



WELCOME

This is a Public Open House for the Broad Mountain Wind Project, where project staff are available to answer any questions and receive input from attendees. We have prepared a series of boards that outline the Broad Mountain Wind Project. Please feel free to ask questions and fill out our survey.

BEFORE YOU LEAVE

Please register and complete our comment form, or send it by mail or email to:

Email: BroadMountainWindProject@libertyutilities.com

Postal Address: 354 Davis Road, Oakville, Ontario Canada L6J 2X1

Phone Number: 1 (833) 250-4587

Website: www.broadmountainwindproject.com

To learn more about the Project, please visit our website or contact us.





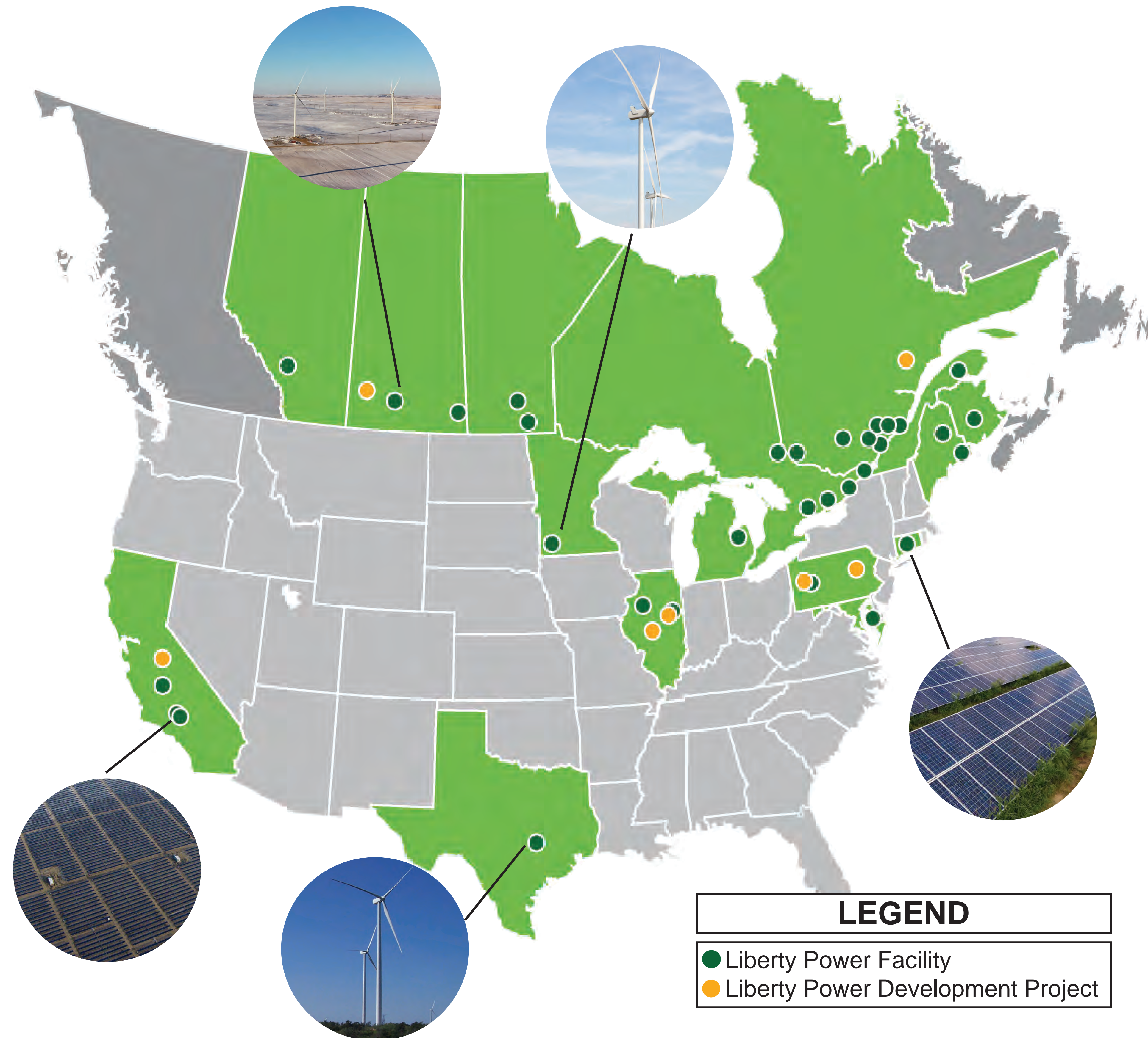
COMPANY HISTORY

Algonquin Power & Utilities Corp. (Algonquin) was established in 1998 as a developer of small hydro projects in Ontario.

Algonquin publicly listed as a common share on the Toronto Stock Exchange in 1997, with interests in 17 hydroelectric facilities in Ontario, Quebec, New York, and New Hampshire with total assets of \$78 million. In 2016, Algonquin was publicly listed as a common share on the New York Stock Exchange.

Since then, Algonquin has expanded into the utility business through Liberty Utilities, and has become a market leader in renewable generation from wind and solar assets in North America through Liberty Power.

Liberty now has over \$10 billion in assets and a generation portfolio of approximately 1.7 GW of installed capacity.





PROJECT INFORMATION

PROJECT OWNER

- Broad Mountain Power LLC

PROJECT NAME

- Broad Mountain Wind Project

ACQUIRED

- June 2018 - Ensources & NorthRenew Energy

TOWNSHIP

- Packer Township and Nesquehoning Borough

PROJECT TYPE AND SIZE

- 80 MW Wind Energy Project

WIND TURBINE CAPACITY

- 5 (2.6 MW) Turbines and 16 (4.2 MW) Turbines

PROJECT DURATION

- 20+ years

PROJECT COMPLETION

- Anticipate construction to begin Q4 2019
- In service by Q4 2020.

PROJECT INFRASTRUCTURE

TURBINES

- 21 Turbines

COLLECTION SYSTEM

- 34.5 kV collection system from turbines to substation.

PROJECT SUBSTATION

- Located on Broad Mountain

OPERATIONS AND MAINTENANCE BUILDING

- Location to be Determined

TEMPORARY LAYDOWN YARDS

- Locations to be Determined

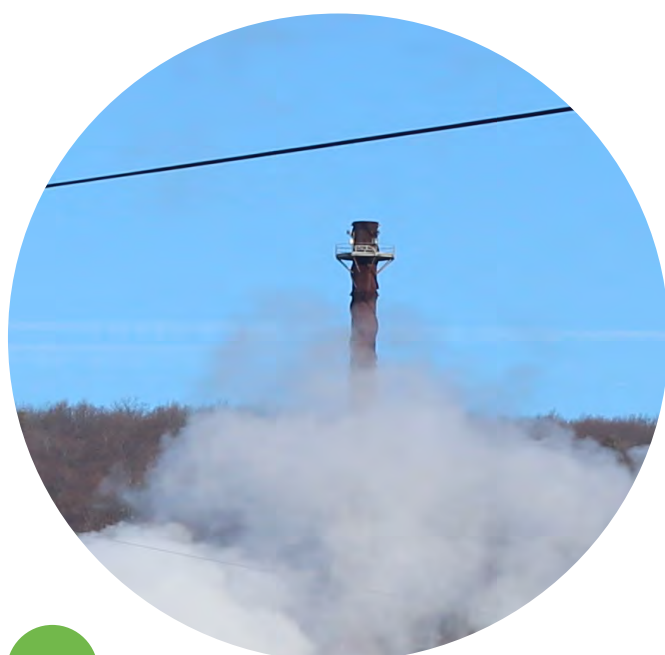
INTERCONNECTION

TRANSMISSION SYSTEM

- 69 kV - From the substation to PPL's line that parallel's the south side of #54, Stock Road.
- The transmission line will be overhead.

