Contents

Figures:

Tables:

Appendices:

ACRONYMS LIST

ANSI	American National Standards Institute
ASN	Aeronautical Study Number
BBCS	Bird and Bat Conservation Strategy
BOA	Board of Adjustment
BOS	Board of Supervisors
CUP	Conditional Use Permit
C-WECS	Commercial Wind Energy Conversion System
dB(A)	A-weighted decibels
DNH	Determination of No Hazard
FAA	Federal Aviation Administration
GW	gigawatt
HH	Hub Height
IDNR	Iowa Department of Natural Resources
IDOT	Iowa Department of Transportation
IEEE	Institute of Electrical and Electronics Engineers
IRAC	Interdepartment Radio Advisory Committee
kV	kilovolt
LBNL	Lawrence Berkeley National Laboratory
LLC	Limited Liability Company
m	meters
MET	meteorological
MW	megawatt
mph	miles per hour
NEC	National Electric Code
NEMA	National Electric Manufacturers Association
NESC	National Electric Safety Code

O&M	Operations and Maintenance
RMA	Road Maintenance Agreement
ROW	Right of Way
US	United States
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
WEG	USFWS Land-Based Wind Energy Guidelines

I. Introduction

A. Overview

North English Wind Project, LLC (North English or Applicant) submits this application (Application) for a Commercial Wind Energy Conversion System (C-WECS) Conditional Use Permit (CUP) to Poweshiek County, Iowa (Poweshiek County or County) for the proposed North English Wind Project (Project or North English Wind Project). In accordance with Article XX, Section 5 of the Poweshiek County Zoning Ordinance, as amended in March 2017 (Zoning Ordinance), a completed Poweshiek County Permit Application Form is attached as **Appendix A – Permit Application Form**.

The Application is consistent with the discussion and guidance of the Board of Adjustment at the Pre-Application Review meeting held on March 23, 2017 pursuant to Article XX, Section 5.q of the Zoning Ordinance. In addition, the Application demonstrates compliance with 1) the Zoning Ordinance requirements for C-WECS set forth in Article XX, Section 5 , 2) the purpose and intent of Article IV of the Zoning Ordinance, and 3) Iowa Code Annotated §335.10, which permits the Board of Adjustment to, in appropriate cases and subject to appropriate conditions and safeguards, make special exceptions (i.e., conditional or special uses) in harmony with the general purposes and intent of the ordinance and in accordance with the general or specific requirements of the ordinance.

Wind energy has been successfully utilized throughout Iowa as an alternative method of generating electricity. This Project will provide this opportunity to Poweshiek County. The most important factor driving clean energy's market momentum is price. Wind energy has proved to be not only one of the most effective, readily-available renewable solutions for power production, it also can be the cheapest.[1] Since 2009, the real cost for wind energy in the U.S. has dropped more than 66 percent.[2] Wind is now often cheaper than coal and the other fuels it is replacing. In 2016, Iowa, South Dakota, Kansas, Oklahoma, and North Dakota all sourced more than 20 percent of their annual electricity generation from wind power with Iowa leading the nation at 36.6 percent, according to the U.S. Energy Information Administration.[3] Of the approximate 52,000 wind turbines in the country, more than 4,000 of them are operating in Iowa; producing jobs, economic benefits to the counties where they are located, and clean energy.[4]

The Project is located in Deep River, Jackson, Lincoln, Malcom, Pleasant, Scott, and Union Townships, Poweshiek County, Iowa. The Project Area represents approximately 50,226 acres of ground or property as shown on the map in **Figure 1 - Project Area**.

[1] American Wind Energy Association, 2016. http://www.awea.org/falling-wind-energy-costs
[2] American Wind Energy Association, 2016. http://www.awea.org/MediaCenter/pressrelease.aspx?ItemNumber=8993
[3] United States Energy Information Association. https://www.eia.gov/state/
[4] Iowa Wind Energy Association, 2017. http://www.iowawindenergy.info/wind-day-on-the-hill/

