recording the presence or absence of fog. Additionally, precipitation records will also be gathered from NWS data sources.

**Scavenging Loss Estimations.** The proportion of bird and bat carcasses removed from the search area by other wildlife (scavengers) will be estimated based on the information collected and several scavenger removal trials.

The number of days until scavenging removal occurs will be tracked for each bird carcass found in the search area. The degree of scavenging prior to carcass removal will be documented during each search. It will not be possible to track the number of days until scavenging removal for bat carcasses found in the search area as bat carcasses will be collected and will not be left undisturbed.

Several scavenging removal trials will also be conducted in differing seasons (spring, summer, fall) and weather conditions (dry, wet) in a variety of habitats and ground cover. Additional carcasses of varying sizes and colors that represent the expected species of birds and bats will be used based on bird and bat carcass availability. During these trials, carcasses will be placed or tossed at random locations within the search area. Placement of these "test carcasses" will be used primarily to determine searcher efficiency (see section below), but they will also be tracked for scavenging loss. Scavenging loss will be estimated for each habitat

type, carcass size, season, and searcher. Test carcasses will be those found from other locations, such as roadways, buildings, or turbines not included in the searches; or obtained from other sources. Bats, and various sizes of birds (small [warbler and sparrow size], medium [dove sized], and large [crow sized]) will be used for the trials, if possible. However, the number and sizes of carcasses used in the trials will depend on the available supply. It is Noble's assumption that NYSDEC will assist with supply of dead birds and bats in order to meet the requirements imposed for this study.

The estimates for scavenging loss will be factored in to the estimates for the total number of bird and bat fatalities during the study period.

**Searcher Efficiency.** To correct for detection bias, searcher efficiency will be estimated. As indicated in the Scavenging Loss Estimations section above, "test carcasses" will occasionally be placed at random locations within the search area during differing seasons and weather conditions in a variety of habitats and ground cover. Bats, and various sizes of birds (small [warbler and sparrow size], medium [dove sized], and large [crow sized]) will be used for the trials, if possible. However, the number and sizes of carcasses used in the trials will depend on the available supply. It is Noble's assumption that NYSDEC will assist with supply of dead birds and bats in order to meet the requirements imposed for this study. The test carcasses will be placed either one day before or on the day of the survey to reduce the potential for predation. Carcasses used for searcher efficiency trials will be marked on the leg using dark thread, in case the carcass is moved by scavengers, weather events, or by other means. The date, time, and location of the test carcass placement will be documented. Someone besides the searchers will place the test carcasses and the presence of test carcasses will not be known by the searchers. The percentage of test carcasses found will be determined based on review of the data collected by the searchers. Searcher efficiency will be estimated for each habitat type, carcass size, season, and searcher.

**Mortality Estimation.** The mortality estimate for the Ball Hill Windpark will be calculated separately for birds and bats. Scavenging loss estimations, searcher efficiency, and the proportion of turbines searched will be used to adjust the total number of carcasses found during the searches.

To calculate the total number of fatalities for the period of time in which searches would be conducted (April 15 to November 15), the estimator indicated in The National Research Council (2007) based on Erickson et al. (2004) would be used. For most of the species concerned, this time period would be an annual measurement of mortality. The rationale for this conclusion is that most species of birds and bats are not active or present during the period November through March, so there is no risk of fatalities for those species during this time period. The point estimates for the fatality rates would be calculated for each season by the formula (or an appropriate variation of the formula):

$$m = \left( \frac{N * C}{k * t * p} \right) \left( \frac{e^{I/t} - 1 + p}{e^{I/t} - 1} \right)$$

where:
*N* is equal to the total number of turbines,
*C* is the total number of carcasses detected for the period of study,
*k* is the number of turbines searched,
*I* is the interval between searches (in days),
*t* is the mean carcass removal time (in days),
*p* is the detection probability, and *k* is the number of turbines sampled.

This formula assumes correctness of the estimates for *t* and *p*, i.e., sampling error in those estimates is not considered. Fatality estimates for the entire period of study (April 15 through November 15) would be calculated by summing the seasonal estimates. Facility estimates will be further broken down, as appropriate to standalone estimates for birds, bats, seasons, and habitat.

**Utilization – Mortality Estimation.** The post-construction mortality estimation will be compared to the range of estimated collisions presented in the DEIS and to pre-construction radar study passage rates. The estimates will also be compared to results from similar studies at other windparks.

### Task 2: Acoustical Monitoring for Bats

Acoustical monitoring via AnaBat equipment will be conducted for the duration of the ground searches (approximately April 15 to November 15) of the first year of the study only. AnaBat monitoring equipment will be installed on one meteorological tower located in the Project Area. However, the location of the meteorological tower and thus the AnaBat detectors is uncertain as it is unknown at this time whether the temporary meteorological towers will remain in place following construction. One monitoring unit will be installed as high on the tower as possible, while the other unit will be installed midway between that unit and the ground. It is anticipated that the monitoring units will be deployed within a guy wire system and pointed in the direction of anticipated migration (facing south in spring and facing north in summer/fall) at a 45 degree angle facing the rotor swept zone, if possible. Bat echolocation data will be recorded digitally and analyzed for species or species-group identification.

It is anticipated that AnaBat II detectors will be used for this study. AnaBat detectors are frequency-division detectors, dividing the frequency of ultrasonic calls made by bats so that they are audible to humans. Frequency division detectors will be used based upon their widespread use for this type of survey, their ability to be deployed for long periods of time, and their ability to detect a broad range of frequency, which allows detection of all species of bats that could occur in New York. Data from the AnaBat detectors will be logged onto compact flash media and downloaded to a computer for analysis. Detectors will be programmed to re-

cord data from 7:00 p.m. to 7:00 a.m. every night. Typical for remote sensing equipment, periods of downtime are often encountered due to weather damage and equipment failure. Periods of downtime will be minimized to the extent practicable.

Call files will be extracted from data files using appropriate software, with default settings in place. Call files will be visually screened to remove files caused by wind, insect noise, and other static so that only bat calls remain. Nightly tallies of detected calls will be compiled for each detector and each night. Detection rates indicate only the number of calls detected and do not necessarily reflect the number of individual bats in an area.

Call files will be examined visually and assigned to species categories, based on comparison to libraries of known bat reference calls. This is possible only when clear calls are recorded and only with certain species. The tree-roosting bats are typically easy to identify to species while those of the genus *Myotis* are not. Call rates by species, as well as total detections and trends in species' presence in the data set will be reported. Comparisons between call rates and species composition will also be compared between the detectors.

The results of the acoustical monitoring study will be compared to the mortality study results and weather data to identify if any temporal similarities occurred between abundance and mortality.

### Task 3: Breeding Bird Surveys

Breeding bird surveys will be conducted in the Project Area during the primary breeding season (June) in the first, third, and fifth year of Project operation. One survey per each of the first, third, and fifth years will be performed using USGS Breeding Bird Survey techniques with an observer recording all birds identified by sight or sound in 5-minute periods at each survey point (USGS 2006). Survey points will be selected near turbine locations, based on accessibility and a variety of habitats and with a preference for pre-construction survey point locations and post-construction mortality study locations. Surveys will be conducted at approximately 30% (18) or more of the total turbines. The number of points surveyed per day will be limited to a reasonable number that can be conducted between sunrise and 11 a.m. It is anticipated that it will take two mornings to conduct surveys at a minimum of 18 turbines. This methodology is the same as during the 2008 pre-construction breeding bird surveys.

### Task 4: Post-construction Study Reporting and Adaptive Management Review

Interim progress reports will be provided to NYSDEC on a monthly basis throughout the study period. These reports will include the number of carcasses found under each turbine, the date of each recovery, and photographs of the carcasses found in the time period since the previous report.

A report will be prepared evaluating the results from the post-construction bird and bat mortality study, acoustical monitoring study, and breeding bird survey based on the first year of data. Potential adaptive management measures will be identified if significant adverse impacts occur. The mortality study methodology will also be evaluated in this report and, if necessary, changes identified for implementing the second year of the mortality study. A similar report will be prepared after the second year of the study and a final report evaluating all of the data collected during the study will be prepared after the third year of the study.

Noble will continue to coordinate with NYSDEC regarding the adequacy of survey methodologies following review of annual reports. The need for adaptive management strategies will be assessed based on the results of the previous year's surveys.

# 4 Schedule

The field studies will be initiated in April of the first year following construction of the Ball Hill Windpark. It is currently assumed that the field studies will start in April 2010.

| Task Number | Activity | Date |
|---|---|---|
| 1 | Bird and Bat Mortality Study | ~April 15 through ~November 15 (first three years of windpark operation; seasonal duration and/or dates subject to change after each year of study) |
| 2 | Acoustical Monitoring (Bats) | April 15 through November 15 (first year of study only) |
| 3 | Breeding Bird Survey | June (first, third, and fifth years of windpark operation) |
| 4 | Interim Progress Reports | Monthly during Bird and Bat Mortality Study field effort |
| 4 | Post-construction Study Report | By January 31 following completion of each year of mortality study in November |

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# K Visual Impact Assessment

SARATOGA ASSOCIATES

# NOBLE BALL HILL WINDPARK
# VISUAL RESOURCE ASSESSMENT

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September 19, 2008





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# 1.0 INTRODUCTION

Noble Ball Hill Windpark, LLC (Noble) is proposing to develop a wind-powered electrical-generating facility consisting of up to 60 turbines with a maximum capacity of 90 megawatts (MW). The proposed Project will be located in the Towns of Villenova and Hanover, Chautauqua County, New York. An electrical substation, switchyard and 6-mile 115 kV above ground transmission line will be located in the Town of Hanover.

To address issues of potential visual impact, Noble has retained Saratoga Associates, Landscape Architects, Architects, Engineers, and Planners, P.C. (Saratoga) to conduct a thorough and detailed Visual Resource Assessment (VRA) of the proposed Project. The purpose of this VRA is to identify potential visual and aesthetic impacts and to provide an objective assessment of the visual character of the Project, using standard accepted methodologies of visual assessment, from which agency decision-makers can render a supportable determination of visual significance.

## 1.1 METHODOLOGY

Consistent with Visual Resource Assessment (VRA) practice, this report evaluates the potential visibility of the proposed Project and objectively determines the difference between the visual characteristics of the landscape setting with and without the Project in place. The process follows basic New York State Department of Environmental Conservation Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and State Environmental Quality Review (SEQRA) criteria to minimize impacts on visual resources. This process provides a practical guide so decision makers and the public can understand the potential visual impacts and make an informed judgment about their significance (aesthetic impact).

There are no specific Federal rules, regulations, or policies governing the evaluation of visual resources. However, the methodology employed herein is based on standards and procedures used by the U.S. Department of Agriculture (National Forest Service, 1974, 1995), U.S. Department of the Interior, Bureau of Land Management (USDOI, 1980), U.S. Department of Transportation, Federal Highway Administration (USDOT, 1981), NYS Department of Transportation (NYSDOT, 1988), and the NYS Department of Environmental Conservation (NYSDEC, July 31, 2000).

This evaluation includes both quantitative (how much is seen and from what locations; or visual impact) and qualitative (how it will be perceived; aesthetic impact) aspects of visual assessment.

The visual impact assessment includes the following steps:

- Define the existing landscape character/visual setting to establish the baseline visual condition from which visual change is evaluated;
- Conduct a visibility analysis (viewshed mapping and field investigations) to define the geographic area surrounding the proposed facility from which portions of the Project might be seen;

- Identify sensitive aesthetic resources to establish priority places from which further analysis of potential visual impact is conducted;
- Select key receptors from which detailed impact analysis is conducted;
- Depict the appearance of the facility upon completion of construction;
- Evaluate the aesthetic effects of the visual change (qualitative analysis) resulting from Project construction, completion and operation; and,
- Identify opportunities for effective mitigation.

Consistent with the DEC Visual Policy, the visual study area for this VRA generally extends to a five-mile radius from the outermost turbines (hereafter referred to as the "five-mile study area" or "study area"). Beyond this distance it is assumed that natural conditions of atmospheric and linear perspective will significantly mitigate most visual impacts. However, considering the scale of the proposed Project and recognizing the proposed wind turbines will, at times, be visible at distances greater than five miles, site-specific consideration is given to resources of high cultural or scenic importance that are located beyond the typical five-mile radius.

The five-mile radius study area encompasses the entirety of the Town of Villenova and the Villages of Forestville and South Dayton, as well as portions of the Towns of Hanover, Perrysburg, Dayton, Sheridan, Charlotte, Cherry Creek and Leon, and the Village of Perrysburg.

## 1.2 Project Description

The Project area is located in Western New York, approximately 60 miles northeast of Erie, PA, 50 miles southwest of Buffalo, and 25 miles north of Jamestown. The Project includes 60 energy-generating turbines located in the Towns of Villenova (11 turbines) and Hanover (49 turbines). Generally, the turbines are bounded by NYS Route 39 to the north, NYS Route 83 to the south, CR 85 to the west, and CR 93 to the east. Turbines will be located on private land under lease agreement with property owners.

Each turbine will include a tall steel tower; a rotor consisting of three composite blades; and a nacelle, which houses the generator, gearbox, and power train. A transformer may be located in the rear of each nacelle, or adjacent to the base of the tower, to raise the voltage of the electricity produced by the turbine generator to the voltage level of the collection system (34.5 kV). The color of the blades, nacelle, and tower will be off-white. The towers will be a tapered tubular steel monopole tower.

The turbines themselves will each have a rated power of 1.5 MW. The turbine towers will be approximately 263 feet tall from ground to nacelle (hub). The tower will be approximately 16 feet wide at the base and eight (8) feet wide at the top. Each of the three turbine blades will be approximately 126 feet in length with the apex of blade rotation reaching approximately 389 feet above ground elevation. The nominal operating rotational speed of the blades will be approximately 17-22 revolutions per minute (rpm), or approximately one (1) revolution every three (3) seconds.

In addition to the wind turbines, the Project will involve the construction of gravel access roads, interconnection cables, meteorological towers, an operation and maintenance facility, and an electrical substation and switchyard. All of these elements will be located in the Towns of Hanover and Villenova. While the majority of the interconnection cables (between the turbines) will be buried, a small segment(s) may be routed above ground where engineering and environmental issues may arise.

The operation and maintenance facility will also include an area suitable for an equipment yard and parking lot. While the location of this facility is yet to be finalized, it is anticipated that it will be located near the middle of the Project area in order to reduce travel time for maintenance crews to reach any turbine. A 6-mile overhead 115 kV transmission line will be constructed to connect the turbines with an existing National Grid 230 kV transmission line in the Town of Hanover.

## 1.3 Aviation Obstruction Marking and Lighting

According to the Federal Aviation Administration (FAA), daytime lighting of wind turbines is generally not necessary. Due to their solid (i.e. non-skeletal) construction, as well as their moving characteristics, turbine structures provide sufficient warning to pilots during all daytime conditions and all documented terrain and sky conditions. The FAA recommends that turbines be painted either bright white, or a slight shade from white, to provide the maximum daytime conspicuity.

The FAA requires lighting of perimeter turbines, as well as interior turbines with a maximum gap between lit turbines of no more than ½ mile (2,640 feet). Based on these guidelines and the evaluated 60-turbine layout, approximately 34 of the proposed turbines may be illuminated at night for aviation safety.[1] One aviation obstruction light will be affixed to the rear portion of the nacelle on each turbine to be illuminated.

Lighting may be L-864 red flashing lights, in the form of incandescent or rapid discharge. The FAA recommends red light emitting diode or rapid discharge style L-864 fixtures to minimize impacts on neighboring communities, as the fixtures' exposure time is minimal, thus creating less of a nuisance. All light fixtures within the Project must flash in unison, thus delineating the Project as one large obstruction to pilots.[2] L-864 red flashing aviation obstruction lights are designed to emit light in an upward direction with maximum visibility for pilots.

The L-864 unit is a low intensity light emitting 2,000 candelas.[3] For general comparison purposes, a 50-watt incandescent light bulb used for indoor track lighting may emit 510 candelas[4] and vehicular daytime running lamps produce up to 7,000 candela.[5]

[1] The FEIS will contain a formal lighting plan. The number of lit turbines is subject to change based on this plan.
[2] U.S. Department of Transportation, Federal Aviation Administration, "*Development of Obstruction Lighting Standards for Wind Turbine Farms*" (DOT/FAA/AR-TN05/50, November 2005)
[3] Candela is the unit of luminous intensity, equal to one lumen per steradian (lm/sr).
[4] http://www.gelighting.com - candelas vary base on lightbulb style, wattage, etc.
[5] http://www.nhtsa.dot.gov

# 2.0 LANDSCAPE CHARACTER/VISUAL SETTING

Landscape character is defined by the basic pattern of landform, vegetation, water features, land use, and human development. This descriptive section offers an overview of the intrinsic visual condition of the study region and establishes the baseline condition from which to evaluate visual change.

The Project area is surrounded by rolling hills of agriculture and forested land. With the exception of two (2) community centers (Village of Forestville and Village of South Dayton), the study area is relatively rural and largely undeveloped. Broad tracts of agricultural land are either actively maintained or brush covered due to inactivity (fallow fields). Mature deciduous woodlands are found throughout the study area, with a significant amount found on State land (i.e. Boutwell Hill State Forest and the Canadaway Creek Wildlife Management Area), covering hillsides and hilltops, and weaving through farmed areas and alongside creeks and rivers. Other local land cover includes hedgerows, yards, streams, small ponds, and low-density housing. With the exception of the more developed areas, such as the Villages of Forestville and South Dayton, built features typically include low-density single-family residential structures and farmsteads. The hills and hillocks are the dominant landscape element and form the visible horizon from the majority of the Project area outside the downtown section of each of the four community centers.

## 2.1 TOPOGRAPHY

The proposed Project occupies a small portion of the northern edge of the Cattaraugus Highlands, which is a sub-region of the Allegheny Plateau, and the Erie-Ontario Plain, which is a sub-region of the Great Lakes Plain. The topography within the Project area rises quickly from the gently sloping land bordering Lake Erie, to a series of undulating ridge tops with deeply cut generally north-south aligned ravines and valleys. Elevation throughout the study area averages 1,000 to 1,500 feet above sea level. In the uplands, defined by relatively broad, undulating plateaus, such as those around Boutwell Hill State Forest and Canadaway Creek Wildlife Management Area, elevations generally range between 1,725 feet to 2,150 feet above sea level. Terrain throughout the study area consists largely of undulating hills, ridges and areas of smaller rounded hillocks, often bisected by ravines.

## 2.2 VEGETATION

Dominant tree species within the study area are representative of the northern hardwood zone found throughout much of the Western New York Region. Species include beech, maple, ash, elm, and hemlock. In addition to these deciduous climax species, isolated plantings of red and white pine are scattered throughout the study area. Coinciding with the mix of open field and woodlots is a significant amount of secondary growth edge habitat. For the most part, this secondary growth takes the form of hedgerows, wood borders, and old fields. Beyond the Project area, the landscape remains primarily rural agriculture, with the exceptions of the Villages of South Dayton and Forestville, which each feature greater housing and business density, as well as tree-lined streets.

Some of the highest vegetation density within the study area is found in the southwestern portion of the five-mile study radius within the Boutwell Hill Management Unit, which is comprised of Canadaway Creek Wildlife Management Area to the north and Boutwell Hill State Forest to the south.

The dominant tree species in the Unit is northern hardwood, with some Allegheny hardwoods as well. Ninety-four percent of the Boutwell Hill Management Unit is classified as commercial forest.

## 2.3 Water Features

Water features are not a major component of the visual landscape in the vicinity of the proposed wind farm. The most prominent water resources within the study area include Big Indian Creek, Blaisdell Creek, Canadaway Creek, North and West Branch of the Conewango Creek, Silver Creek, Slab City Creek, Walnut Creek and Tupper Creek. Additional notable resources within the study area, include, but are not limited to, Black Pond, East and West Mud Lake, and the Silver Creek Reservoir. Numerous private farm ponds, scattered wetlands, and small streams are also found in the study area.

Is should also be noted, that the largest water feature in the area, Lake Erie, is approximately 7.1 miles from the nearest turbine.

## 2.4 Transportation

NYS Routes 39, 83, and 322, are the primary transportation thoroughfares in the study area. These roads generally run west to east. NYS Route 39 enters the study area from the Town of Sheridan and exits the study area through the Village of Perrysburg. This road is located just north of the Project area with turbines proposed to be located within 0.3 mile of the road. NYS Route 83 enters the study area in the Town of Arkwright and exits through the Town of Cherry Creek. NYS Route 322 begins in the Hamlet of Balcom in the Town of Cherry Creek, continuing eastward where NYS Route 322 breaks off to the south. In addition to these, the NYS Thruway (I-90) runs through the northernmost part of the study area in the Town of Hanover for a length of approximately two miles.