POINT OF INTERCONNECTION

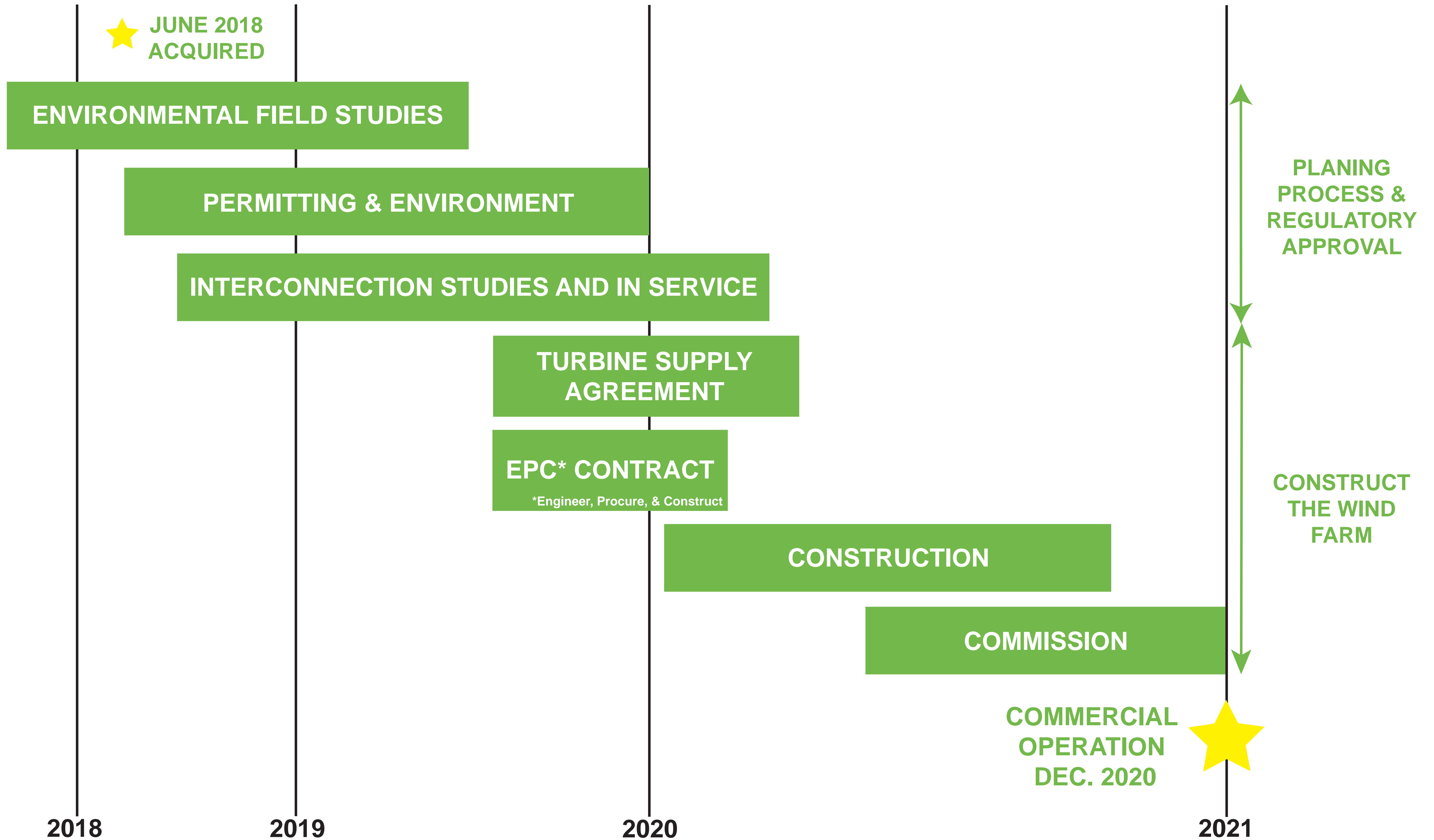
- PPL Siegfried to Hauto Circuits #1 and #4





PROJECT SCHEDULE

FEBRUARY 2019





TOWNSHIP ZONING ORDINANCE

- Property Line Setbacks, turbine height + 50 feet
- A Noise Study and a 50 dBA limit at property lines
- A Visual Assessment
- Approval is conditional upon several 3rd party agency approvals, for example NPDES, FAA, Building Code, etc.

INDUSTRY STANDARDS & PRACTICES

- Best Practices identified by American Wind Energy Association (AWEA), Liberty Power and/or Shoener Environmental

STATE GUIDELINES AND REGULATIONS

- Pennsylvania Game Commission Wind Voluntary Cooperative Agreement
- National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Discharges associated with construction activities.
- Consultation with PA Game Commission, PA Fish and Boat, PA Department of Conservation and Natural Resources.

ARCHEOLOGICAL & HISTORICAL INVESTIGATION

- Tabletop
- Fieldwork

ENVIRONMENTAL SURVEYS & STUDIES

- Conducting avian and bat surveys as per U.S. Fish and Wildlife Wind Turbine Land Base Guidelines.

WIND ANALYSIS

- Speed
- Elevation
- Direction



ENVIRONMENTAL STUDIES

The following Environmental Studies have been utilized in the siting process to avoid potential impacts on wildlife and wildlife habitat.

COMPLETED STUDIES

- Tier 1 and 2 Site Characterization Report
- Wetlands and Waterways Delineation
- Avian and Bat Field Surveys

UPCOMING STUDIES

- Further Avian Surveys

These studies began in the Spring of 2018 and will be completed by November 2019.





ECONOMIC

- 12 months of construction worth. Project cost is approximately \$125 to \$145 million.
- Local labor, equipment and supplies such as road construction, gravel/sand, concrete foundations, electrical work, O&M building, fencing, security, etc.
- Local restaurants, hotels and other services will be patronized during construction.
- At the peak of construction an 80 MW wind farm development is expected to create between 100 to 120 jobs.
- Liberty estimates that between \$12 to \$15 million of the projects' cost will go directing to the local economy.
- It is anticipated that there will be 1 - 2 Full Time permanent employees. Siemens Gamesa will also employ people to maintain and service equipment.
- Opportunities for local contractors to assist with maintenance of the facility (i.e. grounds and roads maintenance).