Within the Project Area, there are approximately 39,619 acres of ground for which a Lease Agreement evidenced by a Memorandum of Wind Energy Lease (Lease Agreement) or an Authorized Agent Form by a landowner who is either in negotiations to grant a Wind Energy Lease or is anticipated to execute some other land rights agreement (Authorized Agent). For purposes of this Application, properties with executed Lease Agreements or Authorized Agent Forms are considered Participating Properties (Participating Property or Participating Properties). These Participating Properties can be seen on the map in **Figure 2 - Participating Properties** and are listed in Table 1 in **Appendix B – Legal Description and Location of Property**. The Lease Agreements and Authorized Agent Forms are included in **Appendix B – Legal Description and Location of Property**. Of the 39,619 acres of Participating Properties, only approximately 114 acres will be developed with permanent Project facilities (wind turbines and associated facilities as described in Section II.C below). The Project is anticipated to generate up to 340 megawatts (MW) of electricity at rated capacity and will result in the construction of up to 170 wind turbines. Additional permanent Project facilities include, but are not limited to, underground electric and communication lines, transformers, a Project substation, access roads, and associated facilities as needed, as defined in Article 5, Paragraph 90 in the Zoning Ordinance. An operations and maintenance (O&M) building will also be utilized, but is anticipated to be located outside of the Project Area and will be permitted under a separate permitting effort if required. An overview of the Project Area with the proposed wind turbine locations is shown on the map in **Figure 3 – Wind Turbine Overview.** The location of all associated infrastructure is discussed in Section II.D: Project Site Plan as found on page 13 and is shown in detail on the Project Site Plan maps in **Appendix C – Project Site Plan.**

The Project will interconnect to the existing Montezuma 345 kilovolt (kV) substation currently in operation and located within the Project Area in Section 35, Township 79N, Range 15W in Pleasant Township (Interconnection Substation). The Interconnection Substation is jointly owned by MidAmerican Energy Company (MidAmerican) and ITC Midwest and operated by MidAmerican. A new Project Substation, located adjacent to the Interconnection Substation, will also be constructed.

Tradewind Energy, Inc. (Tradewind) is the developer, owner, and the authorized agent for North English Wind Project, LLC. Tradewind is one of the most successful independent renewable energy development companies in the United States (US) with over 110 full-time employees. Tradewind's team of subject matter experts in wind resource analysis, mapping systems, environmental studies, permitting, land acquisition, and power marketing places a unique emphasis on the development craft which is unparalleled in the US renewable energy market. Tradewind has developed over 3 gigawatts (GW) of wind and solar across 27 projects that are either operating, in-construction, or are contracted, and has an 11 GW pipeline of additional projects under development. For purposes of this Application, Jeff Hammond, Development Manager, and Amber Zuhlke, Director of Environmental Studies and Permitting, at Tradewind will serve as Designated Representatives of the Project.

Tradewind's wind energy business model develops projects and then transfers those projects to another entity which will construct, own, and operate the Project. This is the intent with the North English Wind Project. The future owner and operator of the Project will be subject to the requirements of the Zoning Ordinance and any stipulation, conditions, or restrictions contained in the CUP for the Project if issued. See Zoning Ordinance at Article XX, Section 5.t.

Development, design, and construction of the Project in Poweshiek County, as described in this Application will result in an approximate $500 million investment in infrastructure, resulting in positive economic impacts in the general Project Area. The Project will provide direct economic benefits through property taxes generated for local government and taxing authorities, and through rent payments made to Project landowners. The Project will also result in significant and measurable indirect economic benefits to the general area, including increased retail activity at restaurants and gas stations and local purchase of construction materials and supplies, such as concrete, fuel, and aggregate to the extent that local businesses are reasonably and economically able to provide services and products. During construction it is anticipated that over 100 temporary construction related jobs will be created in the County and it is anticipated that up to 10-12 permanent local jobs will be required during Project operations. The result is high economic impact to the general area without straining local schools and County infrastructure.

B. Compliance with Poweshiek County Zoning Ordinance

The 2011 Poweshiek County Zoning Ordinance, as amended in March 2017 (Zoning Ordinance or Poweshiek County Zoning Ordinance), provides the application requirements for obtaining a CUP for a C-WECS. See Zoning Ordinance, Article XX, Section 5. North English has been working with County staff, the Board of Supervisors (BOS), and the Board of Adjustment (BOA) for over a year to ensure that this Application addresses all of the zoning and planning requirements of Article XX, Section 5.