A number of county routes are also located within the study area. Among these, County Routes 85, 93, 89, 87, 72, 88 and 77 are within Chautauqua County, and County Routes 2 and 78 are within Cattaraugus County. The County Routes within the study area connect numerous hamlets and Villages, and serve as the primary transportation routes outside the NYS Routes within the study area.

## 2.5 Population Centers

Community Centers – Within the study area are two (2) villages. These larger community centers include the Villages of Forestville and South Dayton and are located entirely within the study area.

Village of Forestville - The Village of Forestville is located in the Town of Hanover, approximately 2.6 miles northeast of the nearest turbine. Road configuration in this small Village generally exhibits less of an organized structure. The Village includes several main residential roads that connect back to Main Street in a variety of configurations. Commercial establishments (service facilities and offices) are generally clustered along NYS Route 39 (Main Street). The Forestville Elementary, Middle and High Schools are located south of Academy Street. Low to moderate density single-family housing is found within portions of the Village. Residential dwellings tend to be older and well maintained with mature vegetation lining many roadways. Development density drops sharply outside the Village center.

Activities within the Village of Forestville are generally related to small business, local shopping, and residential uses.

Village of South Dayton - The Village of South Dayton is located in the Town of Dayton, approximately 2.8 miles southeast of the nearest turbine. Roads in this Village exhibit a moderate grid-like pattern. The Village includes several residential roads that mostly connect back to Main Street or NYS Route 322 (Pine Street). A focal point of the village is a "village green," (includes a gazebo, park benches, and informal picnicking area) which is bound by NYS 322 (Pine Street), Maple Street, Railroad Street and Park Avenue. Commercial establishments (service facilities and offices) are generally clustered along NYS Route 322 (Pine Street) and adjacent to the "village green". Industrial uses are also evident within the southeastern portion of the Village, generally situated around the railroad tracks. Low to moderate density single-family housing is found throughout the Village. Residential dwellings tend to be older and well maintained with mature vegetation and sidewalks lining many roadways. Development density drops sharply outside the Village center.

Activities within the Village of South Dayton are generally related to small business, local shopping, recreation, and residential uses.

Rural Residential Areas - Outside of those communities identified above, homes and agricultural support buildings are either clustered at crossroad hamlets (varying in size), such as Hamlet, Black Corners, and Balcom Corners, or are very sparsely located on individual properties. Residences (a mix of old and new) and accessory structures (barns, garages, etc.) are often found in roadside locations, however many are located on isolated lots out of view from local roads. Rural homes range in quality from well maintained single-family frame construction to older housing stock in need of repair. Mobile homes, of varying vintage, are also a common housing type. These are generally located on isolated lots and within mobile home parks.

# 3.0 VISUAL IMPACT ASSESSMENT

## 3.1 VIEWSHED MAPPING (ZONE OF VISUAL INFLUENCE)

### 3.1.1 Viewshed Methodology

The first step in identifying potentially affected visual resources is to determine whether or not the proposed Project would likely be visible from a given location. Viewshed maps are prepared for this purpose. Also known as defining the zone of visual influence, viewshed mapping identifies the geographic area within which there is a relatively high probability that some portion of the proposed Project would be visible.

The overall accuracy of viewshed mapping is dependent on the number and location of control points (study points representing proposed turbines) used in the viewshed calculation. To calculate the maximum range of potential turbine visibility, one control point was established at the turbine high point (i.e., apex of blade rotation) for each of the 60 turbines being evaluated. The resulting composite viewshed identifies the geographic area within the five-mile study area where some portion of the proposed wind energy Project (the apex of one or more turbine blades) is theoretically visible.

One viewshed map was prepared defining the area within which there would be no visibility of the Project because of the screening effect caused by intervening topography (See Figure 1). This treeless condition analysis is used to identify the maximum potential geographic area within which further investigation is appropriate. A second map was prepared illustrating the probable screening effect of existing mature vegetation. This vegetated condition viewshed, although not considered absolutely definitive, acceptably identifies the geographic area within which one would expect to be substantially screened by intervening forest vegetation (See Figure 2).

Identified viewshed areas are further quantified to illustrate the number of turbines that may be visible from any given area. This cumulative degree of visibility is summarized on each map using the following groupings:

- 1-5 turbines visible;
- 6- 10 turbines visible;
- 11-15 turbines visible;
- 16-20 turbines visible;
- 21-35 turbines visible;
- 36-50 turbines visible; and
- 51-60 turbines visible.

By themselves, the viewshed maps do not determine how much of each structure is visible above intervening landform or vegetation (e.g., 100%, 50%, 10% etc. of total turbine height), but rather the area within which there is a relatively high probability (theoretical visibility) that the top of one or more turbines would be visible. Their primary purpose is to assist in determining the potential visibility of the proposed Project from the identified visual resources.

In this evaluation, ArcGIS 9.2 and ArcGIS Spatial Analyst software were used to generate viewshed areas based on publicly available digital topographic and land cover datasets. Viewshed maps were created by first importing a digital elevation model (DEM) of the Study Area. This DEM, obtained through the United States Geological Survey from its National Elevation Dataset, represents the best publicly available digital elevation data and is sampled at a 10-meter grid cell resolution. In order to run viewshed analyses, this dataset was projected to the Universal Transverse Mercator (UTM) coordinate system with a nominal resolution of 10 meters. The computer then scanned from each control point to all cells within this DEM, distinguishing between grid cells that would be hidden from view and those that would be visible based solely on topography. A conservative offset of 2 meters was applied to each DEM cell to simulate the height of a human observer. All grid cells within the study area were coded based on the number of proposed turbines that would be visible to a theoretical observer whose eye height is two meters above ground level.

Vegetation data was extracted from the National Land Cover Data Set 2001. The NLCD dataset, produced by the Multi-Resolution Land Characteristics Consortium, was developed from a multi-spectral classification of LANDSAT 7 Thematic Mapper (TM) imagery (2001 is the nominal year of image acquisition) sampled to a 30-meter grid cell resolution.[6] The screening effect of vegetation was incorporated by including an additional 40 feet (12.2 meters) of height for those DEM grid cells that are completely forested (according to NLCD dataset) and then repeating the viewshed calculation procedure. Forested areas were then removed from the viewshed to account for areas located within a full forest canopy (where visibility would have been based on an observer two meters above the canopy height). Based on field observation, most trees in forested portions of the study area appear to be taller than 40 feet. This height therefore represents a conservative estimate of the efficacy of vegetative screening.

It is important to note that the NLCD dataset is based on interpretation of forest areas that are clearly distinguishable using multi-spectral satellite imagery. As such, the potential screening value of site-specific vegetative cover such as small hedgerows, street trees and individual trees and other areas of non-forest tree cover may not be represented in the viewshed analysis. Furthermore, the NLCD dataset does not include the screening value of existing structures. This is a particularly important distinction in the populated areas such as the Villages of Forestville and South Dayton, and other commercial and residential areas where existing structures are likely to provide significant screening of distant views. With these conditions, the viewshed map conservatively overestimates potential Project visibility in areas where the Project may be substantially screened from view.

It is noteworthy that untrained reviewers often misinterpret treeless condition viewshed maps to represent wintertime, or leafless condition visibility (Figure 1). In fact, deciduous woodlands provide a substantial visual barrier in all seasons. Since the NLCD dataset generally identifies only larger

[6] Thirty-meter resolution is the smallest vegetative grid cell increment commonly available for the Proposed Project region. This resolution provides an appropriate degree of accuracy for development of five-mile viewshed maps given the fairly broad patterns of existing land use in the area, as well as the accuracy of mapped topographic data (i.e., 1:24,000-scale USGS topographic maps with 10-foot contour intervals)

stands of woodland vegetation that is clearly distinguishable from multispectral satellite imagery, viewshed maps that include the screening value of existing vegetation are equally representative of both leaf-on and leaf-off seasons (Figure 2). Treeless condition analysis is provided only to assist experienced visual analysts identify the maximum potential geographic area within which further investigation is appropriate. Such topography-only viewshed maps are not generally intended or appropriate for public interpretation of presentation.

Finally, the viewshed maps indicate locations in the surrounding landscape in which one or more turbine highpoints (i.e. apex of blade rotation) might be visible. These maps do not imply the magnitude of visibility (i.e. how much of each turbine is visible), the viewer's distance from each visible turbine or the aesthetic character of what may be seen. Interpretation along these lines is the subject of the next phase of analysis (see section 3.4 below).

### 3.1.2 Nighttime Visibility

A viewshed map (See Figure 3) was created to assist in evaluating potential nighttime visibility. The vegetated viewshed map was created using the same methodology as described above, however, the map was created using the approximate height (265 feet) of the FAA required lights as the control point for 34 turbines.

### 3.1.3 Verification of Viewshed Accuracy

Because the viewshed map identifies the geographic area within which one or more of the proposed turbines could theoretically be visible, but does not specify which of the 60 turbines evaluated would be within view, it is not readily feasible to field confirm viewshed accuracy. While it is common practice to field confirm viewshed maps prepared for a single study point through the use of balloon study or more intuitive means, the inability to field confirm viewshed accuracy is unique to analysis of multiple point projects covering a large geographic area, such as wind energy projects.

To help determine the accuracy of the vegetation data used for viewshed development, the NLCD data set was overlaid on color aerial images (2004) of the study area and reviewed for consistency. While minor inconsistencies were noted, including areas of recently cleared lands, areas of inactive/abandoned agricultural land showing a degree of pioneer species growth, and areas of non-forest vegetative cover (e.g. Village of South Dayton), the vast majority of woodland areas visible on the satellite image were consistent with the NLCD overlay.

### 3.1.4 Viewshed Interpretation

Table 1 indicates the degree of theoretical visibility illustrated on the viewshed maps within the five-mile radius study area.

**Table 1 Viewshed Coverage Summary**

| | Topography Only Viewshed (Figure 1 – Topographic Viewshed) | | Vegetation and Topography Viewshed (Figure 2 - Vegetated Viewshed) | |
|---|---|---|---|---|
| | **Acres** | **Percentage of Study Area** | **Acres** | **Percentage of Study Area** |
| No Structures Visible | 20,424 | 20.4% | 70,817 | 70.8% |
| 1-5 Structures Visible | 5,118 | 5.1% | 4849 | 4.8% |
| 6-10 Structures Visible | 4,002 | 4.0% | 3,532 | 3.5% |
| 11-15 Structures Visible | 4,395 | 4.4% | 2,879 | 2.9% |
| 16-20 Structures Visible | 4,129 | 4.1% | 2,283 | 2.3% |
| 21-35 Structures Visible | 13,703 | 13.7% | 6,592 | 6.6% |
| 36-50 Structures Visible | 24,463 | 24.4% | 6,918 | 6.9% |
| 51-60 Structures Visible | 23,787 | 23.9% | 2,152 | 2.2% |
| Total | 100,022 | 100.0% | 100,022 | 100.0% |

*Table 1 and Figure 1 illustrate that one or more structures - including existing as well as proposed structures - are theoretically visible from approximately 79.6 percent of the five-mile study radius. However, as discussed above, this unrealistic treeless condition analysis is used only to identify the maximum potential geographic area within which further investigation is appropriate. This viewshed is not representative of the anticipated geographic extent of visibility and is not intended for public interpretation. Acreage is rounded to the nearest whole number in Tables 1 and 2.

**Table 2 FAA Viewshed Coverage Summary**

| | Vegetation and Topography Viewshed (Figure 3 – FAA Navigation Light Vegetated Viewshed) | |
|---|---|---|
| | **Acres** | **Percent cover** |
| No Structures Visible | 75,011 | 75% |
| 1-5 Structures Visible | 8,025 | 8.0% |
| 6-10 Structures Visible | 4,998 | 5.0% |
| 11-15 Structures Visible | 4,236 | 4.2% |
| 16-20 Structures Visible | 4,053 | 4.1% |
| 21-34 Structures Visible | 3,699 | 3.7% |
| Total | 100,022 | 100.0% |

Based on the vegetation viewshed (Table 1 and Figure 2), one or more of the proposed turbines will be theoretically visible from approximately 29.2 percent of the five-mile radius study area. Approximately 70.8 percent of the study area will likely have no visibility of any wind turbines. Visibility is most common in the agricultural uplands from cleared lands with vistas in the direction of turbine groupings.

The vegetated viewshed map shows that the Project will be visible within portions of the Village of South Dayton and the Village of Forestville. Most of the visibility shown within these villages will be further screened by structures and localized vegetation. From the downtown sections of both villages, potential Project visibility appears to be minimal, when present at all. Within the Village of Forestville, potential for visibility is greatest along NYS Route 39 just west of the village center and

filtered views are possible along short segments of Ceder and Chestnut Roads. Potential visibility, within the Village of South Dayton, generally occurs south of NYS Route 322. Views of the Project were noted along sections of 1st Avenue, 2nd Avenue and Main Street. Direct and, in some cases, open views are more prevalent on the outskirts of these community centers where localized residential and commercial structures, street trees and site landscaping are less likely to provide a visual barrier. Visibility of the Project may also be available within the hamlets scattered throughout the study area.

Open views of the Project will be available from many roadways where roadside vegetation is lacking. These roadways would include, but are not limited to, the NYS Thruway, NYS Routes 39, 83, and 322, County Routes 93, Prospect Road, North and South Hill Road, Pope Hill Road, Round Top Road, Aldrich Hill Road, Hanover Road, and Flucker Hill Road. Many of these views may be long distant (background view), fleeting as viewers pass in vehicles, or short in duration. Visibility along roads that intersect the immediate project area is generally greater than visibility from roads farther away. The portion of Prospect Road that bisects the Project area from southeast to northwest has the greatest visibility of any road immediate to the Project area. Turbines will be visible on both side of Prospect Road, as well as Bartlett Hill Road, North Hill Road, Smith Road, Dye Road, Pope Hill Road, and Round Top Road.

No views, or limited views will occur on the backside of the many hills and within ravines found throughout the five-mile study area. Where topography is oriented toward the turbines, dense forest cover commonly prevents distant views.

As illustrated in Table 2 and Figure 3, the viewshed map indicates that one or more of the 34 FAA required light sources will theoretically be visible from approximately 25 percent of the five-mile radius study area. Approximately 75 percent of the study area will likely have no visibility of any proposed light sources. Views of the lit proposed turbines would be possible from sections of the Villages of Forestville and South Dayton, and Hamlets such as Hamlet, Balcom, Balcom Corners and Skunks Corner. However, visibility will be most evident in the agricultural uplands from cleared lands with down-slope vistas in the direction of the proposed Project, and participating Project properties with lit turbines. In addition, views of the lit turbines are prominent from a number of roadway segments in the study area, including the NYS Thruway, NYS Routes 39, 83, and 322, County Routes 93 and 87, North and South Hill Road, Pope Hill Road, Farrington Hollow Road, Round Top Road, and Flucker Hill Road.

# TOPOGRAPHIC VIEWSHED
## Noble Ball Hill Windpark

Figure 1
September 2008

KEY

- ① Proposed Wind Turbine
- 1 Sensitive Resource
- Earl Cardot Eastside Overland Trail
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Cattaraugus Indian Reservation
- Water Body
- State Forest
- Wildlife Management Area

Number of Turbines Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 60

PROJECT # 2007 - 07097.10M

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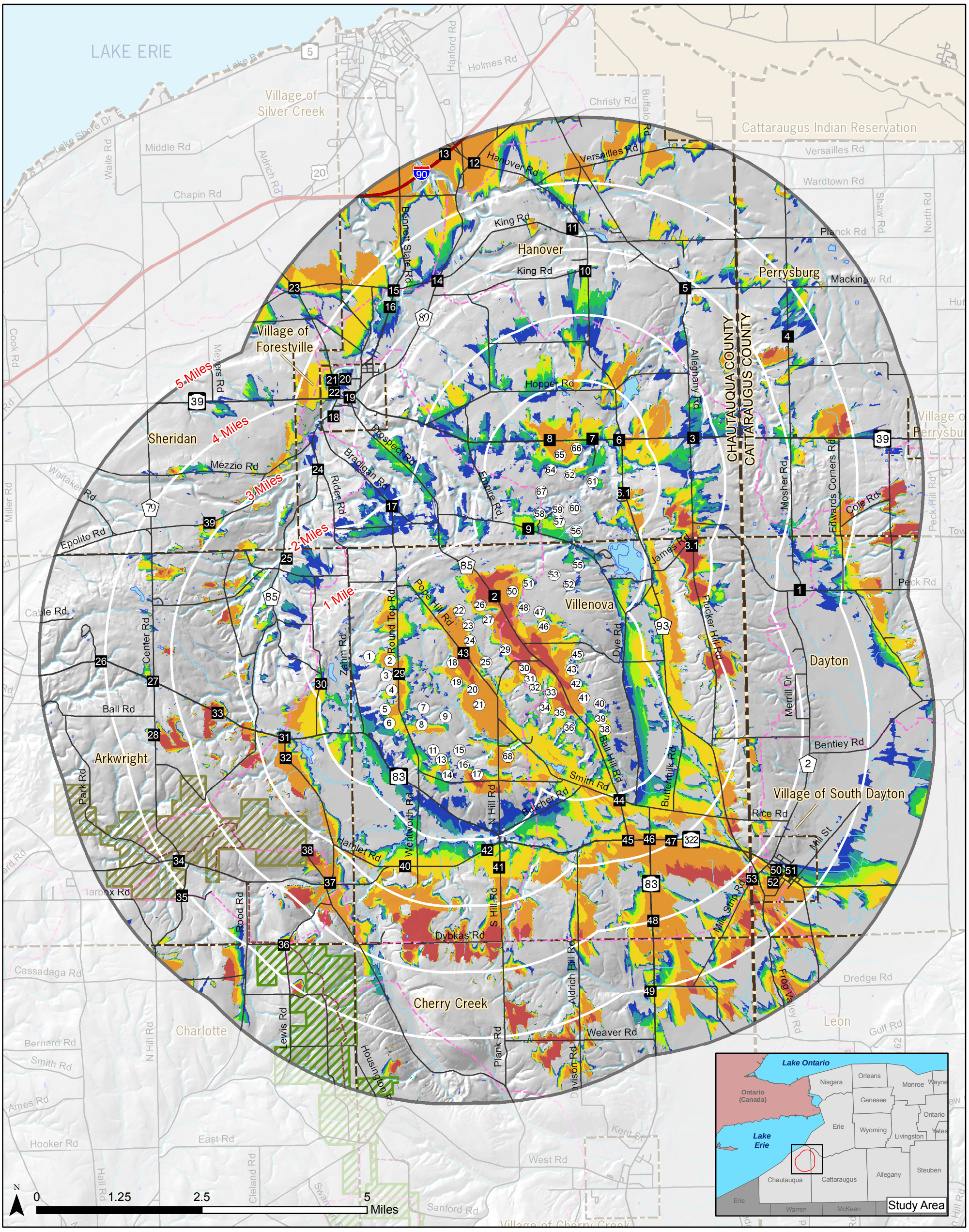


# VEGETATED VIEWSHED*

## Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure 2
September 2008

KEY

- ① Proposed Wind Turbine
- 1 Sensitive Resource
- Earl Cardot Eastside Overland Trail
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Cattaraugus Indian Reservation
- Water Body
- State Forest
- Wildlife Management Area

Number of Turbines Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 60

PROJECT # 2007 - 07097.10M

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# FAA NAVIGATION LIGHT VEGETATED VIEWSHED*

## Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure 3

September 2008

KEY

- Proposed Wind Turbine
- Proposed Wind Turbine with FAA Navigation Light
- Sensitive Resource
- Earl Cardot Eastside Overland Trail
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Cattaraugus Indian Reservation
- Water Body
- State Forest
- Wildlife Management Area

Number of Lighted Turbines Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 34

PROJECT # 2007 - 07097.10M
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## 3.2 Inventory of Visually Sensitive Resources

### 3.2.1 Inventory Criteria

Because it is not practical to evaluate every conceivable location where the proposed Project might be visible, it is accepted visual assessment practice to limit detailed evaluation of aesthetic impact to locations generally considered by society, through regulatory designation or policy, to be of cultural and/or aesthetic importance. In rural areas where few resources of statewide significance are likely to be found, it is common practice to expand inventory criteria to include places of local sensitivity or high intensity of use.