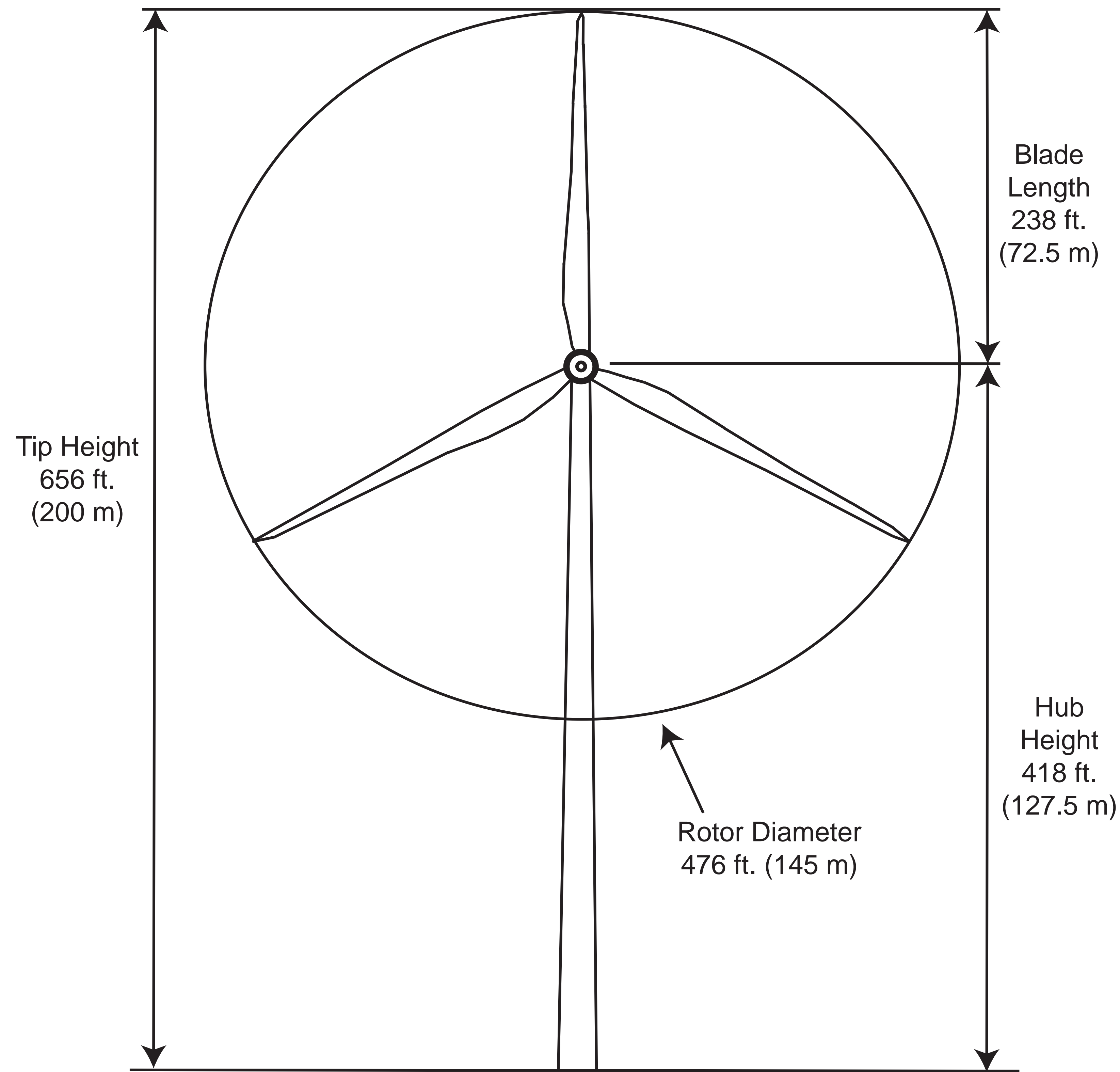
COMMUNITY

- Creates local jobs during development, construction, and operation.
- Provides direct economic benefits through community benefits agreement and property taxes.
- Increases revenue for local businesses both during and after construction.
- On the property, it allows for many compatible land uses, such as recreation and hunting.

ENVIRONMENTAL

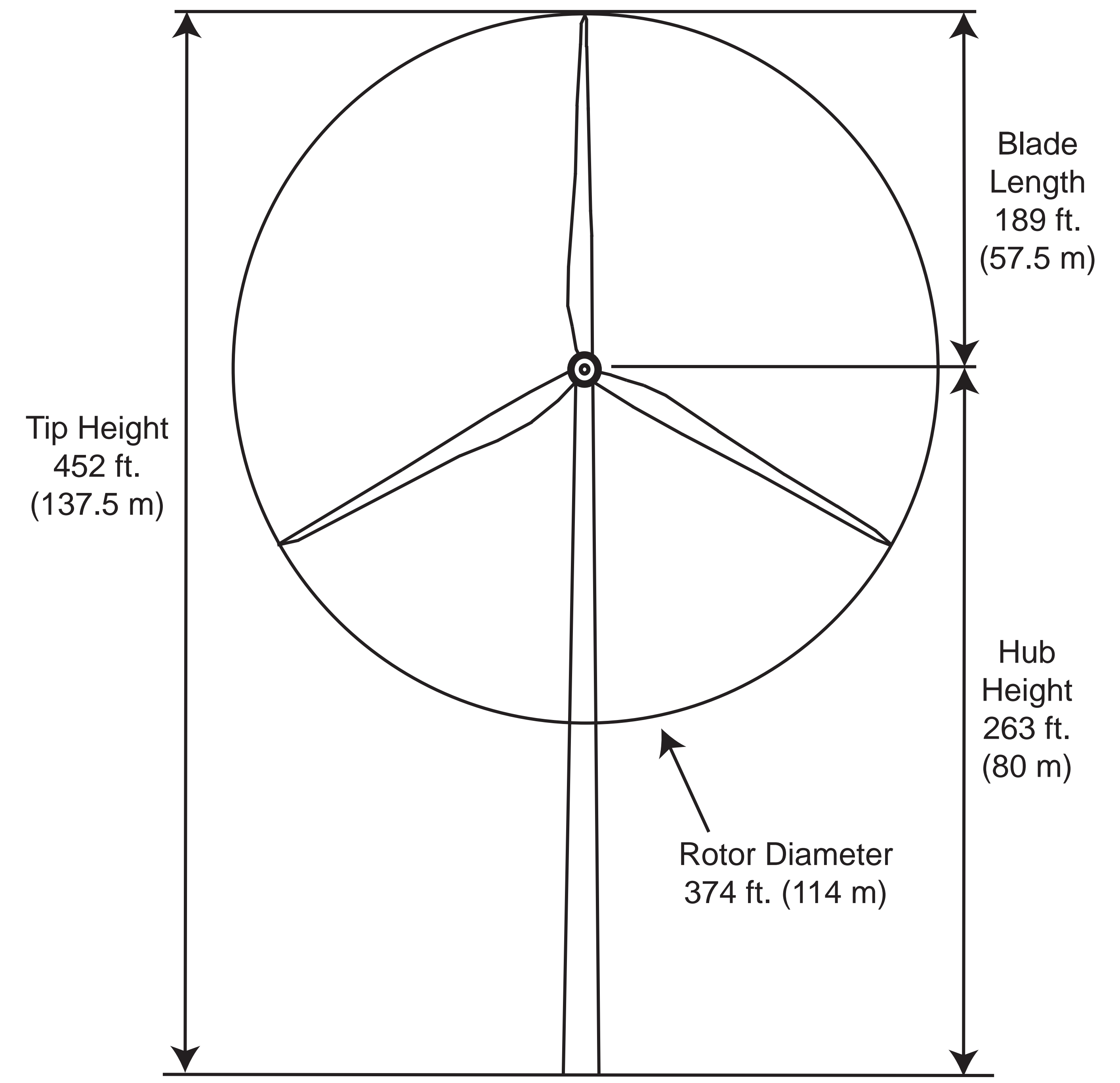
- Wind is an emission free and inexhaustible resource producing low cost renewable energy.
- Wind energy is another domestic energy source.
- Modern wind energy generating equipment is relatively quick to install & requires minimal maintenance once operational.