The general requirements for C-WECS projects in Article XX, Section 5 of the Zoning Ordinance are summarized in below and are more fully described within the Application as noted.

Table 1 - General Requirements for C-WECS

Poweshiek County Requirement		**Location Where Addressed In CUP Application**
a.	**Color and Finish.** Wind Turbines shall be painted a non-reflective color. Blades may be black in order to facilitate de-icing. Finishes shall be matte or non-reflective. At C-WECS sites, the design of the buildings and related structures shall, to the extent reasonably possible, use materials, colors, textures, screening, and landscaping that will blend the C-WECS to the natural setting and existing environment. Exceptions may be made for meteorological	Section II.C(a)(2): Wind Turbines, Page 9

	towers, where concerns exist relative to aerial spray applicators.	
b.	**Turbine Configuration.** All wind turbines, which are part of a C-WECS, shall be installed with a tubular, monopole type tower. Meteorological towers may be guyed.	Section II.C(a)(2): Wind Turbines, Page 9
c.	**Lighting.** C-WECS sites shall not be artificially lighted, except to the extent required by the FAA or other applicable authority. Lighting, including intensity and frequency of strobe, shall adhere to but not exceed requirements established by Federal Aviation Administration permits and regulations. Red strobe lights are preferred for night-time illumination to reduce impacts on migrating birds. Red pulsating incandescent lights should be avoided. Exceptions may be made for meteorological towers where concerns exist relative to aerial spray applicators.	Section II.C(a)(2): Wind Turbines, Page 9
d.	**Signage.** All signage on site shall comply with Poweshiek County Sign Standards. The manufactures or owner's company name and/or logo may be placed upon the compartment containing the electrical generator, or the WECS. Wind turbines shall not be used for displaying any advertising expect for reasonable identification of the manufacturer or operator of the C-WECS sites.	Section II.C(a)(2): Wind Turbines, Page 9
e.	**Feeder Lines.** All communications and feeder lines, equal to or less than 34.5 kV in capacity, installed as part of a C-WECS shall be buried.	Section II.C(b)(2): Collection System, Page 11
f.	**Waste Disposal.** Solid and hazardous wastes, including but not limited to crates, packing materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site in a time period as established by the Poweshiek County Health Department and disposed of in accordance with all applicable local, state and federal regulations.	Section II.C(d): Other Items, Page 13
g.	**Minimum Ground Clearance.** The blade tip of any Wind turbine shall, at its lowest point, have ground clearance of no less than seventy-five (75) feet.	Section II.C(a)(2): Wind Turbines, Page 9
h.	**Signal Interference.** The applicant shall minimize and mitigate any interference with electromagnetic communications existing on the date of the approval of the Conditional Use Permit, such as radio, telephone or television signals caused by any C-WECS.	Section II.P, Page 22
i.	**Federal Aviation Administration.** All C-WECS shall comply with FAA standards and permits.	Section II. M, Page 21
j.	**Electrical Codes and Standards**. All C-WECS and accessory equipment and facilities shall comply with National Electrical Code (NEC) and other applicable standards.	Section II.L, Page 20

k.	**Setbacks.** (See Section II.E for additional Ordinance language)	Section II.E, Page 14
l	**Noise.** Audible noise caused by C-WECS site operations, not including existing ambient noise, shall not exceed fifty (50) dBA for more than 5 minutes within an hour, when measured at the exterior of any residence, school, hospital, church, or public library existing on the date of approval of the Conditional Use Permit. (Refer to Article XX, Section 5.l of the Zoning Ordinance for additional information and full citation.)	Section II.J, Page 20
m.	**Safety.** (See Section II.L for additional information)	Section II.L, Page 20
n.	**Discontinuation and Decommissioning.** (See Section II.N for additional Ordinance Language)	Section II.N, Page 21
o.	**Avoidance and Mitigation of Damages to Public Infrastructure.** (See Section II.Q for additional Ordinance Language)	Section II.Q, Page 23
p.	**Required Financial Security.** (See Section II.Q for additional Ordinance Language)	Section II.Q, Page 23
q.	**Pre-Application Review.** A Conditional Use Permit applicant may submit preliminary matters to the Board of Adjustment for review prior to making application for a permit. The review must occur no more than 60 days prior to submission of the application.	Section I.A, Page 1
r.	**Submittal Requirements.** In addition to the submittal requirements defined for Conditional Use Permit applications, all applications for C-WECS must submit the following information (as applicable). (See full list of requirements in Section II.C, Table 2)	Section II.C Table 2, Page 5
s.	**Submittal Requirements – Post-Construction.** As soon as reasonably possible and in no event more than 120 days following completion of construction of a C-WECS project, the applicant shall submit a final certification of compliance documenting the location of all individual wind turbines and demonstrating that all facilities are located within the permitted zoning area and meet all applicable performance standards, including setbacks.	Section II.D, Page 13
t.	**Transferability (**Refer to Article XX, Section 5.t of the Zoning Ordinance for Ordinance Language.)	Section I.A, Page 1