Resources of Statewide Significance - The DEC Visual Policy requires that all aesthetic resources of statewide significance be identified along with any potential adverse effects on those resources resulting from the proposed Project. Aesthetic resources of statewide significance may be derived from one or more of the following categories:

- A property on or eligible for inclusion in the National or State Register of Historic Places [16 U.S.C. § 470a et seq., Parks, Recreation, and Historic Preservation Law Section 14.07];
- State Parks [Parks, Recreation, and Historic Preservation Law Section 3.09];
- Urban Cultural Parks [Parks, Recreation, and Historic Preservation Law Section 35.15];
- The State Forest Preserve [NYS Constitution Article XIV], Adirondack and Catskill Parks;
- National Wildlife Refuges [16 U.S.C. 668dd], State Game Refuges, and State Wildlife Management Areas [ECL 11-2105];
- National Natural Landmarks [36 CFR Part 62];
- The National Park System, Recreation Areas, Seashores, and Forests [16 U.S.C. 1c];
- Rivers designated as National or State Wild, Scenic, or Recreational [16 U.S.C. Chapter 28, ECL 15-2701 et seq.];
- A site, area, lake, reservoir, or highway designated or eligible for designation as scenic [ECL Article 49 or NYDOT equivalent and Adirondack Park Agency], designated State Highway Roadside;
- Scenic Areas of Statewide Significance [of Article 42 of Executive Law];
- A State or federally designated trail, or one proposed for designation [16 U.S.C. Chapter 27 or equivalent];
- Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map];
- State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution];
- Palisades Park [Palisades Interstate Park Commission]; and
- Bond Act Properties purchased under Exceptional Scenic Beauty or Open Space category.

Resources of Local Interest - Places of local sensitivity or high intensity of use (based on local context) were also inventoried, even though they may not meet the broader statewide threshold. Aesthetic resources of local interest were generally derived from the following general categories:

- Recreation areas including playgrounds, athletic fields, boat launches, fishing access, campgrounds, picnic areas, ski centers, and other recreational facilities/attractions;
- Areas devoted to the conservation or the preservation of natural environmental features (e.g., reforestation areas/forest preserves, wildlife management areas, open space preserves);
- A bicycling, hiking, ski touring, or snowmobiling trail designated as such by a governmental agency;
- Architectural structures and sites of traditional importance as designated by a governmental agency;
- Parkways, highways, or scenic overlooks and vistas designated as such by a governmental agency;
- Important urban landscape including visual corridors, monuments, sculptures, landscape plantings, and urban green space;
- Important architectural elements and structures representing community style and neighborhood character;
- An interstate highway or other high volume (relative to local conditions) road of regional importance;
- A passenger railroad or other mass transit route; and
- A residential area greater than 50 contiguous acres and with a density of more than one dwelling unit per acre.

Other Places for Analysis - Given the rural character of much of the study area, the inventory of aesthetic resources has been further expanded to be conservatively over-inclusive. In several cases, locations not rising to the threshold of statewide significance or local interest have been included to represent visibility along sparsely populated rural roadways; most were selected based on field observation of open vistas. Although possibly of interest to local residents, such locations are not considered representative of any aesthetically significant place.

Resources of statewide significance, resources of local interest and other places for analysis were identified though a review of published maps and other paper documents, online research, and windshield survey of publicly accessible locations.

### 3.2.2 Summary Characteristics of Inventoried Resources

Overall Population and Density of Development – The study area is generally rural, with two (2) villages, in their entirety, located within the study area. The Villages of South Dayton and Forestville are the major population centers in the study area, with 662 and 770 residents in each, respectively. In addition, a small portion of the Village of Perrysburg is also within the study area (population of 408). The Village of Perrysburg and the Village of Forestville are both under one square mile in land area, and the Village of South Dayton is just over one square mile in area. The proposed Project will be located in the Town of Villenova, which is the least populous town in the study area (1,121 residents) and in the Town of Hanover, which is the most populous town in the study area (7,638 residents).

**Table 3 Demographic Summary of Study Area Municipalities (2000 Census)**

| Municipality | Year Round Population | Population Density[7] | Total Housing Units |
|---|---|---|---|
| *New York State* | *18,976,457* | *402* | |
| *Cattaraugus County* | 83,955 | *64* | *39,839* |
| Town of Perrysburg | 1,771 | 62 | 752 |
| Village of Perrysburg | 408 | 414 | 162 |
| Town of Sheridan | *2,838* | 76 | 1,079 |
| Town of Dayton | 1,945 | 52 | 836 |
| Village of South Dayton | 662 | 630 | 268 |
| Town of Leon | 1,380 | 39 | 464 |
| *Chautauqua County* | *139,750* | *132* | *64,900* |
| Town of Villenova | 1,121 | 31 | 489 |
| Town of Cherry Creek | 1,152 | 31 | 498 |
| Town of Charlotte | 2,331 | 47 | 717 |
| Town of Hanover | 7,638 | 155 | 3,501 |
| Village of Forestville | 770 | 788 | 324 |
| Town of Arkwright | 1,126 | 32 | 509 |

Highway Corridors - Due to its predominately rural agricultural landscape, many of the roadways within the study area are relatively lightly traveled with a few exceptions (e.g. NYS Thruway I-90). The primary roadways within the study area are NYS Routes 39, 83, 322, and NYS Thruway (I-90).

NYS Route 39 is a west-east route that enters the study area west of Forestville and exits the study area in the Village of Perrysburg. Roughly 2,000 to 3,000 cars per day travel this stretch of road. Turbines would be located south of NYS Route 39.

NYS Route 83 crosses the study area from west to east, entering from the Town of Arkwright and turning south upon its intersection with NYS Route 322 and exiting the study area from the Town of Cherry Creek. Turbines would be located north of NYS Route 83.

The NYS Thruway (I-90) receives more traffic than any other road within the study area. Roughly two miles of I-90 cross through the study area within the Town of Sheridan. An average of 25,336 vehicles travel on this stretch of road each day.

Table 4 summarizes the average annual daily traffic (AADT) for state highways within the study area. In addition to a number of NYS Routes and I-90, numerous county and local roads traverse the study area. Generally, these roads are lightly traveled.

[7] Population density is calculated by residents per square mile and is rounded to the nearest whole number.

**Table 4 Annual Average Daily Traffic Volumes for Study Area Highways [8]**

| Route | Section | AADT |
|---|---|---|
| NYS Route 39 | Cattaraugus County Line to CR 58 North Road | 1,935 |
| NYS Route 39 | Between US Route 20 and CR 141 (Forestville) | 2,923 |
| NYS Route 39 | Between CR 141 Forestville and Cattaraugus County Line | 2,060 |
| NYS Route 83 | Between CR 307 Chicken Tavern and NYS Route 60 Laona (end NYS Route 83) | 1,491 |
| NYS Route 83 | Between NYS Route 322 (Balcom) and CR 312 Hamlet Road | 1,754 |
| NYS Route 83 | Between CR 312 Hamlet Road and CR 307 Chicken Tavern | 1,740 |
| NYS Route 83 | Between CR 70 Southside Avenue East and NYS Route 322 (Balcom) | 2,238 |
| NYS Route 322 | Between Route 83 (Balcom) and Cattaraugus County Line | 1,798 |
| NYS Route 322 | CR 2 Main Street and Route 62 End 322 | 1,322 |
| NYS Route 322 | Between Cattaraugus County Line and CR 2 Main Street | 2,699 |
| NYS Thruway (I-90) | Between Exit 59 and Exit 58 | 29,781 |

Park, Recreation and Open Space Resources –Visitors traveling to this area may enjoy numerous outdoor recreational activities including hiking, biking, hunting, and fishing during the warmer months. Cross-country skiing and snowmobile riding are popular during the winter months. Other passive outdoor pursuits, such as bird watching or a leisurely drive through the county's wine country are also common. The Boutwell Hill Management Unit provides various recreational opportunities, as do a number of municipal parks. Some of the more prominent recreational facilities are discussed below.

Approximately three-quarters of the Boutwell Hill Management Unit, which is comprised of the Boutwell Hill State Forest and the Canadaway Creek Wildlife Management Area, are within the study area. The 5,124-acre Unit is a source of numerous types of outdoor activities including hunting, hiking, biking, horseback riding, and snowmobiling. Between Canadaway Creek WMA and Boutwell Hill State Forest, there are 6.2 miles of snowmobile and horse trails in winter and summer respectively. The Unit also includes 8.5 miles of the Earl Cardot Eastside Overland Trail.

- The Boutwell Hill State Forest consists of 2,964 acres of protected forest with numerous multi-use trails, wildlife viewing opportunities and it serves as a significant resource for deer hunters. In addition to its recreational offerings, the Forest also provides raw materials for New York's timber industry. Roughly half of Boutwell Hill State Forest is within the study area.
- The Canadaway Creek Wildlife Management Area, just south of the Town of Arkwright and north of the Boutwell Hill State Forest, is home to 2,160 acres of forest and its main purpose is to provide prime habitat for ruffed grouse. In addition to preservation efforts, the forest serves to provide numerous recreational opportunities including hiking, snowmobiling and bicycling. The majority of the Canadaway Creek Wildlife Management Area is within the study area.

[8] http://www.dot.state.ny.us

The Earl Cardot Eastside Overland Trail offers hiking and biking opportunities to users. It is comprised of 19 miles of trail extending from Twenty-Eighth Road in the Town of Gerry at the southernmost end, and terminates in the Town of Arkwright to the north. Of the 19 miles, roughly 8 are within the study area. This trail is maintained by Chautauqua County's Department of Public Works, Parks Division and County Park Commission.

Snowmobile trails may be found throughout the study area whether on public/private land or along roadways/seasonal roads. Snowmobiling is a popular activity throughout many sections of western New York and is likely enjoyed by large numbers of participants within the study area during the winter months. State snowmobile trails that bisect the area include, but are not limited to C1, C1A, C1B and C4. A number of these trails have significant portions that go through the different parcels of the Boutwell Hill Management Unit. The trails are generally funded by the State, but maintained by local snowmobile groups such as the Cherry Creek Snowmobile Club.

Tourism – This section of Chautauqua County draws visitors year-round, as it is ideal for a range of activities, including hiking, snowmobiling, cross-country skiing, and sight-seeing.

Cultural Resources - The State and National Register of Historic Places do not list any properties (within the study area) in the Towns of Villenova, Hanover, Perrysburg, Dayton, Cherry Creek, Arkwright, and Sheridan. Historically significant properties within the study area will be identified as part of the studies being prepared for the State Historic Preservation Office.

### 3.2.3 Visibility Evaluation of Inventoried Resources

Each inventoried visual resource was evaluated to determine whether a visual impact might exist. Generally, this consisted of reviewing viewshed maps, aerial photos, and field observations to determine whether or not individual resources would have a view of the proposed Project. Prior to the field observation, the coordinates of all proposed turbines were pre-programmed into a handheld GPS unit as a "waypoint." The GPS waypoint direction indicator (arrow pointing along calculated bearing) was used to determine the appropriate bearing to a desired turbine or grouping of turbines. Based on the bearing the observer was able to determine whether an unobstructed line-of-sight to the turbine or group of turbines was available.

Table 5 lists 55 visual resources located within the five-mile study area and identifies potential Project visibility. The location of these visual resources is referenced by numeric code within Figures 1 and 2. Of the 55 visual resources inventoried, 16 would likely be screened from the proposed Project by either intervening landform or vegetation and are thus eliminated from further study.

## Table 5 Visual Resource Visibility Summary

**Key**

● *Visibility Indicated*

○ *No Visibility Indicated*

◘ *Filtered view through trees or limited view through structures possible (field observed)*

| Map ID | Receptor Name | Municipality | Inventory Type | Potential Visibility: Theoretical View Indicated by Viewshed - Excluding Existing Vegetation (See Figure 1) | Potential Visibility: Theoretical View Indicated by Viewshed - Including Existing Vegetation (See Figure 2) | Potential Visibility: Actual View Likely Based on Field Confirmation of Existing Line-of-sight[9] |
|---|---|---|---|---|---|---|
| **Recreational and Tourist Resources** | | | | | | |
| 25 | Hill Side Acres (Western NY Land Conservancy) | Town of Arkwright | Local Importance | ● | ○ | ○ |
| 26 | Arkwright Hills Campground | Town of Arkwright | Local Importance | ○ | ○ | ○ |
| 35 | Woodside Country Campground | Town of Arkwright | Local Importance | ○ | ○ | ○ |
| 36 | Boutwell Hill State Forest and Overland Trail | Town of Arkwright | Statewide Significance | ● | ● | ● |
| 38 | Canadaway Creek WMA | Town of Arkwright | Statewide Significance | ● | ● | ● |
| 20 | American Legion Post 953 Ball Fields | Village of Forestville | Other Places for Analysis | ● | ● | ◘ |
| 21 | Village of Forestville Park | Village of Forestville | Other Places for Analysis | ● | ○ | ◘ |
| 22 | Walnut Falls | Village of Forestville | Other Places for Analysis | ○ | ○ | ○ |
| 7 | Tri-County Country Club | Town of Hanover | Local Importance | ● | ● | ● |
| 11 | Town of Hanover Park | Town of Hanover | Other Places for Analysis | ● | ○ | ○ |
| 51 | Village of South Dayton Park | Village of South Dayton | Other Places for Analysis | ● | ● | ◘ |
| **Highway Corridors/Roadside Receptors** | | | | | | |
| 28 | Center Road | Town of Arkwright | Other Places for Analysis | ● | ● | ● |
| 29 | Round Top Road | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 30 | Putnam Road | Town of Arkwright | Other Places for Analysis | ● | ● | ● |
| 32 | Farrington Hollow Road | Town of Arkwright | Other Places for Analysis | ● | ● | ● |
| 33 | NYS Route 83 | Town of Arkwright | Local Importance | ● | ● | ● |
| 6.1 | County Route 93 | Town of Hanover | Other Places for Analysis | ● | ● | ● |
| 8 | NYS Route 39 | Town of Hanover | Local Importance | ● | ● | ● |
| 9 | Hurlbert Road | Town of Hanover | Other Places for Analysis | ● | ● | ● |
| 12 | Hanover Road | Town of Hanover | Other Places for Analysis | ● | ● | ● |

[9] Field confirmation of potential visibility was conducted on April 30, 2008, and July 17, 2008. Refer 3.4.1 for additional information.

## Table 5 Visual Resource Visibility Summary

**Key**

● *Visibility Indicated*

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| Map ID | Receptor Name | Municipality | Inventory Type | Potential Visibility: Theoretical View Indicated by Viewshed - Excluding Existing Vegetation (See Figure 1) | Potential Visibility: Theoretical View Indicated by Viewshed - Including Existing Vegetation (See Figure 2) | Potential Visibility: Actual View Likely Based on Field Confirmation of Existing Line-of-sight[9] |
|---|---|---|---|---|---|---|
| 13 | NYS Thruway (I-90) | Town of Hanover | Local Importance | ● | ● | ● |
| 16 | Bennett State Road | Town of Hanover | Other Places for Analysis | ● | ● | ● |
| 17 | Bradigan Road | Town of Hanover | Other Places for Analysis | ● | ● | ● |
| 24 | Creek Road | Town of Hanover | Other Places for Analysis | ● | ○ | ● |
| 39 | Epolito Road | Town of Sheridan | Other Places for Analysis | ● | ● | ● |
| 2 | Prospect Road | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 3.1 | Flucker Hill Road | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 40 | County Route 72 | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 41 | South Hill Road | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 43 | Pope Hill Road | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 47 | NYS Route 322 | Town of Villenova | Other Places for Analysis | ● | ● | ● |
| 48 | NYS Route 83 | Town of Villenova | Local Importance | ● | ● | ● |
| **Residential/Community Resources** | | | | | | |
| 27 | Hamlet of Arkwright | Town of Arkwright | Local Importance | ● | ○ | ○ |
| 31 | Hamlet of Black Corners | Town of Arkwright | Local Importance | ● | ● | ● |
| 34 | Hamlet of Griswold | Town of Arkwright | Local Importance | ○ | ○ | ○ |
| 37 | Hamlet of Town Corners | Town of Arkwright | Local Importance | ● | ● | ● |
| 49 | Pine Valley Central Schools | Town of Cherry Creek | Local Importance | ● | ● | ● |
| 1 | Hamlet of Cottage | Town of Dayton | Local Importance | ● | ○ | ◘ |
| 3 | Hamlet of Nashville | Town of Hanover | Local Importance | ● | ● | ● |
| 5 | Hamlet of Balltown | Town of Hanover | Local Importance | ● | ○ | ○ |
| 6 | Hamlet of Parcells Corners | Town of Hanover | Local Importance | ● | ● | ● |
| 10 | Hamlet of Smiths Mills | Town of Hanover | Local Importance | ● | ● | ● |
| 14 | Hamlet of Dennison Corners | Town of Hanover | Local Importance | ● | ○ | ○ |
| 15 | Hamlet of Keaches Corners | Town of Hanover | Local Importance | ● | ○ | ◘ |

**Table 5 Visual Resource Visibility Summary**

**Key**

● *Visibility Indicated*

○ *No Visibility Indicated*

◘ *Filtered view through trees or limited view through structures possible (field observed)*

| Map ID | Receptor Name | Municipality | Inventory Type | Potential Visibility: Theoretical View Indicated by Viewshed - Excluding Existing Vegetation (See Figure 1) | Potential Visibility: Theoretical View Indicated by Viewshed - Including Existing Vegetation (See Figure 2) | Potential Visibility: Actual View Likely Based on Field Confirmation of Existing Line-of-sight[9] |
|---|---|---|---|---|---|---|
| 4 | Hamlet of West Perrysburg | Town of Perrysburg | Local Importance | ● | ○ | ○ |
| 23 | Hawkins Corner | Town of Sheridan | Local Importance | ● | ● | ● |
| 42 | Hamlet of Hamlet | Town of Villenova | Local Importance | ● | ● | ● |
| 44 | Hamlet of Wrights Corners | Town of Villenova | Local Importance | ● | ● | ● |
| 45 | Hamlet of Balcom | Town of Villenova | Local Importance | ● | ● | ● |
| 46 | Balcom Corners | Town of Villenova | Local Importance | ● | ● | ● |
| 18 | Forestville School Complex | Village of Forestville | Local Importance | ● | ○ | ○ |
| 19 | Village of Forestville | Village of Forestville | Local Importance | ● | ○ | ● |
| 50 | Village of South Dayton - Downtown | Village of South Dayton | Local Importance | ● | ● | ◘ |
| 52 | Village of South Dayton - Residential | Village of South Dayton | Local Importance | ● | ● | ● |
| 53 | Village of South Dayton/Hamlet of Skunks Corner | Village of South Dayton | Local Importance | ● | ● | ● |

### 3.2.4 Select Resources Beyond 5-Miles

Considering the scale of the proposed Project and recognizing the proposed wind turbines will, at times, be visible at distances greater than five miles, Saratoga completed a vegetated viewshed map to 7.5 miles around the outermost turbines. This viewshed map is presented in Appendix A. In addition, supplemental resources were identified outside the five-mile study area during the research completed for the VRA. Although not all-inclusive, the following resources were identified:

> Hatch Creek State Forest (Towns of Gerry and Ellington, NY; located 9.3 miles from the closest proposed turbine) - Hatch Creek is a 1,283 State Forest with several miles of snowmobile trails and forest roads, which can be utilized as hiking trails, traversing the forest from north to south. Hunting is a popular activity within Hatch Creek.

> Harris Hill State Forest (Towns of Gerry and Ellington, NY; located 9.5 miles from the closest proposed turbine) - The Harris Hill State Forest is 3,554 acres of hardwood and conifer forests make up Harris Hill State Forest. Hiking is a common activity at Harris Hill, and the Earl Cardot Eastside Overland Trail traverses roughly 4 miles of the Unit.

> Zoar Valley Multiple Use Area (Towns of Collins, Persia and Otto, NY; located 9.6 miles from the closest proposed turbine) - Zoar Valley is a 2,297-acre Multiple Use Area consisting of one of

New York State's last remaining old growth forests, and a steep canyon. Patron use of the Area is restricted to minimal-impact activities.

> Evangola State Park (Town of Brant, NY; located 9.9 miles from the closest proposed turbine) - Evangola State Park has 733 acres of lakeshore, woodlands, wetlands and an abundance of wildlife, including deer, wild turkey and red-tailed hawks. The park offers facilities for a variety of recreational activities, including picnicking, swimming, camping, tennis, volleyball and baseball. A large beachfront banquet is also available for rental.

> Seaway Trail (located 7.6 miles from the closest proposed turbine) - The New York State Seaway Trail runs for 454 miles along Lake Erie, Lake Ontario, the Niagara River and the St. Lawrence Seaway, and has been recognized by the US Department of Transportation (DOT) as one of America's Scenic Byway Trails. The Trail coincides with NYS Route 5 through the City of Dunkirk, and passes several historic markers for the War of 1812.

> Lake Erie (located 7.1 miles from the closest proposed turbine) - The Lake has the fourth largest surface area of the Great Lakes and averages 571 feet above sea level. The Lake and its shoreline are a popular seasonal destination due to its abundant opportunities for water recreation (e.g. boating fishing, swimming), scenic vistas from the shoreline, shoreline parks (including State and local parks), and shopping.