WIND TURBINE DIMENSIONS

(Dimensions shown are for the SG 4.5-145 with a 127.5m Hub Height)

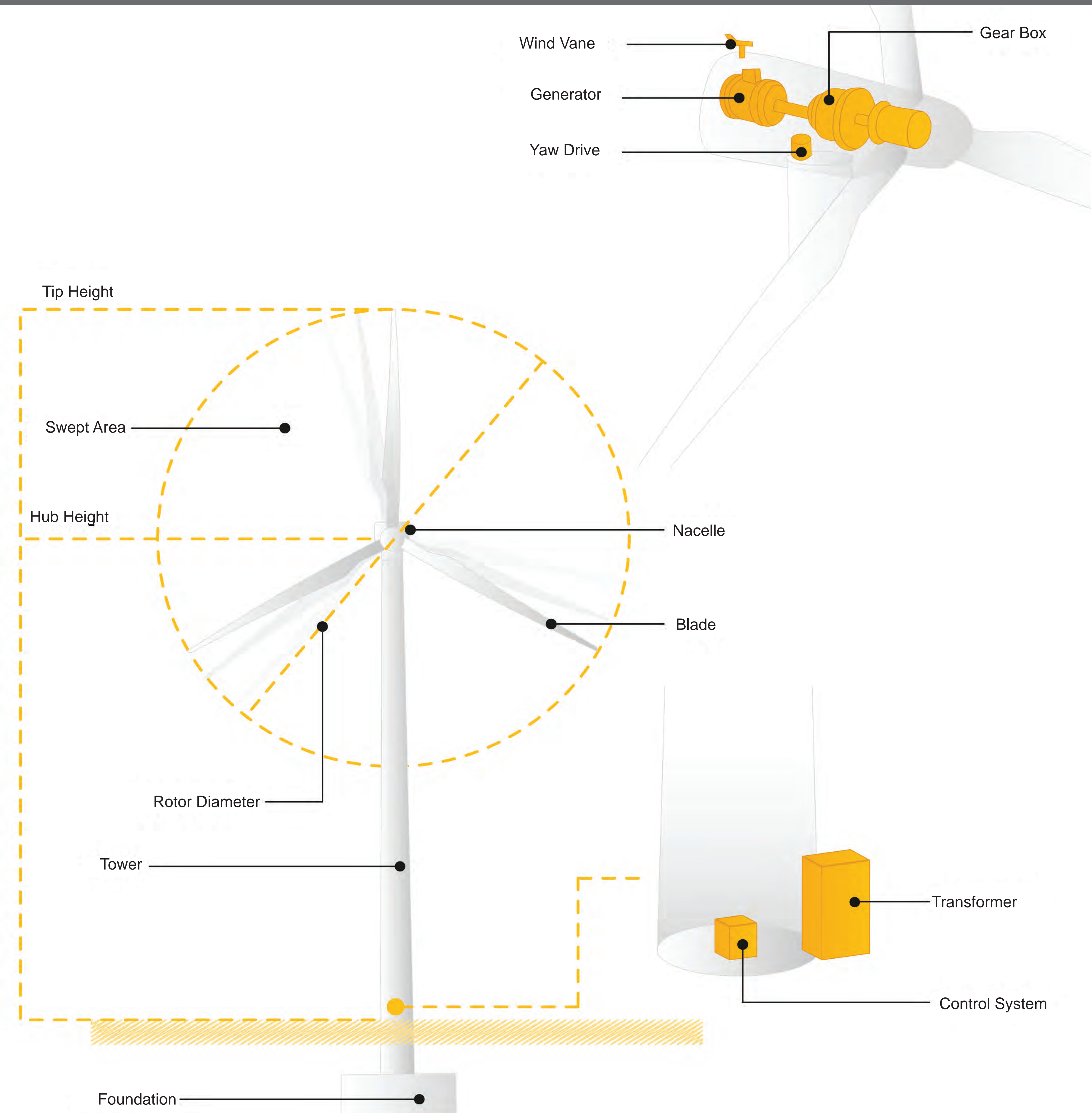


WIND TURBINE DIMENSIONS

(Dimensions shown are for the SG 2.6-114 with a 80 m Hub Height)

HOW IT WORKS

- (1) When the blades start moving, they spin a shaft that leads to a generator.
- (2) The generator consists of a conductor, such as a coiled wire, that is surrounded by magnets.
- (3) The rotating shaft turns the magnets around the conductor and generates an electrical current.
- (4) A wind vane at the top of the turbine causes it to rotate to face into the wind and the blades change their angle to best catch the wind. Sensors and / or an anemometer monitors the wind speed and if it is too strong, the turbine is stopped (Blades “feather” & brakes are applied).
- (5) Kinetic Energy of the wind is converted to Mechanical Energy, which is converted to Electrical Energy.