C. Poweshiek County CUP Application Submittal Requirements

In addition to the general requirements to be met in the construction of a C-WECS project, the Zoning Ordinance also establishes a list of items to be addressed at the time of filing the CUP Application in Article XX, Section 5.r. The list of submittal requirements and where each of those requirements is addressed within this Application is as follows:

Table 2 - CUP Submittal Requirements		
Poweshiek County Submittal Requirement		**Location Where Addressed in CUP Application**
1	Names of the Project Applicant and Designated Representative of the Project	North English Wind Project, LLC Jeff Hammond, Development Manager Amber Zuhlke, Director of Environmental Studies and Permitting Section I.A, Page 1
2	Name of project owner	North English Wind Project, LLC Section I.A, Page 1
3	Legal Description and Address of the Property	Section II.A, Page 7, and Appendix B
4	Description of the Project	Section II.C, Page 8
5	Site Layout (called Project Site Plan in this Application)	Section II.D, Page 13, and Appendix C
6	Engineers Certifications	Section II.F, Page 16
7	Documentation of land ownership, legal control or equivalent right to submit application	Section II.G, Page 16, and Appendix B
8	Latitude and Longitude of Individual Wind Turbines	Section II.H, Page 17, and Appendix E
9	USGS Topographical Map	Figure 4
10	Existing Resources Inventory	Section II.J, Page 17
11	An acoustical analysis	Section II.K, Page 20, and Appendix F
12	FAA Permit Application	Section II.M, Page 21 and Appendix G
13	Location of all known communications towers/facilities within two (2) miles of the proposed C-WECS	Section II.P, Page 22
14	Decommissioning Plan	Section II.N,

		Page 21 Appendix H
15	Description of potential impacts on nearby C-WECS and Non-CWECS and wind resources on adjacent properties.	Section II.I, Page 17
16	Identification of significant migratory patterns and nesting areas for birds within two (2) miles	Section II.J, Page 17
17	Proof of liability insurance	Section II.O, Page 22, and Appendix I

II. Project Description

The Project will be located in Poweshiek County, Iowa. The planned nameplate capacity for the Project is up to 340 MW of wind energy capacity. North English anticipates that it will use the Vestas V110-2.0MW wind turbine for the Project which has a hub height of 95 meters (m). The Project's permanent facilities will include:

- Up to 170 wind turbines and related equipment;
- New gravel access roads on private property for accessing wind turbine locations and associated facilities and improvements to existing public and private roads (as needed);
- Underground electrical collection and communication lines, with above ground junction boxes;
- O&M building (anticipated to be permitted and constructed under separate application if required); and
- Project Substation and a short span of overhead connection line, on Project Substation and Interconnection Substation property, from Project Substation to the existing Interconnection Substation.

A. Project Area/Legal Description and Location of Properties

The Project Area is located within 104 sections (containing approximately 50,226 acres) of mainly agricultural land in Poweshiek County, Iowa, situated north of the City of Montezuma (a description of the land cover types within the Project Area, as defined by the National Land Cover Database 2011, can be found is Section II.J: Existing Resources Inventory on Page 17. The total land area represented by Participating Properties in the Project Area (approximately 39,619 acres) is sufficient to construct the Project. For a list of the townships, sections, and ranges (all in Poweshiek County) that have portions included in the Project Area, see Table 3, below.