## 3.3 Factors Affecting Visual Impact

To bring order to the consideration of visual resources, the inventory of visual resources is organized into several recognizable elements, as follows:

### 3.3.1 Landscape Units

Landscape units are areas with common characteristics of landform, water resources, vegetation, land use, and land use intensity. While a regional landscape may possess diverse features and characteristics, a landscape unit is a relatively homogenous, unified landscape of visual character. Landscape units are established to provide a framework for comparing and prioritizing the differing visual quality and sensitivity of visual resources in the study area. Discrete landscape units were identified through field inventory and air photo interpretation, and divide the study area into zones of unique patterns and visual composition. Within the visual resources study area, four distinctive landscape units were defined. These landscape units, their general landscape character, and use are as follows:



Village Center – The study area contains the Villages of South Dayton and Forestville, and a small portion of the Village of Perrysburg. These villages are primarily residential and commercial community centers. Built structures and streets dominate the visual landscape. Each village includes a small downtown area based around a main thoroughfare.

Generally, built structures and streets dominate the visual landscape in each of the villages. Trees line many of the roadways. Most buildings are one to three stories tall, including brick and wood frame structures. Buildings are a mix of older architectural styles (e.g. predominately Federal and Late Victorian) interspersed with conventional, more modern, mid- to late-20th century residences. Some of the older buildings are very well maintained or restored while others are in various states of disrepair or alteration. Views are generally short distance and focused along streets (which are typically arranged in a grid/block pattern). Structures and trees generally block most distant views, however, filtered or framed views are possible through foreground vegetation and buildings from the perimeter of the villages. Development density drops sharply as one moves away from the central business district as the Village Center landscape unit transitions to the Rural Agricultural Landscape Unit.



Views within the Village Center landscape unit may be considered to be of moderate visual quality depending on the character and composition of built and natural features within view.

Rural Hamlet – Rural hamlets are characterized by low to medium density clusters of older residential dwellings and very limited to no retail or commercial services. Buildings are typically one to two stories tall, and include brick commercial blocks and wood frame structures. Buildings styles are an interesting mix of older architectural styles (e.g. Federal, Late Victorian, Italianate) interspersed with more modern, utilitarian styles as well as pre-manufactured homes.

A number of rural crossroad hamlets exist within the study area. These areas vary in size but are generally typified by a small group of houses in an otherwise rural area. Most hamlets occur at road intersections, such as that between a state route and county route. Residences (a mix of old and new and of varying maintenance) and accessory structures (barns, garages, etc.) are a main feature of rural hamlets. Places of worship, community buildings and general stores are also common.



Roadside residences and street trees often reinforce axial views along the highway. Views are typically short distance and directed towards the main thoroughfare and adjacent structures. Structures and trees generally block most views, however, filtered or framed views beyond the hamlet may exist through foreground vegetation. Development density drops almost immediately as one travels away from the hamlet center; transitioning quickly to the character of the surrounding Rural Agricultural Landscape Unit.

The study area includes 16 definitive hamlets. The hamlets of Hamlet, Laona, Cottage, Griswold, Black Corners, and Balcom are representative of this landscape unit.

Views found within the Rural Hamlet Landscape Unit may be considered to be of moderate visual quality depending on the character and composition of built and natural features within view.

Rural Agricultural Landscape Unit – This landscape unit is predominantly a patchwork of open land, including working cropland/pastures and a succession of old-fields transected by property-line hedgerows, occasionally interspersed with woodlots. The terrain itself consists of relatively level topography with gentle low-lying hills and small rounded hillocks primarily under a thousand feet high, but including a few that are up to roughly 1,800 feet. Within this Unit, population densities are very low and structures are sparsely located. Uses are predominantly agricultural and very low-density residential. Minor areas of commercial use are occasionally found along the roadside. Building stock consists primarily of permanent homes and manufactured housing, along with accessory structures (barns, garages, sheds, etc.). Structures are of varying vintage and quality. Poorly maintained or dilapidated structures and properties are not uncommon sights.



Views within the Rural Agricultural Landscape Unit are often short distance, contained by foreground vegetation and surrounding mountains. However, distant vistas are common from higher elevations across down-slope agricultural lands. Narrow and curving roads often provide an interesting series of short views of the rural landscape, but also force drivers to direct their attention to the road rather than the adjacent scenery. Some local residents and visitors may regard the aesthetic character of this landscape unit as an attractive and pastoral setting; others may view it as a working landscape, similar in character with much of rural western New York.

Views within the Rural Agricultural Landscape Unit may be considered of moderate visual quality.



Forest Land – Forest cover dominates large areas throughout the study area. In addition to privately owned forested land, the study area contains the Boutwell Hill State Forest and the Canadaway Creek Wildlife Management Area. Vegetation is predominantly mature second growth deciduous woodland with occasional stands of evergreen cover. The State owned property may include paved and unimproved roads and trails that are commonly used for hiking, snowshoeing, nature viewing, snowmobiling, horseback riding, and in some instances may be used for cross-country skiing.[10] Hunting is also permitted on designated sections of State owned property.

Within this landscape unit, dense forest typically prevents distant vistas. However, views beyond the immediate foreground may occur in discrete hillside locations where openings in the forest cover permit. Filtered views through woodland vegetation may also be available during leaf-off seasons.

Views found within the Forest Land landscape unit may be considered to be of moderate to high visual quality depending on the character and composition of built and natural features within view

### 3.3.2 Viewer/User Groups

Viewers engaged in different activities, while in the same landscape unit, are likely to perceive their surroundings differently. The description of viewer groups is provided to assist in understanding the sensitivity and probable reaction of potential observers to visual change resulting from the proposed Project.

Local Residents - These individuals would view the proposed Project from homes, businesses, and local roads. Except when involved in local travel, such viewers are likely to be stationary and could have frequent and/or prolonged views of the Project. They know the local landscape and may be sensitive to changes in particular views that are important to them. Conversely, the sensitivity of an individual observer to a specific view may be diminished over time due to repeated exposure.

Through Travelers - Commuters and through travelers would view the proposed Project from highways. These viewers are typically moving and focusing on the road in front of them.

[10] Activities may vary depending on resource.

Consequently, their views of the proposed wind energy Project may be peripheral, intermittent, and/or of relatively brief duration. Given a general unfamiliarity or infrequent exposure to the regional or local landscape, travelers are likely to have a lower degree of sensitivity to visual change than would local residents and workers.

Recreational Users - This group generally includes all local residents involved in outdoor recreational activities, as well as visitors who come to the area specifically to enjoy the cultural, recreational, scenic resources, and open spaces of Chautauqua County.

The sensitivity of recreational users to visual quality is variable; but to many, visual quality is an important and integral part of the recreational experience. The presence of wind turbines may diminish the aesthetic experience for those that believe the rural landscape should be preserved for agricultural, rural residential, open space and similar uses. Such viewers will likely have high sensitivity to the visual quality and landscape character, regardless of the frequency of duration of their exposure to the proposed Project. For those with strong utilitarian beliefs, the presence of the proposed Project will have little aesthetic impact on their recreational experience.

While the scenic quality of the local landscape is an important aspect of the recreational experience for most visitors, viewers will also be cognizant of various foreground details, developments and other visually proximate activities. Visitors and recreational users currently view the existing working landscape, low to moderate-density roadside residential and commercial uses of varying aesthetic quality, as well as utility infrastructure.

A greater number of recreational users will be present in the region when the weather is clear and warm as compared to overcast, rainy or cold days. In addition, more recreational users will be present on weekends and holidays than on weekdays.

Tourists – This group generally includes year-round and seasonal residents involved in outdoor recreational activities, as well as visitors who come to the area specifically to enjoy the recreational, scenic resources, and open spaces of the Western New York region.

The sensitivity of recreational users to visual quality is variable; but to many, visual quality is an important and integral part of the recreational experience. The presence of wind turbines may diminish the aesthetic experience for those that believe that the rural landscape should be preserved for agricultural, open space and similar uses. Such viewers will likely have high sensitivity to the visual quality and landscape character, regardless of the frequency or duration of their exposure to the proposed Project.

While the scenic quality of the region is an important aspect of the recreational experience for most visitors, viewers will also be cognizant of various foreground details and developments and other visually proximate activities. Visitors and recreational users currently view existing low density roadside residential and commercial uses of varying aesthetic quality, as well as utility infrastructure, and occasional hilltop communications towers.

Greater numbers of recreational users will be present in the region, when the weather is appropriate for the recreational activity (e.g. clear as compared to overcast, rainy days). In addition, more recreational users will be present on weekends and holidays than on weekdays.

It is important to note that Lake Erie, a tourist attraction to Chautauqua County, is not within the study area. The lakefront provides numerous activities for boating, fishing, sightseeing and shopping.

### 3.3.3 Distance Zones

Distance affects the apparent size and degree of contrast between an object and its surroundings. Distance can be discussed in terms of distance zones, e.g., foreground, middleground and background. Distance zones established by the U.S. Forest Service and reiterated by the NYSDEC Visual Policy are used in this VRA. A description of each distance zone is provided below to assist in understanding the effect of distance on potential visual impacts.

Foreground (0-½ mile) - At a foreground distance, viewers typically have a very high recognition of detail. Cognitively, in the foreground zone, human scale is an important factor in judging spatial relationships and the relative size of objects. From this distance, the sense of form, line, color and textural contrast with the surrounding landscape is highest. The visual impact is likely to be considered the greatest at a foreground distance.

Middleground (½ mile to 3 miles) - This is the distance where elements begin to visually merge or join. Colors and textures become somewhat muted by distance, but are still identifiable. Visual detail is reduced, although distinct patterns may still be evident. Viewers from middleground distances characteristically recognize surface features such as tree stands, building clusters and small landforms. Scale is perceived in terms of identifiable features of development patterns. From this distance, the contrast of color and texture are identified more in terms of the regional context than by the immediate surroundings.

Background (3-5 miles to horizon) - At this distance, landscape elements lose detail and become less distinct. Atmospheric perspective[11] changes colors to blue-grays, while surface characteristics are lost. Visual emphasis is on the outline or edge of one landmass or water resource against another with a strong skyline element.

### 3.3.4 Duration/Frequency/Circumstances of View

The analysis of a viewer's experience must include the distinction between stationary and moving observers. The length of time and the circumstances under which a view is encountered is influential in characterizing the importance of a particular view.

[11] Atmospheric Perspective: Even on the clearest of days, the sky is not entirely transparent because of the presence of atmospheric particulate matter. The light scattering effect of these particles causes a reduction in the intensity of colors and the contrast between light and dark as the distance of objects from the observer increases. Contrast depends upon the position of the sun and the reflectance of the object, among other items. The net effect is that objects appear "washed out" over great distances.

Stationary Views - Stationary views are experienced from fixed viewpoints. Fixed viewpoints include residential neighborhoods, recreational facilities, historic resources and other culturally important locations. Characteristically, stationary views offer sufficient time, either from a single observation or repeated exposure, to interpret and understand the physical surroundings. For this reason, stationary viewers have a higher potential for understanding the elements of a view than do moving viewers.

Stationary views can be further divided to consider the effect of short-term and long-term exposure. Sites of long-term exposure include any location where a stationary observer is likely to be visually impacted on a regular basis, such as from a place of residence. Sites of short-term exposure include locations where a stationary observer is only visiting, such as recreational facilities. Although the duration of visual impact remains at the discretion of the individual observer, short-term impacts are less likely to be repeated for a single observer on a regular basis.

Moving Views - Moving views are those experienced in passing, such as from moving vehicles, where the time available for a viewer to cognitively experience a particular view is limited. Such viewers are typically proceeding along a defined path through highly complex stimuli. As the tendency of automobile occupants is to focus down the road, the actual time a viewer is able to focus on individual elements of the surrounding landscape may be a fraction of the total available view time. Obviously, a driver is most affected by driving requirements.

Conversely, the greater the contrast of an element within the existing landscape, the greater the potential for viewer attention, even if viewed for only a moment by a moving viewer. Billboards along a rural highway, designed to attract attention and recognition, are an example of this condition. Furthermore, an element is more likely to be perceived in greater detail by local residents to whom it is experienced on a daily basis than it is to passers-by.

### 3.3.5 Summary of Affected Resources

As listed in Table 5, of the original 55 inventoried visual resources, 16 would likely be screened from the proposed Project by either intervening landform or vegetation and are thus eliminated from further study. Table 6 summarizes the factors affecting visual impact (landscape unit, viewer group, distance zone and duration/frequency/circumstances of view) described above for each visual resource determined to have a potential view of the proposed Project.

## Table 6 Visual Resource Impact Summary

| Map ID | Receptor Name | Municipality | Inventory Type | Approximate Number of Turbines Visible (see Figure 2) | Factors Affecting Visual Impact: Landscape Unit | Viewer/User Group(s) | Distance (miles) /Distance Zone (nearest turbine) | Moving/ Stationary |
|---|---|---|---|---|---|---|---|---|
| 1 | Hamlet of Cottage | Town of Dayton | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 3.4/Background | Stationary |
| 2 | Prospect Road | Town of Villenova | Other Places for Analysis | 58 | Rural Agricultural | Local residents/workers | 0.3/Foreground | Moving |
| 3 | Hamlet of Nashville | Town of Hanover | Local Importance | 2 | Rural Hamlet | Travelers, Local residents/workers | 1.7/Middleground | Stationary |
| 3.1 | Flucker Hill Road | Town of Villenova | Other Places for Analysis | 60 | Rural Hamlet | Local residents/workers | 1.7/Middleground | Moving |
| 4 | Hamlet of West Perrysburg | Town of Perrysburg | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 3.6/Background | Stationary |
| 5 | Hamlet of Balltown | Town of Hanover | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 2.9/Middleground | Stationary |
| 6 | Hamlet of Parcells Corners | Town of Hanover | Local Importance | 1 | Rural Hamlet | Travelers, Local residents/workers | 0.6/Middleground | Stationary |
| 6.1 | County Route 93 | Town of Hanover | Other Places for Analysis | 39 | Rural Hamlet | Local residents/workers | 0.5/Middleground | Moving |
| 7 | Tri-County Country Club | Town of Hanover | Local Importance | 11 | Rural Agricultural | Recreational | 0.2/Foreground | Stationary |
| 8 | NYS Route 39 | Town of Hanover | Local Importance | 46 | Rural Agricultural | Travelers, Local residents/workers | 0.3/Foreground | Moving |
| 9 | Hurlbert Road | Town of Hanover | Other Places for Analysis | 17 | Rural Agricultural | Local residents/workers | 0.3/Foreground | Moving |
| 10 | Hamlet of Smiths Mills | Town of Hanover | Local Importance | 19 | Rural Hamlet | Travelers, Local residents/workers | 2.7/Middleground | Stationary |
| 11 | Town of Hanover Park | Town of Hanover | Other Places for Analysis | 0 | Rural Agricultural | Recreational | 3.3/Background | Stationary |
| 12 | Hanover Road | Town of Hanover | Other Places for Analysis | 45 | Rural Agricultural | Local residents/workers | 4.6/Background | Moving |
| 13 | NYS Thruway (I-90) | Town of Hanover | Local Importance | 48 | Rural Agricultural | Travelers, Local residents/workers | 4.9/Background | Moving |
| 14 | Hamlet of Dennison Corners | Town of Hanover | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 3.3/Background | Stationary |
| 15 | Hamlet of Keaches Corners | Town of Hanover | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 3.6/Background | Stationary |
| 16 | Bennett State Road | Town of Hanover | Other Places for Analysis | 8 | Rural Agricultural | Local residents/workers | 3.4/Background | Moving |
| 17 | Bradigan Road | Town of Hanover | Other Places for Analysis | 1 | Rural Agricultural | Local residents/workers | 1.9/Middleground | Moving |
| 18 | Forestville School Complex | Village of Forestville | Local Importance | 0 | Village Center | Local residents/workers | 3.3/Background | Stationary |
| 19 | Village of Forestville | Village of Forestville | Local Importance | 0 | Village Center | Travelers, Local residents/workers | 3.2/Background | Stationary |
| 20 | American Legion Post 953 Ball Fields | Village of Forestville | Other Places for Analysis | 3 | Village Center | Recreational | 3.4/Background | Stationary |
| 21 | Village of Forestville Park | Village of Forestville | Other Places for Analysis | 0 | Village Center | Recreational | 3.6/Background | Stationary |
| 22 | Walnut Falls | Village of Forestville | Other Places for Analysis | 0 | Village Center | Recreational | 3.4/Background | Stationary |
| 23 | Hawkins Corner | Town of Sheridan | Local Importance | 34 | Rural Hamlet | Travelers, Local residents/workers | 4.7/Background | Stationary |
| 24 | Creek Road | Town of Hanover | Other Places for Analysis | 0 | Rural Agricultural | Local residents/workers | 2.9/Middleground | Moving |

## Table 6 Visual Resource Impact Summary

| Map ID | Receptor Name | Municipality | Inventory Type | Approximate Number of Turbines Visible (see Figure 2) | Factors Affecting Visual Impact: Landscape Unit | Viewer/User Group(s) | Distance (miles) /Distance Zone (nearest turbine) | Moving/ Stationary |
|---|---|---|---|---|---|---|---|---|
| 25 | Hill Side Acres (Western NY Land Conservancy) | Town of Arkwright | Local Importance | 0 | Rural Agricultural | Recreational | 1.9/Middleground | Stationary |
| 26 | Arkwright Hills Campground | Town of Arkwright | Local Importance | 0 | Rural Agricultural | Recreational | 4.1/Background | Stationary |
| 27 | Hamlet of Arkwright | Town of Arkwright | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 3.3/Background | Stationary |
| 28 | Center Road | Town of Arkwright | Other Places for Analysis | 60 | Rural Agricultural | Local residents/workers | 3.5/Background | Moving |
| 29 | Round Top Road | Town of Villenova | Other Places for Analysis | 38 | Rural Agricultural | Local residents/workers | 0.2/Foreground | Moving |
| 30 | Putnam Road | Town of Arkwright | Other Places for Analysis | 34 | Rural Agricultural | Local residents/workers | 0.8/Middleground | Moving |
| 31 | Hamlet of Black Corners | Town of Arkwright | Local Importance | 10 | Rural Hamlet | Travelers, Local residents/workers | 1.6/Middleground | Stationary |
| 32 | Farrington Hollow Road | Town of Arkwright | Other Places for Analysis | 47 | Rural Agricultural | Local residents/workers | 1.6/Middleground | Moving |
| 33 | NYS Route 83 | Town of Arkwright | Local Importance | 57 | Rural Agricultural | Travelers, Local residents/workers | 2.5/Middleground | Moving |
| 34 | Hamlet of Griswold | Town of Arkwright | Local Importance | 0 | Rural Hamlet | Travelers, Local residents/workers | 3.8/Background | Stationary |
| 35 | Woodside Country Campground | Town of Arkwright | Local Importance | 0 | Forest Land | Recreational | 4.1/Background | Stationary |
| 36 | Boutwell Hill State Forest and Overland Trail | Town of Arkwright | Statewide Significance | 60 | Forest Land | Recreational | 3.6/Background | Stationary |
| 37 | Hamlet of Town Corners | Town of Arkwright | Local Importance | 47 | Rural Hamlet | Travelers, Local residents/workers | 2.5/Middleground | Stationary |
| 38 | Canadaway Creek WMA | Town of Arkwright | Statewide Significance | 60 | Forest Land | Recreational | 2.3/Middleground | Stationary |
| 39 | Epolito Road | Town of Sheridan | Other Places for Analysis | 12 | Rural Agricultural | Local residents/workers | 3.2/Middleground | Moving |
| 40 | County Route 72 | Town of Villenova | Other Places for Analysis | 32 | Rural Agricultural | Local residents/workers | 1.6/Middleground | Moving |
| 41 | South Hill Road | Town of Villenova | Other Places for Analysis | 28 | Rural Agricultural | Local residents/workers | 1.5/Middleground | Moving |
| 42 | Hamlet of Hamlet | Town of Villenova | Local Importance | 19 | Rural Hamlet | Travelers, Local residents/workers | 1.2/Middleground | Stationary |
| 43 | Pope Hill Road | Town of Villenova | Other Places for Analysis | 51 | Rural Agricultural | Local residents/workers | 0.2/Foreground | Moving |
| 44 | Hamlet of Wrights Corners | Town of Villenova | Local Importance | 28 | Rural Hamlet | Travelers, Local residents/workers | 1.1/Middleground | Stationary |
| 45 | Hamlet of Balcom | Town of Villenova | Local Importance | 38 | Rural Hamlet | Travelers, Local residents/workers | 1.7/Middleground | Stationary |
| 46 | Balcom Corners | Town of Villenova | Local Importance | 39 | Rural Hamlet | Travelers, Local residents/workers | 1.8/Middleground | Stationary |
| 47 | NYS Route 322 | Town of Villenova | Local Importance | 38 | Rural Agricultural | Travelers, Local residents/workers | 2.0/Middleground | Moving |
| 48 | NYS Route 83 | Town of Villenova | Local Importance | 47 | Rural Agricultural | Travelers, Local residents/workers | 3.0/Background | Moving |
| 49 | Pine Valley Central Schools | Town of Cherry Creek | Local Importance | 21 | Rural Agricultural | Local residents/workers | 4.0/Background | Stationary |

## Table 6 Visual Resource Impact Summary

| Map ID | Receptor Name | Municipality | Inventory Type | Approximate Number of Turbines Visible (see Figure 2) | Factors Affecting Visual Impact: Landscape Unit | Viewer/User Group(s) | Distance (miles) /Distance Zone (nearest turbine) | Moving/ Stationary |
|---|---|---|---|---|---|---|---|---|
| 50 | Village of South Dayton - Downtown | Village of South Dayton | Local Importance | 27 | Village Center | Travelers, Local residents/workers | 3.4/Background | Stationary |
| 51 | Village of South Dayton Park | Village of South Dayton | Other Places for Analysis | 4 | Village Center | Recreational | 3.5/Background | Stationary |
| 52 | Village of South Dayton - Residential | Village of South Dayton | Local Importance | 38 | Village Center | Local residents/workers | 3.5/Background | Stationary |
| 53 | Village of South Dayton/Hamlet of Skunks Corner | Village of South Dayton | Local Importance | 36 | Village Center | Travelers, Local residents/workers | 3.2/Background | Stationary |

## 3.4 Degree of Project Visibility

### 3.4.1 Field Observation and Photography

On April 30, 2008, and July 17, 2008 a field crew drove public roads and visited many of the potentially affected visual resources (as determined through viewshed mapping) to document existing visibility in the direction of proposed wind turbines. All photographs were taken from affected visual resources using a 12.2-mega pixel digital camera with a lens setting of approximately 50mm[12] to simulate normal human eyesight relative to scale. The location selected for each photograph was judged by the field observer to be the most unobstructed line-of-sight to the turbine area from the subject visual resource. Photographs were taken at various times of the day in order to illustrate how the turbines would be seen under different lighting conditions (e.g. backlit, etc). In doing so, the photographer made every attempt to minimize the effect of glare within the camera's field of view.