NOISE (CLAUSE 12 IN ORDINANCE)

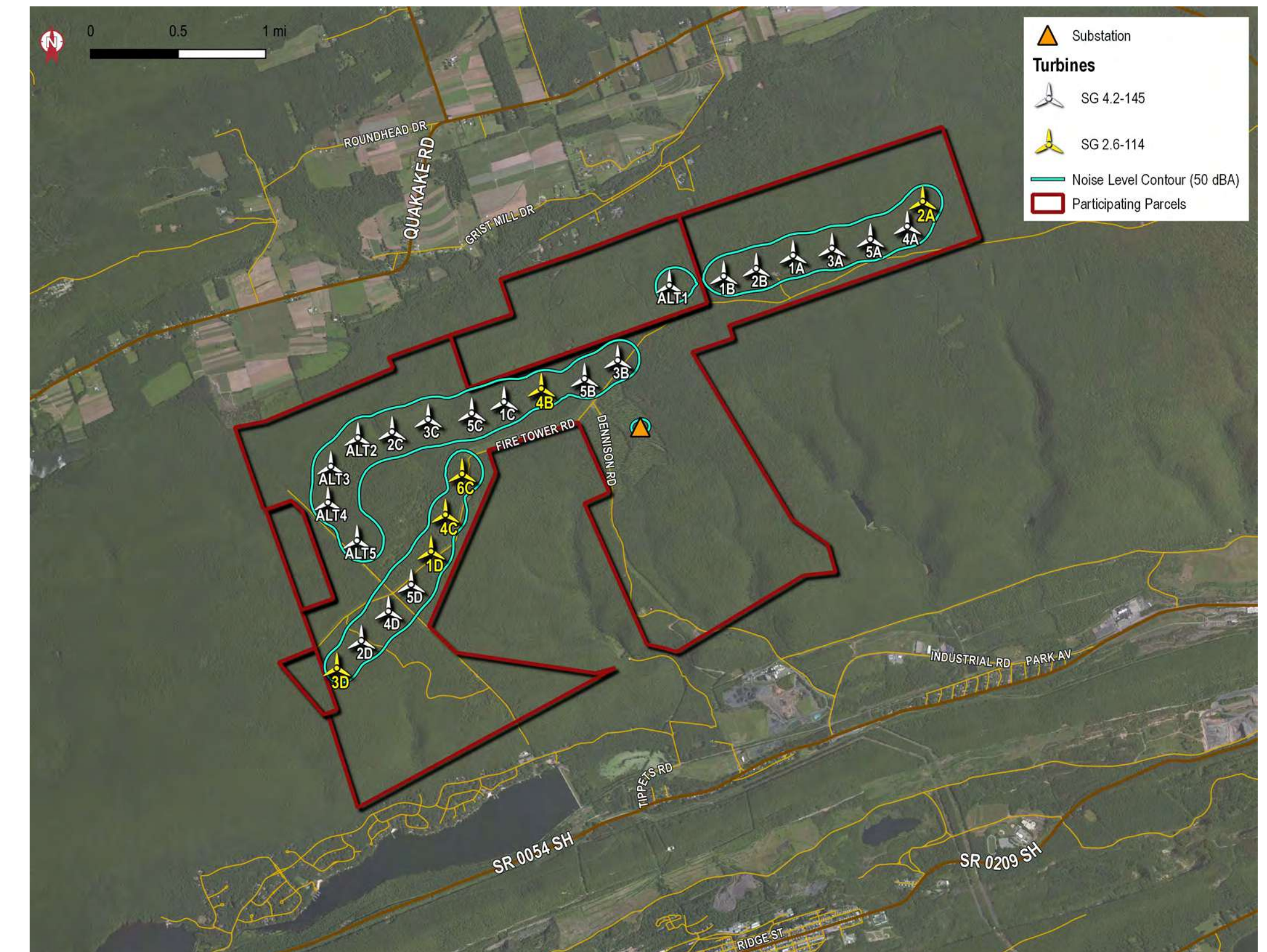
- Limit is 50 dBA (A-weighted) measured at the property line
- Distance is used to mitigate noise or sound level
- Ordinance states that wind mills shall be located no less than 1000 feet from a principal residential structure or occupied non-residential structure. This has been exceeded.

NOISE MITIGATION

- Ensuring all equipment is serviced and operating properly.

NOISE IMPACT ASSESSMENT

- A noise consultant completed a Noise Impact Assessment to ensure project is compliant with wind ordinance.
- Demonstrated that noise at closest homes is under 40 dBA.



JET AIRCRAFT
(140 dBA AT
3.28 ft.)

ROCK CONCERT
(110-130 dBA
AT 3.28 ft.)