Table 3 - Site Location

Township Name	Township	Range	Section
Deep River	78N	13W	4-6
Jackson	78N	14W	1-6, 8-11
Lincoln	79N	13W	7-10, 15-20, 27-34
Malcom	80N	15W	21-22, 27-29, 32-35
Pleasant	79N	15W	1-4, 9-16, 19-30, 32-36

Scott	79N	14W	1-8, 10-15, 17-20, 22-36
Union	78N	15W	1-2

B. Project Timeline

North English anticipates that civil construction (i.e., roads, gravel pads, and potentially aggregate stockpiling) could begin as early as Fall 2017, provided that all pre-construction permits and approvals have been obtained. The proposed likely earliest Project Schedule is as follows, however each item in the timelines outlined below may be adjusted based on economic, weather, and other considerations solely identified by the Applicant:

- **Conditional Use Permit:** North English is filing this Application in May 2017. North English anticipates that, if approved, Poweshiek County will issue the permit by the end of June 2017.
- **Other Permits:** North English will acquire all other permits necessary for construction of the Project prior to conducting the work for which the permit is required.
- **Construction:** Project construction is anticipated to begin as early as late 2017 and be completed by December 2018. The potential earliest construction sequencing is as follows:
    - Initiation of Civil Construction (Roads) – Late 2017
    - Initiation of Foundation Construction – Late 2017
    - Initiation of Wind Turbine Deliveries – Q2 2018
    - Project Substation Complete – Q3 2018
- **Commercial Operations**: Based on the schedule noted above, North English anticipates full commercial operation to occur by the end of 2018.

1. Selection of the Project Area

The Project Area possesses a unique and favorable combination of traits which makes it ideally suited for wind development. Specifically, the Project Area has a robust wind resource, on-site existing electrical infrastructure for interconnection to the grid at the Interconnection Substation, and landowner support. Further, the Project is compatible with the existing land use and environmental features within the Project Area. These attributes, coupled with the current demand for wind power in Iowa make this area well-suited for wind energy development.

C. Project Description

Article XX, Section 5.r of the Zoning Ordinance provides specific CUP Submittal Requirements for C-WECS. Number 4 of these requirements calls for "A description of the project including: Number, type, name plate generating capacity, tower height, rotor diameter, and total height of all wind turbines and means of interconnection to the grid." The following is a description of the all of these planned site components.

a) Wind Turbines

(1) Wind Turbine Technology Generally

Wind turbines convert the kinetic energy of the wind into the rotational energy of a rotor and drivetrain. This energy is in turn converted into electrical power by industrial generators integrated within the wind turbine housing. An automated 'pitch' system will control the speed of the rotor by turning the face of each rotor blade into or out of the wind. Modern wind turbines typically produce energy in a wind speed range of 3.1 to 25 m per second or 7 to 56 miles per hour (mph). Power quality will be further accomplished through the use of power electronics, which convert generator output to achieve required output voltage and frequency control. An integrated wind speed and direction monitoring system works with a 'yaw' motion control system to keep the face of the wind turbine presented into the wind.

(2) Wind Turbines Planned for this Project

Up to 170 wind turbines will be constructed as part of the Project. At present, 182 wind turbine locations are still being considered and are depicted in the Project Site Plan. The final up to 170 locations will be chosen from those 182 potential locations and will be selected based on final geo-technical analysis, wetland and cultural resource work, landowner site approval, and other considerations. North English anticipates that the Vestas V110-2.0MW wind turbine will be used for the Project. Specifications for the Vestas V110 wind turbine are outlined below in Table 4. In accordance with the Zoning Ordinance, wind turbines will be monopole structures and will be painted in a non-reflective color with finishes to be matte or non-reflective. Also in accordance with the Zoning Ordinance, all signage shall comply with the County sign standards and the manufacturers name or logo may be placed on the wind turbine's nacelle (compartment containing the electrical generator), however, no advertising will be located on the wind turbines excepting for those reasonably used for the identification of the manufacturer or operator of the C-WECS site.

Table 4 - Wind Turbine Specifications

Wind Turbine Type	Rated Power (MW)	Hub Height (meters/ feet)	Rotor Diameter (meters/ feet)	Blade Length (meters/ feet)	Blade Height (Highest) (meters/ feet)	Blade Height (Lowest) (meters/ feet)
Vestas V110-2.0	2.0	95/311.7	110/360.9	54/180.4	150/492.1	40/131.2

Rotor Diameter

The maximum nominal rotor diameter for the Vestas V110-2.0 is 110 m/360.9 feet. The rotor consists of three blades mounted to a rotor hub. The hub is attached to the nacelle, which houses the generator, brake, cooling system, and other electrical and mechanical systems.