The precise coordinates of each photo location were recorded in the field using a handheld global positioning system (GPS) unit. To determine the direction of the proposed wind turbines from each photo location, the precise coordinates of all proposed turbines were pre-programmed into the GPS as a "waypoint." The GPS waypoint direction indicator (arrow pointing along calculated bearing) was used to determine the appropriate bearing for the camera, so that a desired turbine, or grouping of turbines, would be generally centered in the field of view of each photograph.

Weather conditions on all days in the field generally ranged from partly cloudy to sunny.

### 3.4.2 Photo Simulations

Selection of Key Receptors for Photo Simulation - To demonstrate how the actual turbines will appear within the study area from a variety of distances and locations, 14 representative photo simulations were prepared. The specific location of these simulations was chosen for their relevance to the factors affecting visual impact (viewer/user groups, landscape units, distance zones and duration/frequency and circumstances of view discussed above.

These simulations do not include views from all potentially affected

**Table 7 Key Receptors Selected for Photo Simulation**

| Map ID | Receptor Name |
|---|---|
| 2 | Prospect Road |
| 3.1 | Flucker Hill Road |
| 6.1 | County Route 93 |
| 7 | Tri-County Country Club |
| 8 | NYS Route 39 |
| 13 | NYS Thruway (I-90) |
| 33 | NYS Route 83 |
| 36 | Boutwell Hill State Forest and Overland Trail |
| 38 | Canadaway Creek WMA |
| 42 | Hamlet of Hamlet |
| 47 | NYS Route 322 |
| 48 | NYS Route 83 |
| 49 | Pine Valley Central Schools |
| 53 | Village of South Dayton/Hamlet of Skunks Corner |

[12] A Canon EOS Rebel XT digital SLR with a 24-85milimeter (mm) zoom lens was used for all Project photography. This digital camera, similar to most digital SLR cameras, has a sensor that is approximately 1.6 times smaller than a comparable full frame 35mm film camera. Recognizing this differential, the zoom lens used was set to approximately 31mm to achieve a field-of-view comparable to a 50mm lens on a full frame 35mm camera (31mm x 1.6 = 50mm).

visual resources, but rather provide representative examples of how the proposed Project will appear under varying circumstances of distance and landscape character. Table 7 lists the key receptors selected for photo simulation.

Because the visibility of wind turbines will most commonly affect local residents from rural homes and during daily travel along local roads, and most open vistas of the Project typically occur in isolated locations along rural roadways, views selected for photo simulation favor such views even though the number of viewers will not be large.

The location of simulated views, as well as all photo simulations are presented in Appendix A.

Photo Simulation Methodology - A photo simulation of the proposed Project was prepared from each key receptor location. Photo simulations were developed by superimposing a rendering of a three-dimensional computer model of the proposed Project into the base photograph taken from each corresponding visual resource (see section 3.4.1). The three-dimensional computer model was developed in *Autodesk Architectural Desktop, Land Development Desktop* and *Autodesk Viz* (Viz) software.

Simulated perspectives (camera views) were then matched to the corresponding base photograph for each simulated view by replicating the precise coordinates of the field camera position (as recorded by GPS) and the focal length of the camera lens used (50mm). Precisely matching these parameters assures scale accuracy between the base photograph and the subsequent simulated view. The camera's target position was set to match the bearing of the corresponding existing condition photograph as recorded in the field. With the existing conditions photograph displayed as a "viewport background," minor camera adjustments were made (horizontal and vertical positioning, and camera roll) to align the horizon in the background photograph with the corresponding features of the 3D model.

The appearance of the turbines is based on the specifications of GE 1.5MW turbines with 80 m (263 ft.) high towers and 77 m rotor diameter (126 ft. long blades). The turbine model was constructed so that the apex of the blade is 389 feet above ground elevation.

The proposed condition model was rendered using the base photograph as a "Viz background environment map." The 3D model was rendered using sunlight settings approximating the date and time of day the base photograph was taken. To the extent practicable, and to the extent necessary to reveal impacts, design details of the proposed turbines were built into the 3D model and incorporated into the photo simulation. Consequently, the scale, alignment, elevations and location of the visible elements of the proposed facilities are true to the conceptual design. The rendered view was then opened using *Adobe Photoshop 7.0* software for post-production editing (i.e., airbrush out portion of turbines that fall below foreground topography and vegetation).

Arms Length Rule - The photo simulations included in Appendix A have been printed using an 11"x17" page format. At this image size, the page should be held at approximately arms length[13] so that the scene will appear at the correct scale. Viewing the image closer would make the scene appear too large and viewing the image from greater distance would make the scene appear too small compared to what an observer would actually see in the field.

For viewing photo simulations at other page sizes (i.e., computer monitor, projected image or other hard copy output) the viewing distance/page width ratio is approximately 1.5/1. For example, if the simulation were viewed on a 42-inch wide poster size enlargement, the correct viewing distance would be approximately 63 inches, or 5 ¼ feet.

Field Viewing - The photo simulations present an accurate depiction of the appearance of proposed turbines suitable for general understanding of the degree and character of Project visibility. However, these images are a two-dimensional representation of a three-dimensional landscape. The human eye is capable of recognizing a greater level of detail than can be illustrated in a two-dimensional image. Agency decision-makers and interested parties may benefit from viewing the photo simulations in the field from any or all of the simulated vantage points. In this manner, observers can directly compare the level of detail visible in the base photograph with actual field observed conditions.

## 3.5 Character of Project Visibility

### 3.5.1 Compatibility with Regional Landscape Patterns

The visual character of a landscape is defined by the patterns, forms and scale relationships created by lines, colors, and textures. Some patterns dominate while others are subordinate. The qualitative impact of a Project is the effect the development has on these patterns, and by corollary on, the visual character of the regional landscape.

Existing Landscape - The visible patterns (form, line, color, and texture) found within the Project region can best be described as representative of the agricultural landscape typical of the region. Given the rural nature of the study area, visible colors are natural, muted shades of green, brown, gray, and other earth tones. When viewed from a distance, the landscape maintains a rather uniform and unbroken blending of colors, which tend to fade with hazing of varying atmospheric conditions.

The following describes the compatibility of the proposed Project with regional landscape patterns within which it is contained and viewed. This evaluation is graphically depicted in the photographic simulations provided in Appendix A.

Form - The form of the regional landscape is essentially a planar landscape. The woodland edge of agricultural fields commonly creates a brief vertical offset of the prevailing planar form. The proposed wind energy Project will be comprised of 60 thin, tapered vertical structures distributed throughout the

[13] Viewing distance is calculated based a 39.6-degree field-of-view for the 50mm camera lens used, and the 15.5" wide image presented in Appendix A. "Arm's length" is assumed to be approximately 22.5 inches from the eye. Arm's length varies for individual viewers.

landscape; topped with large rotating blades. The introduction of such clearly man-made and kinetic structures creates a noticeable visual disruption of the agricultural landscape.

Line – The existing landscape maintains a horizontal line formed by extended vistas over an agricultural plain that often forms the visible horizon. The well-defined vertical form of 60 turbines that may be visible across this plain introduces a contrasting and distinct perpendicular element into the landscape. Views will commonly include multiple turbines at varying distances from the viewer. It is anticipated that the turbines will most commonly be viewed in an off-axis manner creating the appearance of a rather random arrangement.

Color – Generally, the neutral off-white color of the proposed turbine tower, nacelle and blades will be viewed against the background sky. Under these conditions the turbines would be highly compatible with the hue, saturation and brightness of the background sky and distant elements of the natural landscape. When the turbines are backlit (turbine facing viewer is in shade) it is anticipated that it will be less compatible with the background sky as the turbines will have the potential to be a dark object being viewed against a light background. Color contrast will decrease with increasing distance and/or periods of increased atmospheric haze or precipitation.

Texture – Tubular style monopole towers have been specifically selected, instead of skeletal (or lattice) frame towers, to minimize textural contrast and provide a more simple, visually appealing form.

Scale/Spatial Dominance – The proposed wind turbines will be the tallest visible elements on the horizon and will be disproportionate to other elements (e.g. silos) commonly visible on the regional landscape. From most foreground and middleground vantage points the contrast of the proposed turbines with commonly recognizable features, such as structures and trees, will result in the proposed Project being perceived as a highly dominant visual element. However, when viewed from background vantage points, perceived scale and spatial dominance of the turbines begins to lessen.

### 3.5.2 Visual Character during the Construction Period

Construction of the proposed wind turbines will require use of large mobile cranes and other large construction vehicles. Turbine components will be delivered in sections via large semi-trucks. The construction period for each turbine is expected to be quite short. As such, construction related visual impacts will be brief and are not expected to result in adverse prolonged visual impact to area residents or visitors.

## 3.6 Shadow Flicker Analysis

Wind turbines can cause a flickering effect when the rotating turbine blades cast shadows that move across the ground and nearby structures. This can cause a disturbance within structures when the repeating pattern of light and shadow falls across the un-shaded windows of buildings, particularly when occupants are trying to read or watch television. The effect, known as shadow flicker, is most conspicuous when windows face a rotating wind turbine and when the sun is low in the sky (e.g., shortly after sunrise or shortly before sunset).

While the study of shadow flicker is a relatively new discipline, evidence from operational turbines suggests that the intensity of shadow flicker is only an issue at short distances. It is generally accepted that shadow flicker will have no affect on properties at a distance further than ten (10) turbine rotor diameters from the turbine.[14] Shadow flicker will only occur when certain conditions coincide:

- Daylight hours (sunrise to sunset) – shadow flicker does not occur at night;
- Sunshine – flicker will not occur on foggy or overcast days when daylight is not sufficiently bright to cast shadows;
- Receptor is within ten (10) rotor diameters of the turbine – beyond this distance a person should not perceive a wind turbine to be chopping through sunlight, but rather as an object with the sun behind it.[15]
- Windows face the turbine – turbine shadows can only enter a structure through unshaded windows; and
- Turbine is rotating – no flicker will occur when the turbine is not in operation.

Because of constantly changing solar aspect and azimuth, shadows will be cast on specific days of the year and will pass a stationary receptor relatively quickly. Flicker will not be an everyday event or be of extended duration when it does occur. For receptors (i.e. residential dwellings) located to the west of a turbine, a residence is more likely to fall within the shadow zone shortly after sunrise when affected residents are typically asleep with shades drawn. For receptors located to the east of a turbine, a residence is more likely to fall within the shadow zone shortly before sunset (see Figure 4 for typical shadow pattern).

When the rotor plane is in-line with the sun and receptor (as seen from the receptor), the cast shadows will be very narrow, of low intensity, and will move quickly past the stationary receptor. When the rotor plane is perpendicular to the sun-receptor "view line," the cast shadow of the blades will move within a larger elliptical area.

The distance between a wind turbine and a receptor affects the intensity of the shadows cast by the blades, and therefore the intensity of flickering. Shadows cast close to a turbine will be more intense, distinct and "focused." This is because a greater proportion of the sun's disc is intermittently blocked. Similarly, flickering is more intense if created by the area of a blade closer to the rotor and further from the tip. Beyond ten (10) turbine diameters the intensity of the blade shadow is considered negligible and at such a distance there will be virtually no, or limited, distinct chopping of the sunlight.

### 3.6.1 Shadow Flicker Methodology

Shadow-flicker analysis was conducted using *WindPRO 2.4 Basis* software (WindPro), and associated shadow module, a widely accepted modeling software package developed specifically for the design and evaluation of wind power projects. Variables used for shadow calculations include:

[14] http://www.meridianenergy.co.nz
[15] http://www.dti.gov.uk

> Sunshine probabilities (percentage of time from sunrise to sunset with sunshine) – The WindPro model calculates shadow frequency based on monthly sunshine probabilities. The following sunshine probabilities were used for this analysis and are based on historic meteorological data for Buffalo, NY, approximately 50 miles northeast of the Project site.[16]

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31% | 38% | 46% | 51% | 56% | 65% | 67% | 64% | 57% | 50% | 29% | 27% |

> Operational Time/Rotor Orientation – The WindPro model assumes there will be no shadow flicker during calm winds (when the blades are not turning). Moreover, the orientation of the rotor (e.g., determined by wind direction) affects the size of a shadow cast area. To more accurately calculate the amount of time a shadow will be over a specific location (based on rotor orientation), the WindPro model considers typical wind direction. The following operational time (hours per year [hrs/yr]) of wind direction is based on meteorological data collected by Noble from December 2006 to July 2008:

| N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 250 | 212 | 212 | 214 | 158 | 241 | 854 | 893 | 805 | 781 | 820 | 1,110 | 901 | 572 | 388 | 349 |

The shadow flicker analysis has been undertaken for the proposed 60-turbine layout using a turbine rotor of 77 meters in diameter and an 80-meter hub height. The frequency of flickering is directly related to the rotor speed and number of blades on the rotor. The turbine used in this Project has three blades and a maximum rotation speed of approximately 18 revolutions per minute. This analysis has been completed for distances of 2,950 feet (approximately 900 meters, which exceeds the ten (10) rotor diameters of 770 meters) from each turbine location. A distance of 770 meters was exceeded in order to evaluate the potential shadow flicker on receptors that were in close proximity to this limit. This analysis also includes the effect of topography on potential shadow area. The shadow flicker model incorporates the same digital elevation model (DEM) of the study area used for viewshed analysis (description of DEM is described above).

Using these variables, WindPro was used to calculate the theoretical number of hours per year the shadow of a rotor would fall at any given location within the 2,950-foot turbine radius. This calculation includes the cumulative sum of shadow hours for all turbines and is accurate to a 10-meter grid cell resolution. Providing cumulative hours for a receptor does not take into account activities within the dwelling (i.e. rooms of primary use and enjoyment versus less frequently occupied rooms) or account for the direction/location of windows. Figure 5, illustrates the geographic area of cumulative shadow impact using the following increments:

> 0-2 hrs/yr;
> 2-10 hrs/yr;
> 10-20 hrs/yr;
> 20-30 hrs/yr;
> 30-40 hrs/yr; and
> 40+

[16] http://ggweather.com (data for Buffalo, NY)

WindPro does not have the capability to incorporate the possible screening effect of existing vegetation. To account for this more realistic condition, a second shadow limit map was prepared excluding areas determined through viewshed analysis to be screened from turbine visibility by existing vegetation. This vegetated condition shadow limits map, although not considered absolutely definitive, acceptably identifies the geographic area within which one would expect to be substantially screened from turbine shadows by intervening forest vegetation. Figure 6, illustrates the geographic area of cumulative shadow impact including the screening effect of existing vegetation.

### 3.6.2 Shadow Flicker Impact on Existing Structures

There are 157 existing structures located within a 2,950-foot radius of the proposed turbines. These structures were identified through a combination of air-photo interpretation and field verification. Each existing structure was evaluated to determine potential shadow impact. Table 8 summarizes the number of hours per year each inventoried structure would theoretically fall within the shadow zone of one or more proposed turbine. The location of inventoried structures is included in Figure 5 and Figure 6.

Table 8 Shadow Flicker Summary

| Map ID* | Maximum Potential Shadow Hours per Year[17] | Does the Receptor Have Visibility of the Project?[18] | Map ID* | Maximum Potential Shadow Hours per Year | Does the Receptor Have Visibility of the Project? |
|---|---|---|---|---|---|
| 1 | 1:18 | Yes | 74 | 9:02 | Yes |
| **2** | **4:42** | **Yes** | 75 | 7:58 | Yes |
| 3 | 8:09 | Yes | 76 | 2:23 | Yes |
| **4** | **58:12** | **Yes** | 77 | 2:18 | Yes |
| 6 | 14:56 | Yes | 78 | 4:45 | Yes |
| 7 | 9:36 | Yes | 95 | 5:39 | Yes |
| 8 | 4:50 | Yes | 96 | 3:24 | Yes |
| 9 | 3:51 | Yes | 97 | 5:27 | Yes |
| 10 | 0:00 | No | 98 | 0:00 | No |
| 27 | 0:00 | No | **99** | **11:25** | **Yes** |
| **28** | **3:36** | **Yes** | 102 | 4:35 | Yes |
| **29** | **12:34** | **Yes** | 103 | 32:48 | Yes |
| **30** | **15:51** | **Yes** | 104 | 19:47 | Yes |
| 32 | 4:39 | No | 106 | 6:41 | Yes |
| 33 | 9:52 | Yes | **115** | **10:25** | **Yes** |
| 34 | 6:31 | Yes | 116 | 0:00 | No |
| 35 | 2:25 | Yes | 117 | 0:00 | Yes |
| 36 | 0:00 | Yes | **118** | **0:00** | **Yes** |
| 37 | 3:24 | Yes | **119** | **0:00** | **Yes** |
| 48 | 7:30 | Yes | **120** | **0:00** | **No** |
| 49 | 0:58 | Yes | 121 | 7:53 | Yes |

[17] Hours based on topography only.
[18] Visibility based on topography and vegetation viewshed data used for Figure 2.