**COMPUTER
GAME**
(69 dBA AT 3.28 ft.)

**RESIDENTIAL
AREA**
(35-45 dBA)

**SLEEPING
BEDROOM**
(30 dBA)

**WHISPER
QUIET (20-30
dBA AT 3.28 ft.)**



**POWER
DRILL**
(130 dBA
AT 3.28 ft.)

**FACTORY
MACHINERY**
(100 dBA AT
3.28 ft.)

**AUTOMOBILE
AT 80 KM/HR**
(72 dBA AT
16.4 ft.)

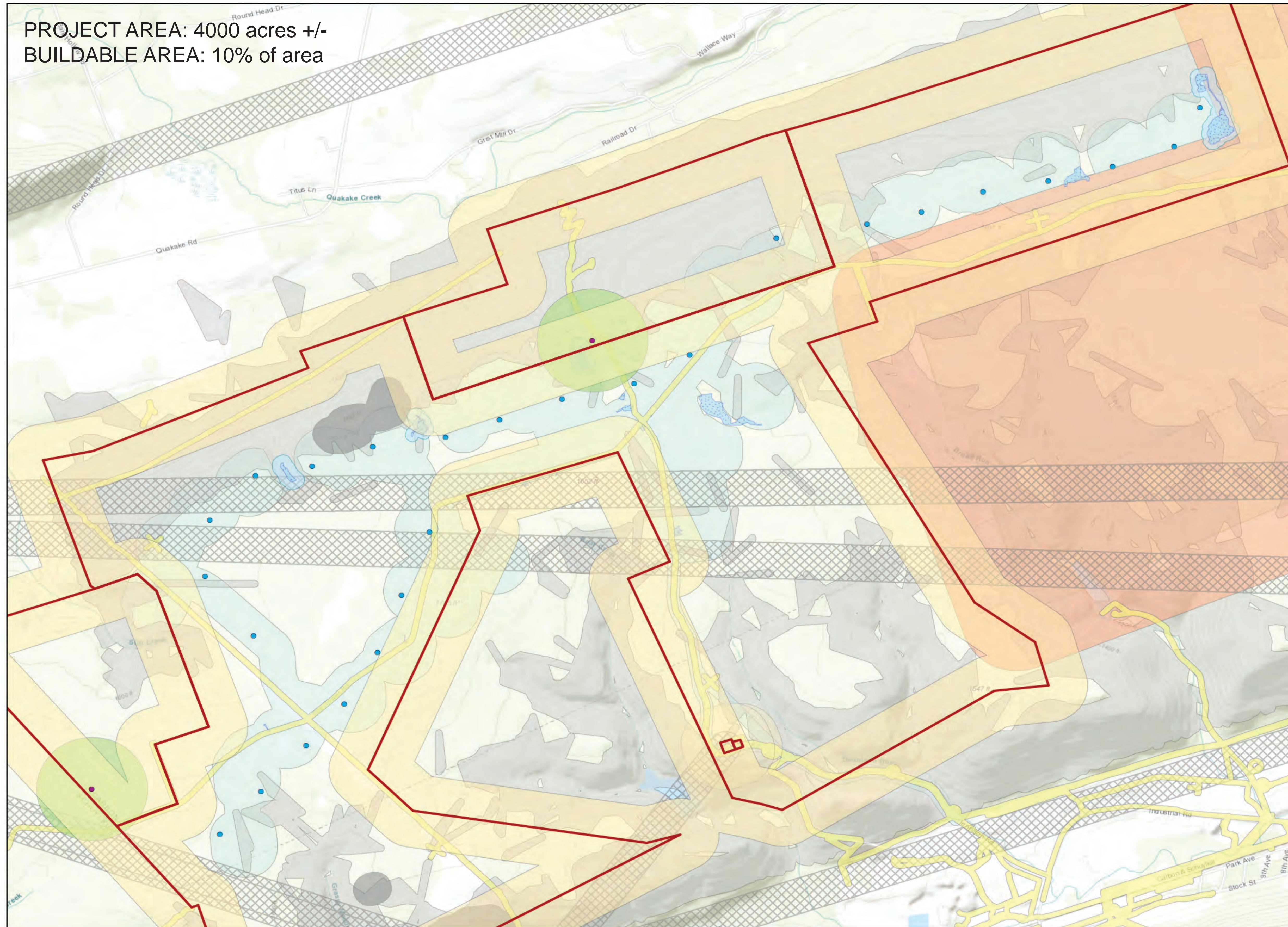
**MAXIMUM ALLOWABLE
WIND TURBINE NOISE
MEASURED AT A
PROPERTY LINE (50 dBA)**

**BLOWING
LEAVES**
(10-15 dBA)



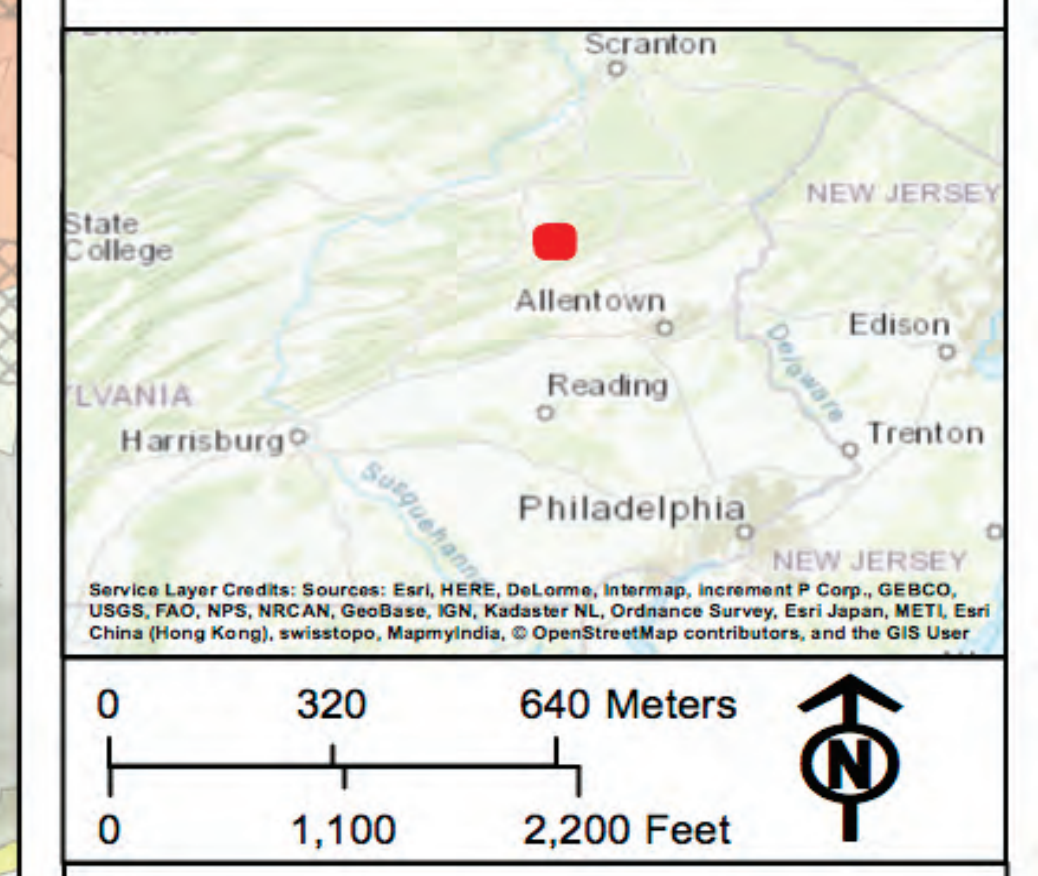
SETBACKS & ENVIRONMENTAL CONSTRAINTS MAP

FEBRUARY 2019



PROJECT AREA: 4000 acres +/-
 BUILDABLE AREA: 10% of area

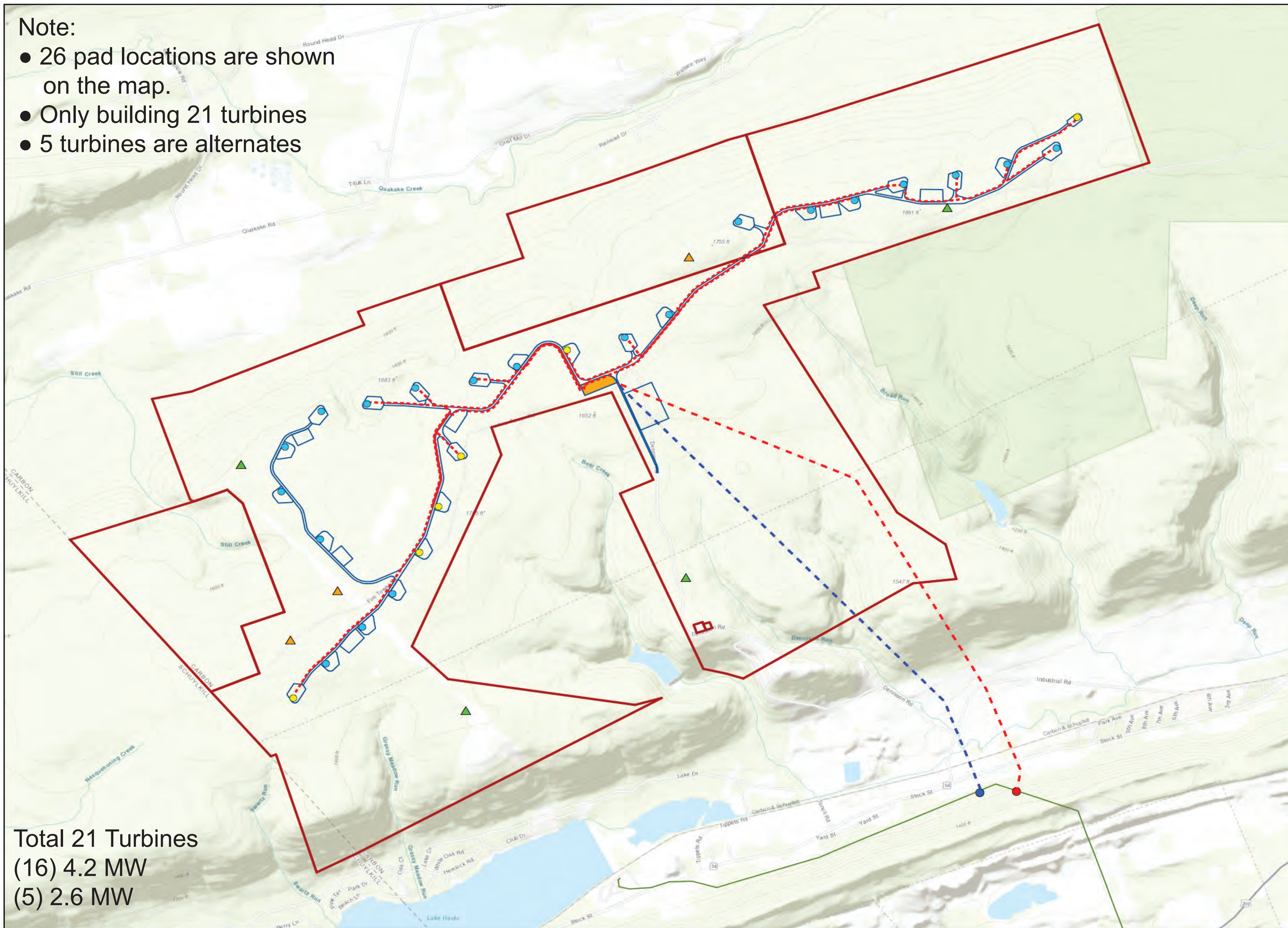
- ### Legend
- Proposed Preliminary Turbines
 - Hunt Camp
 - Participating Property Lines
 - Property Line Setback - 706ft
 - Hunt Camp Setback - 1000ft
 - Easements - 50ft
 - Waterbodies/Wetlands
 - Waterbodies/Wetlands Buffers
 - Environmental Buffer - 300ft
 - Microwave Path - 285ft
 - State Game Land - 1000ft
 - Areas of High Slope - 65ft
 - Wetland Study Area