Blade Clearance

The blade height above ground level at its lowest point will be 40 m/131.2 feet with the 95 m hub height wind turbine. This blade clearance meets the Zoning Ordinance minimum ground clearance requirement of no less than seventy-five (75) feet ground clearance from the blade's lowest point and the ground.

Towers

The monopole tower on which the nacelle is mounted, will be constructed of conical tubular steel, with a hub height of 95 m (311.7 feet). A secured door at the base of the tower will provide access to each wind turbine and will be locked at all times when the wind turbine is not being serviced.

Lightning and Ground Protection

Lightning and ground protection for all Project equipment is designed and will be constructed to be compliant with all National Electric Code (NEC) and National Electric Safety Code (NESC) requirements. Grounding and shielding components are integrated into the foundation and structural elements of all equipment and conductor lines. In particular, each wind turbine will include conductive elements in the blades and a complete grounding and shielding network within the wind turbine, tower, and foundation.

Lighting

Wind turbines will only include lighting necessary to satisfy minimum FAA requirements. Steady burning lights will not be used and the only wind turbines to include any lighting will be those necessary to fulfill FAA requirements.

Foundation

Each wind turbine will sit atop a concrete foundation. Foundation size and design will be finalized once geotechnical analyses have been completed, however it is estimated the foundation could be approximately 60 feet in diameter and 9 to 12 feet in depth.

b) Associated Facilities

(1) Access Roads

Construction of and service access during operations to each wind turbine location and associated facilities will be facilitated by the construction of compacted gravel access roads within the Project Area. Access roads will be permanent, will be located on private property where Lease Agreements are in place, and will be located in consultation with the landowner. The permanent access roads will be approximately 16 feet wide when completed, however a wider area will be temporarily impacted and used during construction. Access roads will be constructed with locally-sourced gravel, if practicably available. The permanent Project access roads will support the size and weight of operation maintenance vehicles. Following construction, any temporarily affected areas will be restored to pre-construction conditions, to the extent practicable.

(2) Collection System

An electrical collection system (feeder lines) and communication lines, consisting of buried cables will interconnect all wind turbines to the Project Substation. This system will operate at 34.5 kV, and will be sited to minimize cost and land impacts. A small number of cabling junction boxes may be located above ground and marked with bollards and would be in line with or adjacent to other Project facilities. Once construction is complete, the temporarily affected land will be returned to pre-construction conditions, to the extent practicable. In accordance with Iowa law and regulations, each feeder line will be designed and constructed so that less than 25MW of nameplate generator capacity are connected to each such feeder line.

(3) Meteorological Towers

No permanent meteorological towers are being planned as part of the Project.

(4) Operations and Maintenance Building

An O&M building will be utilized to provide a year-round workspace and equipment storage, and to facilitate basic maintenance activities. The O&M building is anticipated to be located outside of the Project Area, and will be constructed near a year-round maintained public road. The location of the O&M building will be permitted under a separate permit application, if required. Lighting and signage at the O&M building, if needed and if subject to the Zoning Ordinance, will comply with the Zoning Ordinance requirements.

(5) Project Substation

The Project's underground collection system will extend from the wind turbines to a Project Substation. The Project Substation will be located

on approximately 6 acres and will be located in one of two potential locations immediately adjacent to the existing Interconnection Substation, as depicted on the Project Site Plan. Once a final location is established for the Substation, North English will comply with the subdivision regulations of the Zoning Ordinance for the necessary pre-construction approvals.

The Project Substation will be designed to provide voltage step-up from the 34.5 kV collection system to the 345 kV transmission system. This facility will house the production metering and various collection system and facility isolation and protective functions. The Project Substation will be fenced to provide site security and safety. Lightning and ground protection for all Project equipment, including the Project Substation, is designed and constructed to be compliant with all NEC, and NESC requirements, and the Zoning Ordinance. In addition, substation lighting and signage, if needed, will comply with the Zoning Ordinance requirements.