## Table 8 Shadow Flicker Summary

| Map ID* | Maximum Potential Shadow Hours per Year[17] | Does the Receptor Have Visibility of the Project?[18] | Map ID* | Maximum Potential Shadow Hours per Year | Does the Receptor Have Visibility of the Project? |
|---|---|---|---|---|---|
| 50 | 0:00 | Yes | 122 | 4:41 | Yes |
| 51 | 0:00 | Yes | **123** | **4:59** | **Yes** |
| 52 | 0:00 | No | 124 | 0:00 | No |
| 53 | 0:00 | No | 125 | 0:00 | No |
| 54 | 0:00 | No | **126** | **0:00** | **No** |
| 55 | 0:00 | No | **127** | **0:00** | **No** |
| 56 | 0:00 | No | 128 | 12:09 | Yes |
| 57 | 0:00 | No | 129 | 15:21 | Yes |
| 58 | 0:00 | No | 130 | 0:00 | No |
| 59 | 0:00 | No | **131** | **22:47** | **Yes** |
| 63 | 0:00 | No | **132** | **0:00** | **No** |
| 69 | 13:23 | Yes | 133 | 2:37 | Yes |
| 70 | 8:11 | Yes | 134 | 13:53 | Yes |
| 71 | 5:23 | Yes | 135 | 20:50 | Yes |
| 72 | 14:49 | Yes | 136 | 21:07 | Yes |
| 73 | 2:11 | Yes | 137 | 10:25 | Yes |
| **138** | **0:00** | **No** | 191 | 26:18 | Yes |
| 140 | 9:31 | Yes | 192 | 18:25 | Yes |
| **141** | **11:06** | **Yes** | **193** | **23:31** | **Yes** |
| 142 | 3:36 | Yes | 194 | 12:01 | Yes |
| 143 | 49:37 | Yes | 195 | 19:03 | Yes |
| 144 | 29:34 | Yes | **197** | **4:52** | **Yes** |
| **145** | **48:04** | **Yes** | 198 | 8:27 | Yes |
| 146 | 21:19 | Yes | 199 | 5:37 | Yes |
| 147 | 26:38 | Yes | 200 | 8:27 | Yes |
| 148 | 14:51 | Yes | 201 | 5:14 | Yes |
| 149 | 3:26 | Yes | 202 | 15:51 | Yes |
| **159** | **6:00** | **Yes** | **203** | **11:34** | **Yes** |
| **161** | **11:43** | **Yes** | **204** | **16:00** | **Yes** |
| 162 | 18:48 | Yes | 205 | 30:11 | Yes |
| 163 | 22:21 | Yes | **206** | **30:13** | **Yes** |
| **164** | **19:16** | **Yes** | **207** | **13:51** | **Yes** |
| **165** | **28:25** | **Yes** | **208** | **0:00** | **No** |
| **166** | **15:40** | **Yes** | 209 | 2:11 | Yes |
| **167** | **20:25** | **Yes** | 210 | 3:30 | Yes |
| **168** | **9:40** | **Yes** | 211 | 7:08 | Yes |
| 169 | 22:32 | Yes | 212 | 19:01 | Yes |
| 170 | 19:38 | Yes | 213 | 5:19 | Yes |
| 171 | 8:30 | Yes | 214 | 3:09 | Yes |
| 172 | 0:00 | Yes | **215** | **2:01** | **No** |
| 173 | 1:59 | No | 220 | 12:24 | Yes |

Table 8 Shadow Flicker Summary

| Map ID* | Maximum Potential Shadow Hours per Year[17] | Does the Receptor Have Visibility of the Project?[18] | Map ID* | Maximum Potential Shadow Hours per Year | Does the Receptor Have Visibility of the Project? |
|---|---|---|---|---|---|
| 174 | 7:36 | Yes | 222 | 3:34 | Yes |
| 175 | 2:17 | Yes | 223 | 3:18 | Yes |
| **176** | **2:04** | **Yes** | 224 | 2:19 | Yes |
| 179 | 0:00 | No | 228 | 2:39 | Yes |
| 180 | 0:00 | No | 230 | 3:14 | Yes |
| 181 | 0:00 | No | 231 | 3:46 | Yes |
| 182 | 8:20 | Yes | 232 | 2:56 | Yes |
| 183 | 20:39 | Yes | 233 | 2:46 | Yes |
| 184 | 32:53 | Yes | 234 | 11:06 | Yes |
| **185** | **44:03** | **Yes** | 235 | 9:40 | Yes |
| **186** | **29:26** | **Yes** | 236 | 11:36 | Yes |
| **187** | **51:31** | **Yes** | 237 | 4:20 | Yes |
| **188** | **62:18** | **Yes** | 238 | 2:38 | Yes |
| 189 | 55:38 | Yes | 240 | 28:33 | Yes |
| 190 | 27:36 | Yes | 241 | 0:00 | No |
| 242 | 3:39 | Yes | 244 | 9:55 | Yes |
| 243 | 0:00 | Yes | | | |

* Those receptors (residences) located in Figures 5 and 6 are presented in this table. Those in bold text identify those residential structures with landowners who are participating in the Project

Of the 157 studied shadow receptors located within 900 meters of the turbines (based on topography only):

- 37 (23.6%) will theoretically be impacted 0-2 hrs/yr;
- 63 (40.1%) will theoretically be impacted 2-10 hrs/yr;
- 30 (19.1%) will theoretically be impacted 10-20 hrs/yr;
- 16 (10.2%) will theoretically be impacted 20-30 hrs/yr;
- 4 (2.5%) will theoretically be impacted 30-40 hrs/yr; and
- 7 (4.5%) will theoretically be impacted 40+ hrs/yr.

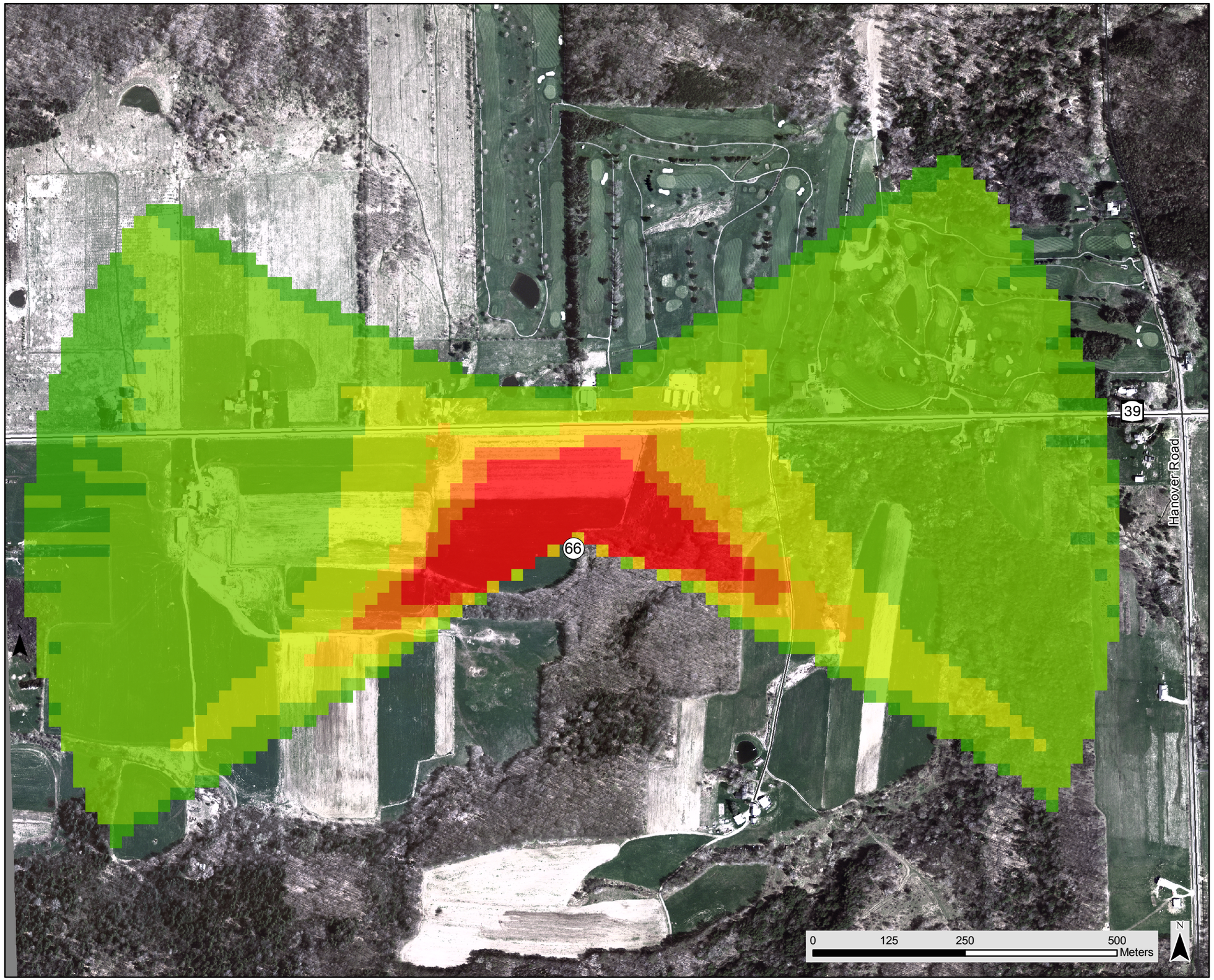
There are 11 receptors that will theoretically be impacted more than 30 hours per year. These include:

- Receptor 4 (58:12 hours);
- Receptor 103 (32:48 hours);
- Receptor 143 (49:37 hours);
- Receptor 145 (48:04 hours);
- Receptor 184 (32:53 hours);
- Receptor 185 (44:03 hours);
- Receptor 187 (51:31 hours);
- Receptor 188 (62:18 hours);

- Receptor 189 (55:38 hours);
- Receptor 205 (30:11 hours); and
- Receptor 206 (30:13 hours).

Of those receptors that exceed 30 hours, six (6) receptors are landowners who are participating in the Project, the remaining five (5) receptors (103, 143, 184, 189, and 205) will have views of the Project and will be subjected to shadow-flicker. In addition, based on the data presented in Table 8, 28 of the 157 receptors will not have visibility of the Project. It is anticipated that those receptors without a view of the Project will not be impacted by the shadow caused by the turbines.

There are no regulations or guidelines that establish an acceptable degree of shadow-flicker impact on a potential receptor. Based on the limited number of hours any structure may be impacted, shadow flicker is not expected to create an adverse impact on most nearby residential dwellings. For residences where shadow flicker is greatest, this impact might be considered an annoyance by some, and unnoticed by others. For those that find the shadow flicker an annoyance, mitigation of the disturbance within a specific room may be implemented by the use of window shades.




# TYPICAL SHADOW PATTERN FROM TURBINE 66

## Noble Ball Hill Windpark

Figure 4
September 2008

KEY

66 Proposed Wind Turbine

Shadow Hours Per Year

- < 2
- 2 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- > 40

PROJECT # 2007 - 07097.10M

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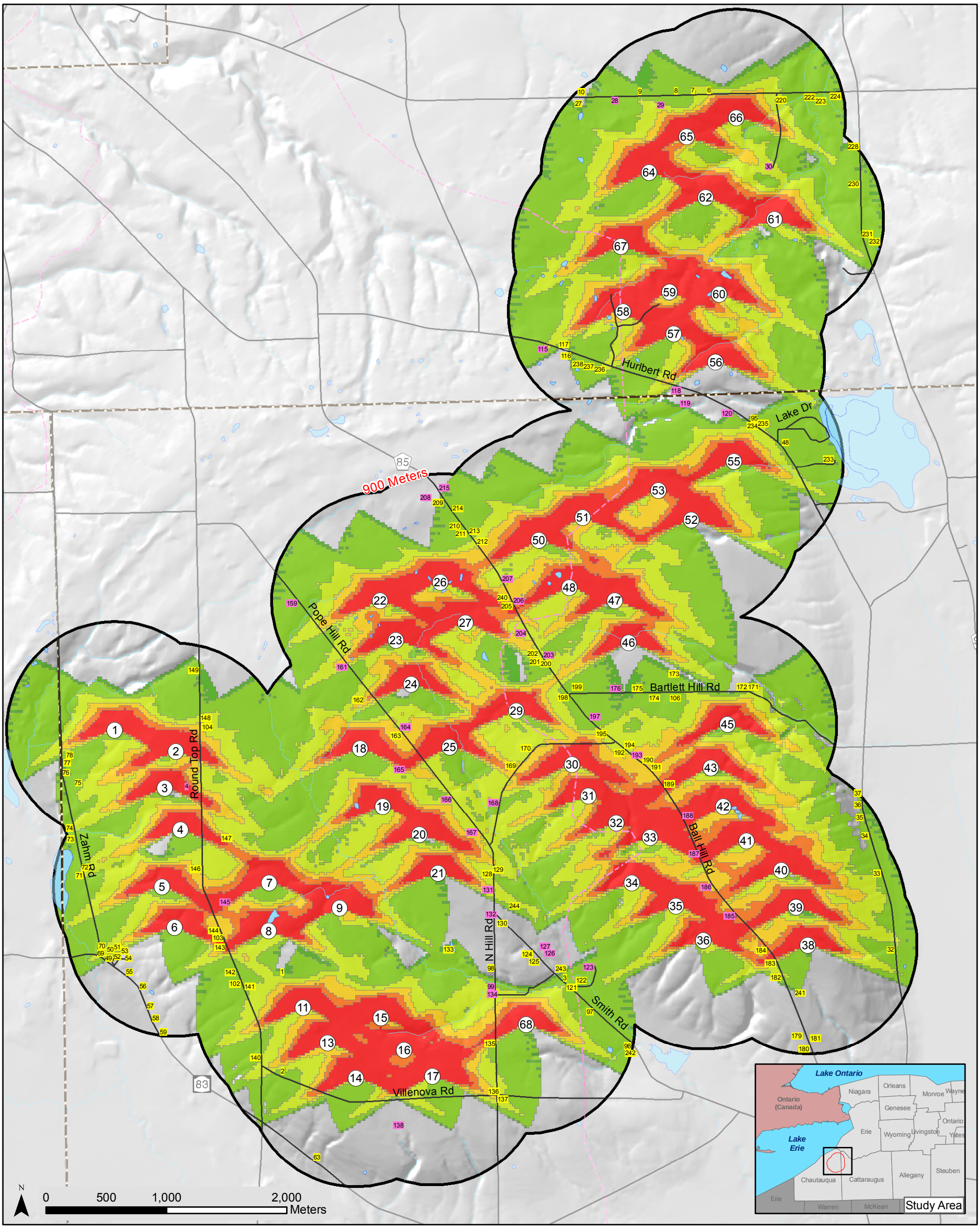


# TOPOGRAPHIC SHADOW FLICKER ANALYSIS

## Noble Ball Hill Windpark

Figure 5
September 2008

KEY

- ① Proposed Wind Turbine
- Participating Houses
- Non-Participating Houses
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Water Body
- State Forest
- Wildlife Management Area

Shadow Hours Per Year

- < 2
- 2 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- > 40

PROJECT # 2007 - 07097.10M

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# VEGETATED SHADOW FLICKER ANALYSIS

## Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure 6
September 2008

KEY

- ① Proposed Wind Turbine
- Participating Houses
- Non-Participating Houses
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Water Body
- State Forest
- Wildlife Management Area

Shadow Hours Per Year

- < 2
- 2 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- > 40

PROJECT # 2007 - 07097.10M

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## 3.7 Cumulative Analysis

A cumulative analysis of the proposed Project and the proposed New Grange Wind Farm was completed as part of this VRA. The proposed New Grange Wind Farm is located within the Projects five-mile study area. The New Grange Wind Farm consists of 47 1.8 MW turbines and are generally bounded by Straight Road to the north, Creek Road/Farrington Hollow Road to the east, CR 72 to the south, and Miller Road/Park Road to the west. The cumulative analysis of these two (2) proposed projects include a vegetated viewshed map and two (2) simulations.

### 3.7.1 Cumulative Viewshed

A cumulative viewshed map (Appendix B – Figure B1) was created to show where there was a possibility to see the proposed Project as well as the proposed New Grange Wind Farm from a specific location within the Projects five-mile study area.

The viewshed map, based on topography and vegetation, follows the same methodology discussed under section 3.1.1, above. The heights used for the cumulative viewshed map are:

- Noble Ball Hill Windpark (60 turbines) – a conservative height of 393' to blade tip (same height in Figures 1 and 2); and

- New Grange Wind Farm (47 turbines proposed by New Grange Wind Farm, LLC) – 410' blade tip height.

Within the Projects five-mile study area, the potential visibility of the two (2) wind projects were further quantified to illustrate the number of turbines that may be visible from the previously identified sensitive resources and any given area. This cumulative degree of visibility is summarized on Table 9.

**Table 9 Cumulative Viewshed Coverage Summary**

| | **Vegetation and Topography Viewshed** (Figure B1 - Cumulative Vegetated Viewshed Analysis) | |
|---|---|---|
| | **Acres*** | **Percent cover** |
| No Structures Visible | 64,791 | 65.0% |
| 1-5 Structures Visible | 4,778 | 4.8% |
| 6-10 Structures Visible | 3,693 | 3.7% |
| 11-15 Structures Visible | 3,335 | 3.3% |
| 16-20 Structures Visible | 2,646 | 2.6% |
| 21-35 Structures Visible | 6,912 | 6.9% |
| 36-50 Structures Visible | 5,914 | 5.9% |
| 51-60 Structures Visible | 2,658 | 2.6% |
| 61-90 Structures Visible | 4,229 | 4.2% |
| 91-107 Structures Visible | 1,064 | 1.0% |
| Total | 100,022 | 100.0% |

* Acreage quantities are rounded to nearest whole number.

### 3.7.2 Viewshed Analysis

Based on Table 9 the total cumulative visibility of the proposed wind projects is approximately 35,231 acres. When compared to the viewshed completed for the Noble Ball Hill Windpark this is an increase of 6,026 acres. Theoretically, one or more turbines would be visible from approximately 35% of the entire five-mile Project study area (comprised of 100,022 acres). Generally, visibility of the wind projects may be found on higher elevations along road corridors or open agricultural lands.

In addition, the introduction of additional turbines within the same viewshed will increase the number of structures visible from most affected vantage points – thus creating a potential higher density of visible turbines.

As previously discussed, several factors suggest that actual visibility of the projects from many areas within the study area may be further reduced.

### 3.7.3 Photo Simulations

Selection of Key Receptors for Photo Simulation – Two (2) locations were identified for simulations. The specific location of these simulations was chosen for their relevance to the factors affecting visual impact (e.g. viewer/user groups, landscape units, distance zones and duration/frequency). Table 10 lists the key receptors selected for photo simulation.

**Table 10 Key Receptors Selected for Cumulative Photo Simulation**

| Map ID | Receptor Name |
|---|---|
| 2 | Prospect Road |
| 33 | NYS Route 83 |

All cumulative photo simulations are presented in Appendix B.

## 3.8 115 kV Transmission Line

As a result of the proposed Project, it will be necessary to construct a 6-mile 115 kV transmission line. The proposed transmission line will include a new substation, switchyard, and 73 new tangent and angle structures (i.e. transmission towers).

The proposed transmission line will be placed on monopole wood laminated structures varying in height from 55.5 and 75 feet, all but two poles will be between 65.5 and 75 feet high. The route of the transmission line will start at a new 200 by 300 foot substation located approximately 800 feet north of Hurlbert Road (east of Empire Road) in the Town of Hanover. The substation will then tie into a new 115 kV transmission line. The transmission line will be located within a 100-foot Right-of-Way (ROW) and continue in a northerly direction where it will terminate at a 300 by 500 foot switchyard with an interconnection to an existing transmission line owned and operated by National Grid (photo to the right) at the southeast corner of the Bennett State Road and Stebbins Road intersection.



Generally, the basic components of the substation and switchyard are a control house, a main transformer (substation only), outdoor circuit breakers, capacitor banks, relaying equipment, high voltage bus work, metal clad switchgear, steel support structures, an underground grounding grid, and overhead lightning suppression conductors. It is anticipated that the substation will be similar in characteristic to the built Noble Bliss Windpark substation (photo to the right).



The transmission line will require vegetation clearing along certain portions of new ROW. The newly cleared ROW will be allowed to return to a partial vegetative state (low scrub/shrub or agricultural crops); however, trees along the ROW will be permanently cleared so as not to interfere with the Proposed Transmission Line once it is in operation.

### 3.8.1 Transmission Line Viewshed

To calculate the maximum area of potential visibility, one control point was established at the high point for each of the 73 structures located between the proposed substation and switchyard. The resulting viewsheds identify the geographic area within a 3-mile radius where some portion of the proposed transmission line is theoretically visible based on intervening topography and/or existing mature vegetation (Appendix C - Figures C2 and C3).

**Table 11 Transmission Line Viewshed Coverage Summary**

| | Topography Only Viewshed (Figure C2 – Transmission Line Topographic Viewshed) | | Vegetation and Topography Viewshed (Figure C3 – Transmission Line Vegetated Viewshed) | |
|---|---|---|---|---|
| | **Acres** | **Percentage of Study Area** | **Acres** | **Percentage of Study Area** |
| No Structures Visible | 12,945 | 33% | 30,690 | 78.3% |
| 1-5 Structures Visible | 2,037 | 5.3% | 2,097 | 5.3% |
| 6-10 Structures Visible | 1,223 | 3.1% | 1,106 | 2.9% |
| 11-15 Structures Visible | 1,302 | 3.3% | 908 | 2.3% |
| 16-20 Structures Visible | 1,548 | 3.9% | 684 | 1.7% |
| 21-35 Structures Visible | 3,931 | 10.1% | 1,261 | 3.2% |
| 36-50 Structures Visible | 4,141 | 10.6% | 1,401 | 3.7% |
| 51-73 Structures Visible | 12,046 | 30.7% | 1,027 | 2.6% |
| Total | 39,176 | 100.0% | 39,176 | 100.0% |

*Table 11 and Figure C2 illustrates that one or more structures are theoretically visible from approximately 67 percent of the 3-mile radius. However, as discussed above, this unrealistic treeless condition analysis is used only to identify the maximum potential geographic area within which further investigation is appropriate. This viewshed is not representative of the anticipated geographic extent of visibility and is not intended for public interpretation. Acreage is rounded to the nearest whole number.

### 3.8.2 Viewshed Analysis

Table 11 and Figure C3 illustrates that one or more of the proposed transmission structures will theoretically be visible from approximately 22 percent of the 3-mile radius, and that approximately 78 percent of this area will likely have no visibility of any of the structures. Visibility is most common from properties adjacent or in close proximity to the proposed transmission line, as well as areas to the north, east, and west. Visibility will also be evident from agricultural uplands with cleared lands and down slope vistas in the direction of the proposed transmission line.