BROAD MOUNTAIN POWER LLC	
TITLE:	
Turbine Setbacks	
DATUM/PROJECTION: NAD83/UTM 18N	SCALE: 1:20,000
DRAWN BY: D THOMPSON	DATE: FEB 13, 2019
DRAWING No. BROAD - 113	REVISION No. 5

Note:

- 26 pad locations are shown on the map.
- Only building 21 turbines
- 5 turbines are alternates



Total 21 Turbines
 (16) 4.2 MW
 (5) 2.6 MW

Legend

- ▲ Proposed Preliminary MET Tower, 127.5m¹
- ▲ Existing MET Tower, 60m
- Proposed Preliminary Turbines²**
- G114 2.625MW hub: 80.0 m
- SG145 4.2MW hub: 107.5
- Proposed Preliminary Transmission Line**
- - - Option 6
- - - Option 8
- Proposed Preliminary Line Tap**
- Option 6
- Option 8
- - - Proposed Preliminary Collector Line
- Existing Transmission Line
- Proposed Preliminary Access Roads and Laydown
- Participating Property Lines/Leased Boundary
- Proposed Preliminary Substation

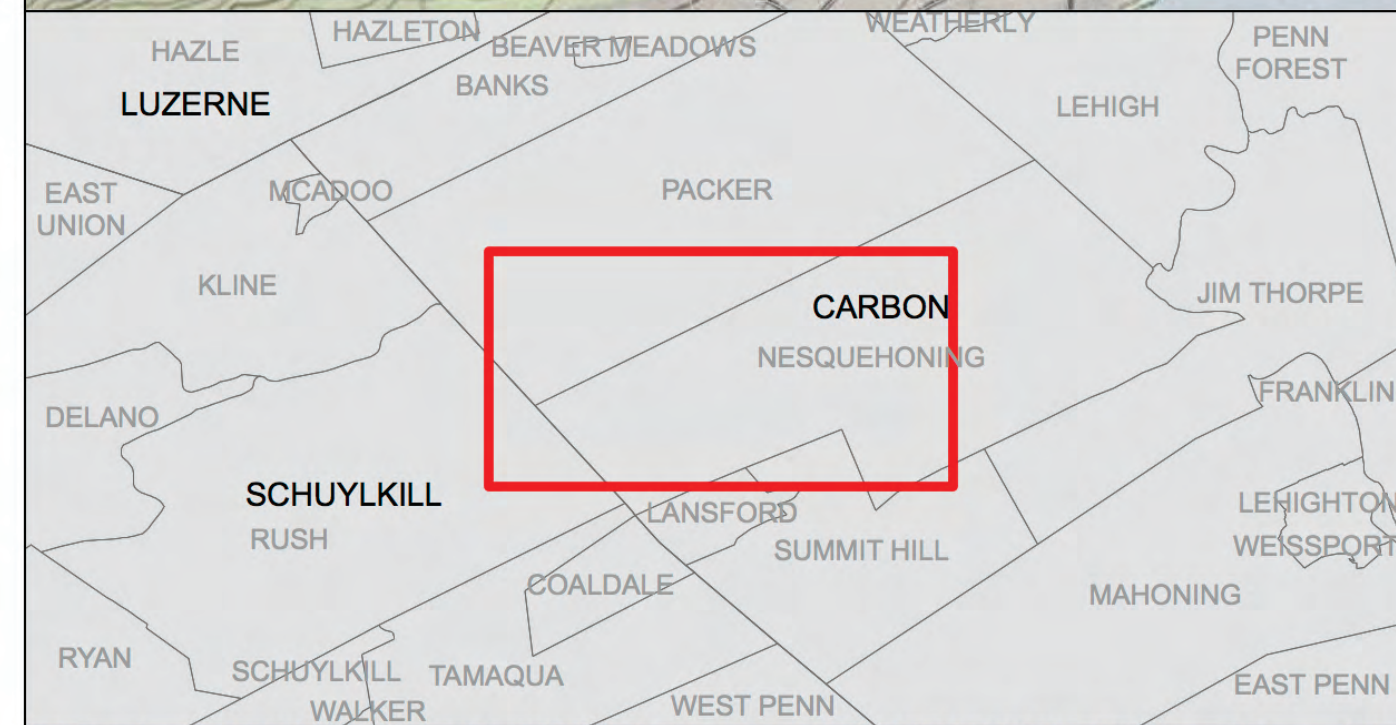
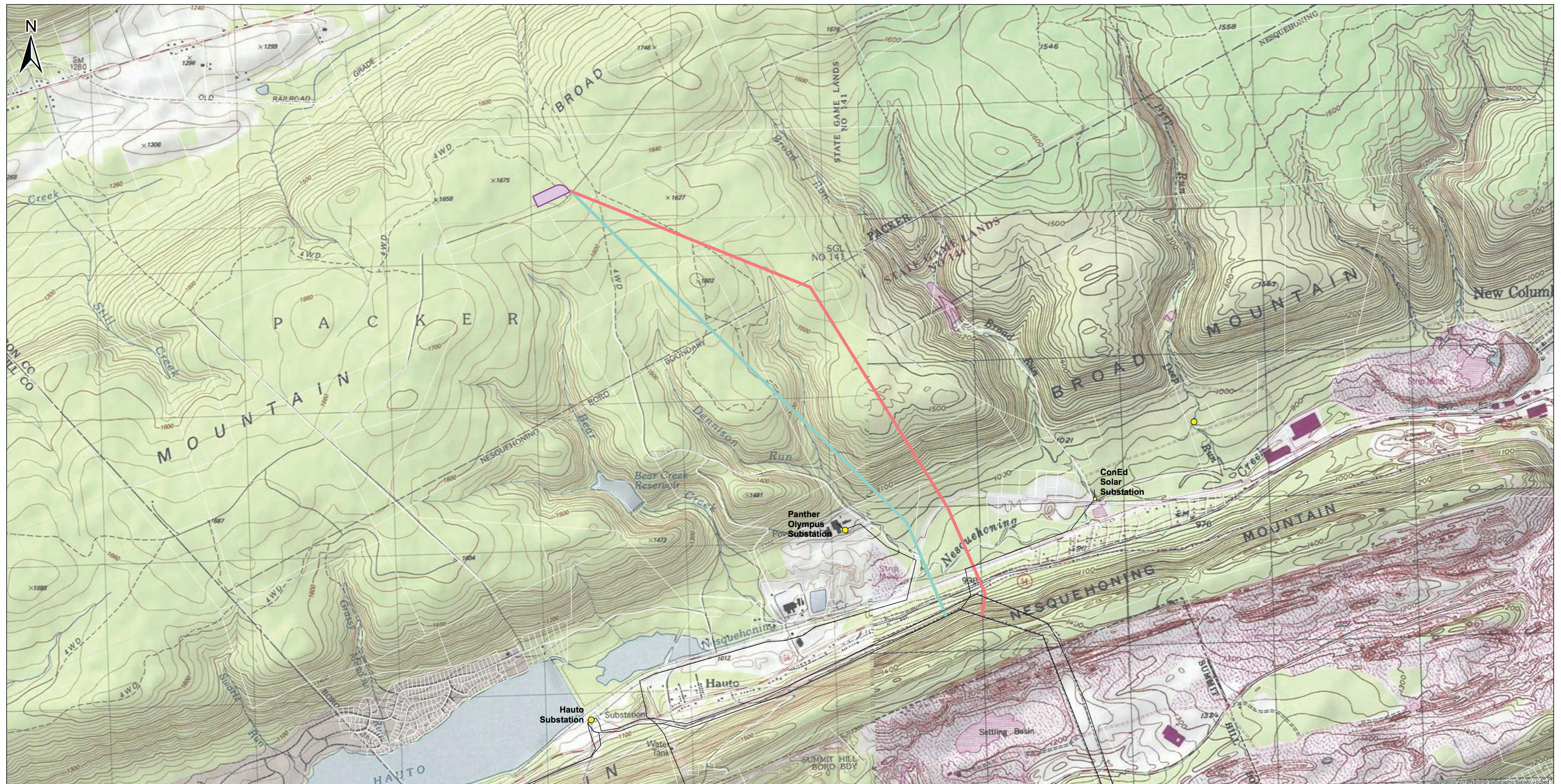
¹: Turbines 3B, 2D, 3D, 5D, 5D, ALT1 & ALT5 are potential locations of a temporary MET tower to be in place prior to construction.
²: This map presents 26 potential pad locations, of which 21 will be built.