As shown on the vegetated viewshed, there is potential for high visibility along roadways located within the northern half of the 3-mile study area. Open views of the proposed transmission line will be available from many roadways where roadside vegetation is lacking. These roadways would include, but are not limited to, the NYS Thruway (I-90), Hanover Road, County Route 89, Bennett State Road, and King Road. Many of these views may be fleeting as viewers pass in vehicles, or short in duration.

The proposed transmission line will also bisect five (5) roadways including, NYS Route 39. Proposed transmission structures will be located in close proximity and on both sides of these roadways. Viewers within close proximity to the proposed transmission line will also notice that structures will frequently appear and disappear behind intervening foreground landform and vegetation as they move about the study area.

Viewshed mapping also shows that there is a potential for visibility of the structures within the Villages of Forestville and Silver Creek. Based on a field investigation, it is anticipated that visibility would be substantially reduced by screening (e.g. structures and localized vegetation), the relatively long distance between the village and the proposed transmission line, and the generally low/slim profile of the proposed structures.

### 3.8.3 Photo Simulations

Selection of Key Receptors for Photo Simulation – Two (2) photo simulations were prepared to show how the proposed transmission line would appear in the landscape. The locations were selected within close proximity to the transmission line so that visibility of the slender transmission structures would be the greatest. Table 12 lists the key locations selected for photo simulation.

**Table 12 Key Locations Selected for Photo Simulation**

| Map ID | Receptor Name |
|---|---|
| T1 | NYS Route 39 |
| T2 | King Road |

The appearance of the structures is based on details provided by Noble. The heights of the structures range from 55.5 to 75 feet. Details of the structures are contained in Appendix C (Figure C1).

All transmission line photo simulations are presented in Appendix C.

# 4.0 MITIGATION PROGRAM

## Professional Design

- Wind turbine design is largely driven by aerodynamic efficiency. Noble is limited in selection of turbine styles to designs presently offered by wind turbine manufacturers. To minimize visual complexity, tubular style towers will be used instead of lattice frame towers to simplify visual form.
- Roads will be designed to generally follow topographic contours to minimize cut and fill and will be located in agricultural lands to the greatest extent possible to minimize vegetative cuts.
- Proposed turbines will not be used for commercial advertising, or include conspicuous lettering or corporate logos identifying the Project owner or equipment manufacturer.
- Noble will maximize to the extent possible the subsurface routing of electrical interconnects used to transmit power from between turbine locations.

## Screening

- Considering the proposed Project includes 60 wind turbines that will be visible over a wide viewshed area, traditional treatments such as fences, earthen berms and vegetative screening cannot be applied in an effective manner to screen these major structures.
- In the event visibility of the proposed substation, switchyard and operations/maintenance buildings are clearly visible from the public right-of-way and is of concern to the community, perimeter plantings may be used to further minimize visibility of these structures.
- Window shades may be utilized by residences in the event shadows cast by the turbines become a nuisance.

## Project Siting/Relocation

- The proposed Project is located in the Towns of Villenova and Hanover for the following reasons:
  - Favorable elevation and exposure of the Project area which is well suited for receiving prevailing winds;
  - Reliable winds that meet the necessary criteria for a commercially viable wind energy project; and
  - The relatively low population of the Project area.

By their very nature, modern wind energy projects are large and highly visible facilities. The need to position wind turbines in areas of higher elevation cannot be readily avoided. Given the necessary scale of wind energy turbines and the number of turbines required for a sustainable project, there is no opportunity to substantially relocate the Project or any of its components to other sites in the Towns where it would be significantly less visible.

- Proposed turbines will maintain a minimum setback from residential structures. Such separation of uses assures maximum screening benefit of existing woodland vegetation, where such exists, and minimizes the potential for extended duration shadow flicker on nearby residences.
- Vegetation clearing along the transmission line ROW, as well as around the base of the turbines should be kept to a minimum, however it should not impede operation.

### Camouflage/Disguise

- The color of the blades, nacelle, and tower will be a neutral off-white. While the FAA mandates this color for aviation safety, this color is well suited to minimize visual contrast with the background sky.
- By utilizing wood laminated poles for the transmission structures (not including the substation and switchyard), the color and materials of the structures will be compatible with the surrounding landscape.

## Low Profile/Downsizing

- The profile of the wind turbines is dictated by operational efficiency. Because wind turbine power extraction is a function of the cube of wind speed (relatively large increases in power from small increases in wind speed), the height of a tower plays an important role in overall energy production. Reducing the height of the turbines to a meaningful degree would substantially reduce the amount of energy produced rendering the development of the Project impractical or would require constructing a greater number of smaller units to be economically viable.

### Alternate Technologies

- Wind energy itself is an alternative to traditional energy sources. Meaningful development of renewable wind energy will reduce reliance on fossil fuel combustion and nuclear fission facilities and result in reduction in air pollutants and greenhouse gasses. A single 750-kilowatt (0.75MW) wind turbine, operated for one year at a site with Class 4 wind speeds (winds averaging 12.5-13.4 mph at 10 meters height), can be expected to displace a total of 1,179 tons (2.36 million pounds) of carbon dioxide, 6.9 tons of sulfur dioxide, and 4.3 tons of nitrogen oxides, based on the U.S. average utility generation fuel mix. More wind power means less smog, acid rain, and greenhouse gas emissions.[19]
- Alternative turbines have been considered (see Section 1.3 of the DEIS) for this Project. While smaller turbines might be marginally less visible, a greater number would be required to provide the same energy output, resulting in increased visual impacts from higher blade rotation rate and higher density. Likewise, a fewer number of larger wind turbine generators would require turbines of increased height and/or rotor diameter which would be more prominent in the landscape. Visually, a change in the height or number of turbines may provide a minimal benefit at a particular receptor, but it would do little to change the overall impact of the Project on the regional landscape.

[19] American Wind Energy Association, Wind Energy Fact Sheet, Wind Energy – the Fuel of the Future is Ready Today (http://www.awea.org)

### Non-specular Materials

- Wind turbine towers will be painted metal structures and blades will be painted fiberglass composite. Where specifications permit, non-specular paint will be used on all outside surfaces to minimize reflected glare.
- Many of the proposed transmission poles will be wood laminated, and therefore will not be reflective. Although the proposed substation/switchyard involves metallic equipment and structures these elements are sufficiently removed from sensitive receptors and do not warrant painting of metallic surfaces.

### Lighting

- Due to the height of the proposed turbines, the Federal Aviation Administration requires red flashing aviation obstruction lighting be placed atop the nacelle on approximately 34 of the 60 turbines to assure safe flight navigation in the vicinity of the Project. This federally mandated safety feature cannot be omitted or reduced. If appropriate, alternative approved FAA lighting options will be evaluated to determine if they can minimize the visual impact within the study area.
- Lighting for the substation should be down firing, motion triggered, and task oriented (e.g. maintenance and emergency).

### Maintenance

- How a landscape and structures in the landscape are maintained has aesthetic implications to the long-term visual character of a project. Noble places a high priority on facility maintenance, not only for operational purposes, but for aesthetic appearance as well. Recognizing that its public image will be directly linked to the outward appearance of its facilities and desiring to be a welcomed member of the community, Noble will implement a strict policy of maintenance, including materials and practices that ensure a clean and well-maintained appearance over the full life of the facility.

### Decommissioning

- The lifespan of the primary Project components is approximately 20 years. The wind turbines could be repaired indefinitely to extend their useful life. However, it is likely that advancements in technology within this time will make upgrades or replacement of the turbines a more attractive alternative. However, in the unlikely event that the site is to be abandoned, Noble has developed a complete Decommissioning Plan which is included in the DEIS as Appendix Q. The Decommissioning Plan for the Project includes detailed cost estimates for the removal of Project components to a depth of four feet below grade. This will include the wind turbines, including the tower, nacelle, transformer, electrical components, concrete foundations, and maintenance roads. The Plan also describes the specific steps that will be taken in removing the wind turbines, including the tower, nacelle, transformer, electrical components, transmission lines, concrete foundations, and maintenance roads/rigging pads. Restoration of the areas after removal will include re-vegetation to return the area to as near its present condition as possible.

- When the transmission line, substation, and switchyard structures are no longer be necessary, they should be removed. Disturbed areas will become re-established as natural or cultivated vegetation over time.

# 5.0 SUMMARY AND DISCUSSION OF POTENTIAL VISUAL IMPACT

## Visibility Summary

The vegetated viewshed map clearly indicate that one or more of the proposed turbines will be theoretically visible from approximately 29 percent of the five-mile radius study area (based on vegetative viewshed). Approximately 71 percent of the study area will likely have no visibility of any wind turbines. Visibility is most common in the agricultural uplands from cleared lands with down slope vistas in the direction of turbine groupings.

While viewshed mapping indicates that the Project will be visible within portions of the Village of South Dayton and the Village of Forestville, as well as hamlets scattered throughout the study area, field confirmation determined the prevalence of mature street trees and site landscaping combined with one to three story residential and commercial structures. Because of this, views will generally be screened by intervening vegetation and localized structures, although filtered or framed views are likely through foreground vegetation and buildings were found from isolated locations. Direct views are more prevalent on the outskirts of these community centers where localized residential and commercial structures, street trees and site landscaping are less likely to provide a visual barrier.

Open views of the Project will be available from many roadways where roadside vegetation is lacking. These roadways would include, but are not limited to, the NYS Thruway, NYS Routes 39, 83, and 322, County Routes 93 and 87, North and South Hill Road, Pope Hill Road, Farrington Hollow Road, Round Top Road, Aldrich Hill Road, Hanover Road, and Flucker Hill Road. Many of these views may be long distant (background view), fleeting as viewers pass in vehicles, or short in duration.

No views, or limited views will occur on the backside of the many hills and within ravines found throughout the five-mile study area. Where topography is oriented toward the turbines, dense forest cover commonly prevents distant views.

The area most directly affected by views of the Project will be where there is a significant amount of cleared or agricultural land within immediate proximity to the Project. Residents and visitors will regularly encounter proximate views of one or more turbines within the foreground and near-middle-ground distances (e.g., ½ to 1 ½ miles). This is also the distance at which the visual contrast of the turbines will be greatest. Within such close proximity, turbines frequently appear and disappear behind intervening foreground landforms and vegetation as viewers move about the Project area.

## Impact on Visual Resources

Resources of Statewide Significance - Viewshed analysis, field investigation, and simulations determined that the visual resources of Statewide Significance (Boutwell Hill State Forest and Canadaway Creek WMA) would not be notably affected by the proposed Project. Views from these resources were field verified from the property boundaries, which the vegetated viewshed analysis indicated having the highest potential for visibility; also it is anticipated that overall visibility would be minimal within the boundaries of the State-owned land due to the vegetative screening witnessed in the field.

In addition, five (5) resources were identified, beyond the five-mile study area, during the completion of the VRA. Based solely on results determined through the use of vegetated viewshed data, all will have minimal visibility of the Project. Those resources and potential visibility consist of:

- Evangola State Park consists of 733 acres, of which 54 acres have the potential for visibility.
- Harris Hill State Forest consists of 3,554, of which 7 acres have the potential for visibility.
- Zoar Valley Multiple Use Area consists of 2,297 acres, of which 73 acres have the potential for visibility.
- Hatch Creek State Forest consists of 1,283, of which no acres have the potential for visibility.
- 5.25 miles of the Seaway Trail (NYS Route 5) falls within 7.5-miles of the Project (Figure A1). 1.8 miles or 34% percent of that length has potential visibility of the Project. Potential visibility is further reduced by screening (vegetation and structures) in developed areas such as the Village of Silver Creek.

The NYSDEC visual Policy states,

> *"Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Significant aesthetic impacts are those that may cause a diminishment of the public enjoyment and appreciation of an inventoried resource, or one that impairs the character or quality of such a place. Proposed large facilities by themselves should not be a trigger for a declaration of significance. Instead, a project by virtue of its siting in visual proximity to an inventoried resource may lead staff to conclude that there may be a significant impact."*

Based on this definition, it is reasonable to conclude that simple visibility of the proposed wind farm (albeit a large facility) from any of these affected resources of statewide significance does not imply detrimental effect on the perceived beauty of the place or structure; nor will the Project necessarily cause the diminishment of public enjoyment and appreciation of an inventoried resource, or impair the character or quality of such a place.

Resources of Local Interest – Because of the number, scale and distribution of the proposed turbines, some portion of the Project will be visible from places of local interest, that do not necessarily meet the broader statewide threshold for visual significance. Most commonly affected are roadside views along various county and local roadways (for example, see Figures A3-A5).

Views were found along portions of several county and town roads at varying distance. Most residential neighborhoods and other resources (e.g. playgrounds) located in the villages, hamlets, and throughout the study area where the prevalence of mature street trees and/or site landscaping combined with one and two story structures may substantially limit or screen distant views (for example, see Figures A6, A12, A15, and A16).

In addition to those resources of local interest identified in the VRA, one (1) notable resource, Lake Erie, is located beyond the five-mile study area. Based on field investigation of the shoreline area

north of the Village of Silver Creek (within 7.5 miles of the Project), visibility along the shoreline is anticipated to be minimal due to screening caused by vegetation and structures. The potential for Project visibility is anticipated to increase the further the viewer is from the shore. Although a clear line of sight to the Project is a potential, visibility will be further reduced by such factors as distance, atmospheric conditions, and viewer activities.

## Character of View

Within the study area typical views, outside developed communities, are characterized by a patchwork of working farms, old fields and forest on a landscape of rolling hills. Built structures consist primarily of low-density permanent homes and manufactured housing, along with accessory structures (barns, garages, sheds, etc.). Development density within the study area is variable, ranging from large, open lots set back from nearby roadways and neighboring properties, to neighborhood clusters of mid-20$^{th}$ century homes or Victorian style homes of varying quality, vintage and size in the more populated villages. Mobile home communities are present within the study area as well. Overall, the structures are of varying vintage and quality.

As shown in the simulations, the introduction of large, clearly man-made structures creates a visible disruption of the landscape. The prominent hills and forests in the study area should be effective sources of minimizing the visual impact of the wind turbines (for example, see Figure A12). This should be true in terms of how visible each turbine will be individually from any given point in the study area and how many turbines can be viewed from any one point in the study area. However, in more level areas, the proposed turbines will be the tallest visible elements within view and will be disproportionate to other elements in the immediate landscape (for example, see Figures A3 and A7). Given the rolling hills in the study area, distribution of turbines across an extended area will result in a minimization of having an overwhelmingly disproportionate amount of turbines visible from any single point (for example, see Figures A6, A12, and A15). The moderately paced sweeping rotation of the turbine blades will heighten the conspicuity of the turbines no matter the degree of visibility.

## Affected Viewers

The Towns of Hanover, Villenova, Perrysburg, Sheridan, Dayton, Charlotte, Cherry Creek, Leon, and Arkwright are each quite rural and have small populations. The population of the Town of Villenova is only 1,121 while the population of the Town of Hanover is 7,638. These towns have a population density of 31 and 155 persons per square mile, respectively. This compares with a population density of 132 persons per square mile for Chautauqua County, and 402 persons per square mile for New York State as a whole.

With the exception of a small section of I-90 within the study area, highways are generally lightly traveled. The small stretch of I-90 that goes through the study area has the highest average annual daily traffic (AADT) volume of any roads in the study area (25,336 vehicles per day). Aside from I-90, the most heavily traveled stretch of road that lies entirely within the study area is a section of NYS Route 39, located between US Route 20 (outside the five-mile study area) and County Route 41. This section of NYS Route 60 receives an average of 2,923 vehicles per day. While the proposed Project will frequently be visible to local residents and travelers, the total number of potentially affected

permanent year-round viewers within the study area is relatively small when compared to other regions of New York State.

The impact to those residents and tourists recreating in the study area will vary. The sensitivity of individuals to visual quality is variable; but to many, visual quality is an important and integral part of their outdoor experience. The presence of wind turbines may diminish the aesthetic experience for those that believe that the rural landscape should be preserved for agricultural, rural residential, open space and similar uses. Such viewers will likely have high sensitivity to the visual quality and landscape character, regardless of the frequency of duration of their exposure to the proposed Project.

Viewshed and field analysis determined that the Project would be visible from locations including the Overland Trail, Tri-County Country Club, Boutwell Hill State Forest (perimeter of property) and the Canadaway Creek WMA (perimeter of property). Hunters and snowmobile riders on private lands will most likely view turbines across open agricultural fields. However, hunters and snowmobile riders may view the turbines in close proximity.

### Other Project Components

During construction of the proposed Project, the use of large mobile cranes, as well as other large construction vehicles (e.g. semi-trucks) and equipment will be noticeable throughout the Project area. It is anticipated that the construction period will be relatively short; therefore the potential visual impacts will be brief and are not expected to result in prolonged adverse visual impact to area residents or visitors. The proposed operations and maintenance building will be located in the Town of Hanover and is a relatively minor component of the Project. It is anticipated that it will be visible by local residents or passers-by.

Access roadways to each turbine will be constructed in order for personnel to perform maintenance. These roadways will be similar in characteristic to farm driveways/roads and the driveways that lead to existing gas wells. These are relatively minor components of the Project and it is anticipated that they will not be highly visible, or seen as being out of place, by local residents or passer-bys.

While red flashing aviation obstruction lighting on communications towers are commonly visible nighttime elements almost everywhere, the concentration of lights within the turbine area would be somewhat unique. While aviation obstruction lighting is generally directed upward, relatively low intensity and will not create atmospheric illumination (sky glow), 34 red lights flashing in unison at close range or in the distance from any given location will be conspicuous and somewhat discordant with the current dark nighttime conditions. Local residents outdoors in the rural nighttime setting will likely be more affected by this condition than would motorists traveling thorough the area after dark.

A preliminary lighting plan, following FAA regulations, was developed for use in completing a viewshed map. The viewshed map clearly indicates that one or more of the 34 proposed lights will theoretically be visible from approximately 25 percent of the five-mile study area. The magnitude of this impact will depend on how many lighted turbines are visible at a specific location and existing ambient lighting conditions present within the view. Local residents quietly enjoying the rural nighttime setting will likely be more affected by this condition than would motorists traveling

thorough the area after dark. These are federally mandated safety features and cannot be omitted of reduced. Daytime lighting of the turbines is not required.

### Shadow Flicker

Based on Table 8 and Figures 5 and 6, of the 157 studied shadow receptors located within 900 meters of the proposed turbines:

- 37 (23.6%) will theoretically be impacted 0-2 hrs/yr;
- 63 (40.1%) will theoretically be impacted 2-10 hrs/yr;
- 30 (19.1%) will theoretically be impacted 10-20 hrs/yr;
- 16 (10.2%) will theoretically be impacted 20-30 hrs/yr;
- 4 (2.5%) will theoretically be impacted 30-40 hrs/yr; and
- 7 (4.5%) will theoretically be impacted 40+ hrs/yr.

Of the eleven receptors that exceed 30 hours of shadow, six (6) are landowners participating in the project. The remaining five (5) receptors that will theoretically be impacted more than 30 hours per year and have views of the Project are receptors 103, 143, 184, 189, and 205. For these receptors, potential mitigation (e.g. window shades) should be evaluated on a case-by-case basis.

There are no regulations or guidelines that establish an acceptable degree of shadow-flicker impact on a potential receptor. Based on the limited number of hours any structure will be impacted, shadow flicker is not expected to create an adverse impact on most nearby residential dwellings. For residences where shadow flicker is greatest, this impact might be considered an annoyance by some, and unnoticed by others.

### Cumulative Impact

With the introduction of both the proposed Noble Ball Hill Windpark and New Grange Wind Farm, one or more structures will be theoretically visible from approximately 35 percent of the five-mile radius study area. The total cumulative visibility of the proposed wind projects is approximately 35,231 acres. When compared to the viewshed completed for the Noble Ball Hill Windpark this is an increase of 6,026 acres. Overall, the cumulative impact appears to be relatively minor as the increased visibility is approximately 6% of the total acreage of the study area.

The introduction of additional turbines within the same viewshed will increase the number of structures visible from most affected vantage points – thus creating a potential higher density of visible structures. However, visibility of both projects is dependent on viewer location/orientation, distance, and other factors discussed in the VRA (Section 3.3). It is possible that with the additional turbines, the cumulative impact may be minimal (for example, see Figures B2 and B3).

### 115 kV Transmission Line

Visibility is most common from properties adjacent or in close proximity to the proposed transmission line, as well as areas to the north, east, and west. Visibility will also be evident from agricultural uplands with cleared lands and down slope vistas in the direction of the proposed transmission line.

Open views of the proposed transmission line will be available from many roadways where roadside vegetation is lacking. These roadways would include, but are not limited to, the NYS Thruway (I-90), Hanover Road, County Route 89, Bennett State Road, and King Road. Many of these views may be fleeting as viewers pass in vehicles, short in duration, or in the context of other transmission structures.

Proposed transmission structures will be located in close proximity and on both sides of these roadways (for example, see Figure C4). Viewers within close proximity to the proposed transmission line will also notice that structures will frequently appear and disappear behind intervening foreground landform and vegetation as they move about the study area. Along some potions of the route, vegetation will need to be cleared (for example, see Figure C5). The clearing will be more noticeable in close proximity and along ridge tops.

Similarly to the turbines, the factors outlined in Section 3.3 (landscape unit, viewer group, distance zone and duration/frequency/circumstances of view), will have an affect on the structures visibility.

### Visual Impact Conclusion

The U.S. Department of Energy and New York State Public Service Commission have mandated that renewable energy sources, such as wind turbines, will provide an increasing percentage of the nation's electricity in the coming years. Meaningful development of renewable wind energy will reduce the reliance on fossil fuel combustion and nuclear fission facilities and result in reduction in air pollutants and greenhouse gasses. This Project is proposed to meet, in small part, this ambitious federal and state objective to provide an environmentally friendly and renewable energy source to help meet the growing energy needs for New York State residents and business.

By their very nature, modern wind energy projects are large and highly visible facilities. The need to position these tall moving structures in highly visible locations cannot be readily avoided. The siting of wind turbines within a rural agricultural area provides increased opportunity for potentially discordant views both near and far. While the use of mitigation techniques will help to minimize adverse visual impact, the construction of the Project will be an undeniable visual presence on the landscape. However, unlike development projects such as housing complexes and commercial centers, the proposed wind energy facility can and will be decommissioned and removed at the end of its useful working life. All of the towers will be removed and the Project area restored as close to its present condition as possible, thus restoring the landscape to its original condition.

## Glossary[20]

**Aesthetic impact**: Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Mere visibility, even startling visibility of a project proposal, should not be a threshold for decision-making. Instead a project, by virtue of its visibility, must clearly interfere with or reduce the public's enjoyment and/or appreciation of the appearance of an inventoried resource (e.g. cooling tower plume blocks a view from a State Park overlook).

**Aesthetically significant place**: A formally designated place visited by recreationists and others for the express purpose of enjoying its beauty. For example, millions of people visit Niagara Falls on an annual basis. They come from around the country and even from around the world. By these measurements, one can make the case that Niagara Falls (a designated State Park) is an aesthetic resource of national significance. Similarly, a resource that is visited by large numbers who come from across the state probably has statewide significance. A place visited primarily by people whose place of origin is local generally is generally of local significance. Unvisited places either have no significance or are "no trespass" places.

**Aesthetic Quality**: There is a difference between the quality of a resource and its significance level. The quality of the resource has to do with its component parts and their arrangement. The arrangement of the component parts is referred to as composition. The quality of the resource and the significance level are generally, though not always, correlated.

**Atmospheric perspective**: Even on the clearest of days, the sky is not entirely transparent because of the presence of atmospheric particulate matter. The light scattering effect of these particles causes atmospheric or aerial perspective, the second important form of perspective. In this form of perspective there is a reduction in the intensity of colors and the contrast between light and dark as the distance of objects from the observer increases. Contrast depends upon the position of the sun and the reflectance of the object, among other items. The net effect is that objects appear "washed out" over great distances.

**Control Points**: The two end points of a line-of-sight. One end is always the elevation of an observer's eyes at a place of interest (e.g. a high point in a State Park) and the other end is always an elevation of a project component of interest (e.g. top of a stack of a combustion facility or the finished grade of a landfill).

**Line-of-sight profile**: A profile is a graphic depiction of the depressions and elevations one would encounter walking along a straight path between two selected locations. A straight line depicting the path of light received by the eye of an imaginary viewer standing on the path and looking towards a predetermined spot along that path constitutes a line-of-sight. The locations along the path where the viewer stands and looks are the control points of the line-of-sight profile.

**Scientific Perspective**: Scientific, linear, or size perspective is the reduction in the apparent size of objects as the distance from the observer increases. An object appears smaller and smaller as an observer moves further and further from it. At some distance, depending upon the size and degree of contrast between the object and its surroundings, the object may not be a point of interest for most people. At this hypothetical distance it can be argued that the object has little impact on the composition of the landscape of which it is a tiny part. Eventually, at even greater distances, the human eye is incapable of seeing the object at all.

**Viewshed**: A map that shows the geographic area from which a proposed action may be seen is a viewshed.

[20] NYSDEC Visual Policy (2000) pp. 9-11.

**Visual Assessments**: Analytical techniques that employ viewsheds, and/or line-of-sight profiles, and descriptions of aesthetic resources, to determine the impact of development upon aesthetic resources; and potential mitigation strategies to avoid, eliminate or reduce impacts on those resources.

**Visual impact:** Visual impact occurs when the mitigating effects of perspective do not reduce the visibility of an object to insignificant levels. Beauty plays no role in this concept. A visual impact may also be considered in the context of contrast. For instance, all other things being equal, a blue object seen against an orange background has greater visual impact than a blue object seen against the same colored blue background. Again, beauty plays no role in this concept.

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Appendix A

# Viewsheds and Photographic Simulations

# 7.5 - MILE VEGETATED VIEWSHED*

## Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure A1
September 2008

KEY

- Proposed Wind Turbine
- Sensitive Resource
- Earl Cardot Eastside Overland Trail
- Snowmobile Trail
- Water Body
- County Boundary
- Municipal Boundary
- Cattaraugus Indian Reservation
- State Forest
- Wildlife Management Area

Number of Turbines Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 60

PROJECT # 2007 - 07097.10M

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# VEGETATED VIEWSHED* AND PHOTO LOCATIONS

## Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure A2
September 2008

KEY

- ① Proposed Wind Turbine
- 1 Sensitive Resource
- Earl Cardot Eastside Overland Trail
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Cattaraugus Indian Reservation
- Water Body
- State Forest
- Wildlife Management Area
- Approximate Photo Angle

Number of Turbines Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 60

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Existing Condition

**FIGURE A3-a**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A3-b**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

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Existing Condition

**FIGURE A3-c**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A3-d**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A3-e**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

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Photo Simulation

**FIGURE A3-f**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A3-g**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A3-h**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition



Photo Simulation

**FIGURE A3-i**

Photo Simulation
VP#2—Prospect Road (looking northeast to southeast)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Existing Condition

**FIGURE A3-j**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A3-k**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A3-I**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A3-m**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A3-n**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A3-o**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

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Existing Condition







Photo Simulation

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**FIGURE A3-p**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine



Existing Condition

**FIGURE A4-a**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine

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Photo Simulation

**FIGURE A4-b**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A4-c**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine

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Photo Simulation

**FIGURE A4-d**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine

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SARATOGA ASSOCIATES



Existing Condition

**FIGURE A4-e**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A4-f**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine

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Existing Condition







Photo Simulation

Noble ENVIRONMENTAL POWER

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**FIGURE A4-g**

Photo Simulation
VP#3.1—Flucker Hill Road
Town of Villenova
Approximately 1.7 miles from the nearest turbine



Existing Condition

**FIGURE A5-a**

Photo Simulation
VP#6.1—County Route 93
Town of Hanover
Approximately 0.5 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A5-b**

Photo Simulation
VP#6.1—County Route 93
Town of Hanover
Approximately 0.5 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A5-c**

Photo Simulation
VP#6.1—County Route 93
Town of Hanover
Approximately 0.5 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A5-d**

Photo Simulation
VP#6.1—County Route 93
Town of Hanover
Approximately 0.5 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES





Existing Condition





Photo Simulation

**FIGURE A5-e**

Photo Simulation
VP#6.1—County Route 93
Town of Hanover
Approximately 0.5 miles from the nearest turbine




Existing Condition

**FIGURE A6-a**

Photo Simulation
VP#7—Tri-County Country Club
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A6-b**

Photo Simulation
VP#7—Tri-County Country Club
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A7-a**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A7-b**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A7-c**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A7-d**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A7-e**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A7-f**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES







Existing Condition







Photo Simulation

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES

**FIGURE A7-g**

Photo Simulation
VP#8—NYS Route 39
Town of Hanover
Approximately 0.3 miles from the nearest turbine



Existing Condition

**FIGURE A8-a**

Photo Simulation
VP#13—NYS Thruway (I-90)
Town of Hanover
Approximately 4.9 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A8-b**

Photo Simulation
VP#13—NYS Thruway (I-90)
Town of Hanover
Approximately 4.9 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A9-a**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A9-b**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A9-c**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES

Visual Resource Assessment
September 2008



Photo Simulation

**FIGURE A9-d**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES





Existing Condition





Photo Simulation

**FIGURE A9-e**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine



Existing Condition

**FIGURE A10-a**

Photo Simulation
VP#36—Boutwell Hill State Forest and Overland Trail
Town of Arkwright
Approximately 3.6 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A10-b**

Photo Simulation
VP#36—Boutwell Hill State Forest and Overland Trail
Town of Arkwright
Approximately 3.6 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A11-a**

Photo Simulation
VP#38—Canadaway Creek WMA
Town of Arkwright
Approximately 2.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A11-b**

Photo Simulation
VP#38—Canadaway Creek WMA
Town of Arkwright
Approximately 2.3 miles from the nearest turbine?

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A11-c**

Photo Simulation
VP#38—Canadaway Creek WMA
Town of Arkwright
Approximately 2.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A11-d**

Photo Simulation
VP#38—Canadaway Creek WMA
Town of Arkwright
Approximately 2.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES





Existing Condition





Photo Simulation

**FIGURE A11-e**

Photo Simulation
VP#38—Canadaway Creek WMA
Town of Arkwright
Approximately 2.3 miles from the nearest turbine



Existing Condition

**FIGURE A12-a**

Photo Simulation
VP#42—Hamlet of Hamlet
Town of Villenova
Approximately 1.2 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A12-b**

Photo Simulation
VP#42—Hamlet of Hamlet
Town of Villenova
Approximately 1.2 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A13-a**

Photo Simulation
VP#47—NYS Route 322
Town of Villenova
Approximately 1.9 miles from the nearest turbine



Photo Simulation

**FIGURE A13-b**

Photo Simulation
VP#47—NYS Route 322
Town of Villenova
Approximately 1.9 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A13-c**

Photo Simulation
VP#47—NYS Route 322
Town of Villenova
Approximately 1.9 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A13-d**

Photo Simulation
VP#47—NYS Route 322
Town of Villenova
Approximately 1.9 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES





Existing Condition





Photo Simulation

**FIGURE A13-e**

Photo Simulation
VP#47—NYS Route 322
Town of Villenova
Approximately 1.9 miles from the nearest turbine



Existing Condition

**FIGURE A14-a**

Photo Simulation
VP#48—NYS Route 83
Town of Villenova
Approximately 3.0 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Photo Simulation

**FIGURE A14-b**

Photo Simulation
VP#48—NYS Route 83
Town of Villenova
Approximately 3.0 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A15-a**

Photo Simulation
VP#49—Pine Valley Central Schools
Town of Cherry Creek
Approximately 4.0 miles from the nearest turbine



Photo Simulation

**FIGURE A15-b**

Photo Simulation
VP#49—Pine Valley Central Schools
Town of Cherry Creek
Approximately 4.0 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE A16-a**

Photo Simulation
VP#53—Village of South Dayton/Hamlet of Skunks Corner
Village of South Dayton
Approximately 3.2 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE A16-b**

Photo Simulation
VP#53—Village of South Dayton/Hamlet of Skunks Corner
Village of South Dayton
Approximately 3.2 miles from the nearest turbine

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Appendix B

# Cumulative Viewshed and Photographic Simulations

# CUMULATIVE VEGETATED VIEWSHED*

## New Grange Wind Farm and Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure B1
September 2008

KEY

- Proposed Wind Turbine
- Potential Sensitive Resource
- New Grange Wind Turbine
- Earl Cardot Eastside Overland Trail
- Snowmobile Trail
- County Boundary
- Municipal Boundary
- Cattaraugus Indian Reservation
- Water Body
- State Forest
- Wildlife Management Area

Number of Turbines Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 60
- 61 - 90
- 91 - 107
- Approximate Photo Angle

PROJECT # 2007 - 07
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File Location: B:\2007\07097\newgrangeballhillvegvwsdmerge.mxd

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NEW YORK CITY > SARATOGA SPRINGS

Noble ENVIRONMENTAL POWER



Existing Condition

**FIGURE B2-a**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation—Noble Ball Hill Windpark

**FIGURE B2-b**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation—New Grange Wind Farm

**FIGURE B2-c**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine



Photo Simulation—Noble Ball Hill Windpark and New Grange Wind Farm

**FIGURE B2-d**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Existing Condition

**FIGURE B2-e**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

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Photo Simulation—Noble Ball Hill Windpark

**FIGURE B2-f**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation—New Grange Wind Farm

**FIGURE B2-g**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation—Noble Ball Hill Windpark and New Grange Wind Farm

**FIGURE B2-h**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine





Existing Condition





Photo Simulation—Noble Ball Hill Windpark and New Grange Wind Farm

**FIGURE B2-i**

Photo Simulation
VP#2—Prospect Road (looking southeast to west)
Town of Villenova
Approximately 0.3 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Existing Condition

**FIGURE B3-a**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation—Noble Ball Hill Windpark

**FIGURE B3-b**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

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Photo Simulation—New Grange Wind Farm

**FIGURE B3-c**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

Noble ENVIRONMENTAL POWER

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Photo Simulation—Noble Ball Hill Windpark and New Grange Wind Farm

**FIGURE B3-d**

Photo Simulation
VP#33—NYS Route 83
Town of Arkwright
Approximately 2.4 miles from the nearest turbine

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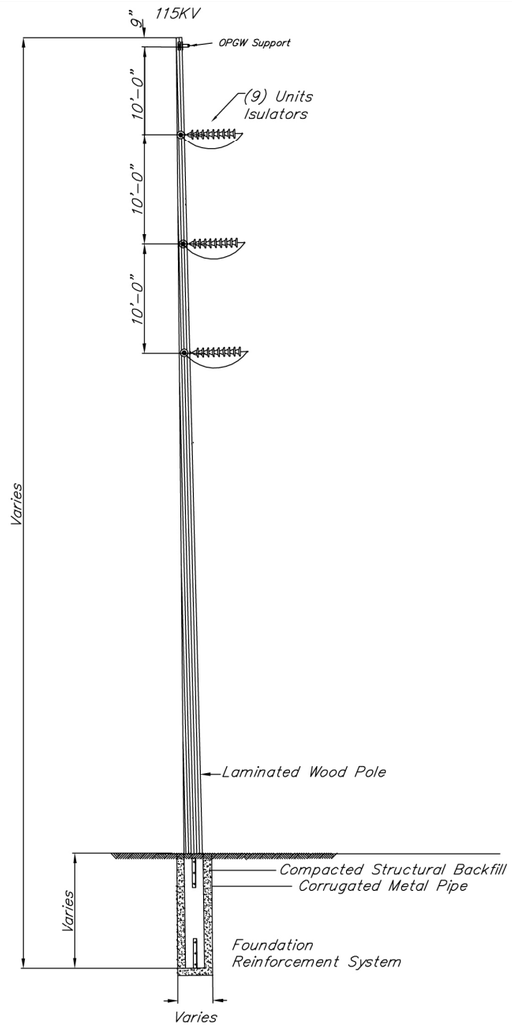
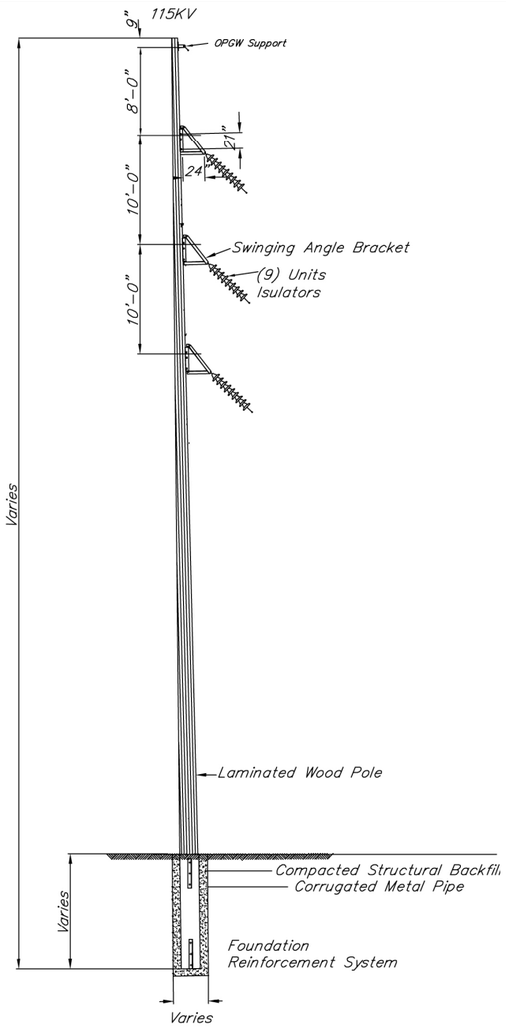
Appendix C

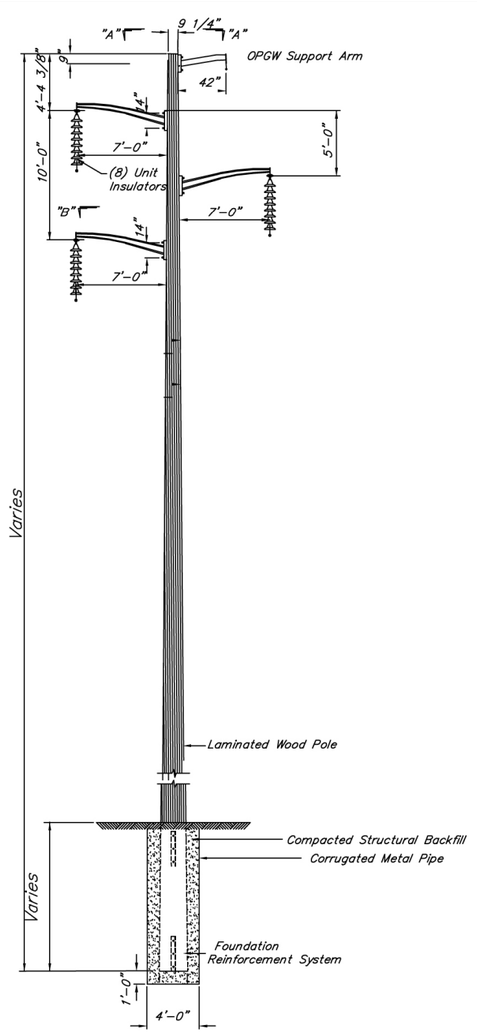
# 115 kV Transmission Line Details, Viewshed and Photographic Simulations




Typical Deadend Structure (Single Circuit)
*Scale: Not to Scale*




Typical Angle Structure (Single Circuit)
*Scale: Not to Scale*




Typical Tangent Structure (Single Circuit)
*Scale: Not to Scale*

Note: Structure details were provided by Careba Power Engineers, PC.

**FIGURE C1**

Details of Proposed Transmission Structures
Town of Hanover

# TRANSMISSION LINE TOPOGRAPHIC VIEWSHED

Noble Ball Hill Windpark

Figure C2
September 2008

KEY

- (1) Proposed Wind Turbine
- Proposed Transmission Structure
- Proposed Transmission Centerline
- Snowmobile Trail
- Municipal Boundary
- County Boundary
- Water Body

Number of Structures Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 73

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# TRANSMISSION LINE VEGETATED VIEWSHED*

## Noble Ball Hill Windpark

*Assumes 40 foot (12.192 m) vegetation height in areas considered forested by the 2001 National Land Cover Dataset

Figure C3
September 2008

KEY

- T1 Viewpoint
- ① Proposed Wind Turbine
- Proposed Transmission Structure
- Proposed Transmission Centerline
- Snowmobile Trail
- Municipal Boundary
- County Boundary
- Water Body
- Photo Angle

Number of Structures Visible

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 35
- 36 - 50
- 51 - 73

PROJECT # 2007 - 07097.10M

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Existing Condition

**FIGURE C4-a**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE C4-b**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Existing Condition

**FIGURE C4-c**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE C4-d**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE C4-e**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Photo Simulation

## FIGURE C4-f

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

SARATOGA ASSOCIATES



Existing Condition

**FIGURE C4-g**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE C4-h**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Existing Condition



Photo Simulation

**FIGURE C4-i**

Photo Simulation
VP#T1—NYS Route 39
Town of Hanover
Approximately 360 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Existing Condition

**FIGURE C5-a**

Photo Simulation
VP#T2—King Road
Town of Hanover
Approximately 180 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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Photo Simulation

**FIGURE C5-b**

Photo Simulation
VP#T2—King Road
Town of Hanover
Approximately 180 feet from the nearest transmission structure

Noble ENVIRONMENTAL POWER

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