0 400 800 Meters
 0 1,375 2,750 Feet

BROAD MOUNTAIN POWER LLC

TITLE:
**General Layout
 80MW**

DATUM/PROJECTION: NAD83/UTM 18N	SCALE: 1:25,000
DRAWN BY: D THOMPSON	DATE: FEB 13, 2019
DRAWING No. BROAD - 100	REVISION No. 19



References
 1. Coordinate System: NAD 1983 StatePlane Pennsylvania North FIPS 3701 Feet
 2. Projection: Lambert Conformal Conic
 3. Data Sources: ESRI, PowerMap, Carbon County

Legend
 — Existing Transmission Lines
 ● Existing Substations
 ■ Proposed Substation_Liberty
 □ County Parcels

Alternative Routes
 — Option 6
 — Option 8

Figure No. _____

**Broad Mountain Wind
Project Study Area Map - Topo**
 Carbon County, Pennsylvania
Liberty Power

Prepared by: HDB Date: 2/13/2019
 Reviewed by: DY/BB Job No.: _____

0 1,000 2,000 4,000 Feet
 1 in = 1,000 feet



**LAND
PREPARATION**



**CONSTRUCTION OF
ACCESS ROADS,
LAYDOWN AND
WORKING AREAS**



**CONSTRUCTION
OF WIND TURBINE
FOUNDATIONS**



**DELIVERY OF
EQUIPMENT**



**ASSEMBLY AND
INSTALLATION OF
WIND TURBINES**



**CONSTRUCTION
OF ELECTRICAL
COLLECTOR SYSTEM,
SUBSTATION AND
INTERCONNECTION
POINT**



**CONSTRUCTION OF
COMMUNICATIONS AND
METEOROLOGICAL
TOWERS**



**SITE CLEAN-UP
AND RECLAMATION**

BEFORE



AFTER



VIEWPOINT:
Nesquehoning
Borough
Looking West

VIEWPOINT:
Wallace Way
Looking
Southwest

VIEWPOINT:
Quakake
Road Looking
South



DISCONTINUED USE

As per Clause 11 of the Wind Ordinance, a Discontinued Use Plan was submitted to Packer Township as part of the Zoning Permit Application. The plan outlines how the land will be remediated after the end of operations. The Plan will be updated prior to the start of any decommissioning, as some standards and practices may change over the life of the project.

TURBINES

- Turbines would be dismantled and taken away.
- Reusable material would be sold or recycled, if possible.

TURBINE FOUNDATIONS

- Turbine foundations would be removed to a depth of 4 feet, so that historic activity where the infrastructure was located can occur afterwards.

LAND

- Impacted land will be restored to a state suitable for the intended future use of the land.

ELECTRICAL INFRASTRUCTURE

- Above ground lines would be removed and disposed.
- Underground lines would be cut, with material removed to 4 feet below grade. Normal activity practices would be able to occur afterwards.
- Transformers would be removed.

ACCESS ROADS

- Would be removed and land returned to similar condition as before the project; in consultation with the landowner.



WHAT STUDIES HAVE BEEN DONE ON PROPERTY VALUES AND WIND FARMS?

Lawrence Berkeley National Laboratory (2013)

- Study analyzed more than 50,000 home sales near 67 wind projects across nine U.S. states.
- Collected data from before and after the announcement of wind farm development and after constructed and operating.
- Did not find any impacts to nearby home property values.

Centre for Economics and Business Research

- Studies published over the last two decades state “wind farms have no negative impact on the prices of property within a 5 km radius of turbines,” based on 82,000 transactions.

Journal of Real Estate Research

- Investigated approximately 7,500 sales of single-family homes surrounding 24 operating U.S. wind facilities.
- Four different hedonic models, and a variety of robustness tests.
- Result: Neither the view of the wind facilities nor the distance of the home to those facilities were found to have statistically significant effect on sales prices.