(6) Interconnection to the Existing Electrical Gird

The Project will interconnect to the existing Montezuma 345 kV substation (Interconnection Substation) currently in operation and located within the Project Area in Section 35, Township 79N, Range 15W in Pleasant Township. The Interconnection Substation is jointly owned by ITC Midwest and MidAmerican and is operated by MidAmerican. The Interconnection Substation is part of the existing electrical grid in Iowa and the transmission line(s) that interconnect at the Interconnection Substation connect to other parts of the grid in Iowa and beyond. The current design of the Montezuma Interconnection Substation will allow for expansion to accommodate the interconnection of the Project. Because the Project Substation will be located immediately adjacent to the existing Interconnection Substation, no overhead transmission line is needed for the Project. Instead, only a short span of overhead line will be built in order to connect the Project Substation with the existing Interconnection Substation.

(7) Other Improvements

Prior to construction, the Project will identify any necessary improvements to existing infrastructure such as roads, culverts, bridges, driveways, etc., as discussed in the Road Maintenance Agreement Section II.Q to support construction and ongoing operations of the Project. Such improvements may include temporary modifications such as increased turning radiuses to allow delivery of equipment and Project components during construction. Permanent improvements to infrastructure such as bridges, culverts, driveways and existing public

roads may also be necessary. All such improvements will be identified as part of the Road Maintenance Agreement for the Project.

c) Temporary Facilities

Other temporary facilities will be required for the construction phase of the Project, including a concrete batch plant, laydown area for equipment, parking and construction office trailers, intersection improvements to public roads to facilitate over-length turning, crane paths and working pads, and a staging area(s) for wind turbine and components delivery. The laydown yard will likely be located at one of three potential sites as depicted in the Project Site Plan, be temporary, may cover up to 30 acres, and will be used to temporarily store office trailers, vehicles, and other equipment to be installed as part of the Project. The temporarily affected areas will be restored to pre-construction conditions, to the extent practicable, after construction has been completed. North English will comply with any Zoning Ordinance requirements for any temporary construction staging area(s).

d) Other Items

As not otherwise described in this Application, during both construction and operations of the Project, solid and hazardous wastes, including but not limited to crates, packing materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site in a time period as established by the Poweshiek County Health Department and disposed of in accordance with all applicable local, state and federal regulations, in compliance with the Zoning Ordinance. Furthermore, waste disposal will be done in accordance with prudent industry best practices, and in accordance with the Lease Agreements.

D. Project Site Plan

In its Application, North English is providing a Project Site Plan. There are many factors that impact the final layout and design of a wind project, many of which continue to occur right up to or even during construction of the Project. This includes factors such as final geo-technical work and soil conditions at wind turbine locations, subsurface construction discoveries, final wetland and cultural surveys, landowner input and site approvals, receipt of crossing and driveway access permits from both the County and Iowa Department of Transportation (IDOT), if needed, as well as other items. Due to these final surveys, approvals, and agreements, small adjustments of the Project Site Plan prior to and during construction are routinely necessary when planning, designing, and constructing a wind project. Thus, it is not realistic for any wind energy developer to provide a completely final Project Site Plan at the time of its CUP application; however, an updated Project Site Plan will be provided before a Building Permit Application; and the final post-construction certification of compliance will be provided in accordance with the Zoning Ordinance. The Project Site Plan attached in **Appendix C – Project Site Plan** is as complete as possible based on current engineering and design information. North English requests that the Board of Adjustment include as a condition of the CUP a restriction on the ability to adjust C-WECS components by expressly limiting any such adjustments to no more

than 500 feet and further provided that the shift in location still complies with other provisions of the Zoning Ordinance.

The Project Site Plan also shows multiple possible options for the location of some infrastructure components (access roads, electrical collection lines, etc.) and shows all wind turbine locations being considered (182 locations being considered, with no more than 170 locations ultimately to be constructed). North English requests all these infrastructure and wind turbine locations be approved for use in the CUP, with the expressed condition and understanding that only a subset of such infrastructure and wind turbines will be built, based on the final geo-technical analysis, wetland and cultural resource work, landowner site approval, and other considerations. This flexibility allows North English to incorporate ongoing study results, permit processes, unanticipated discoveries during construction, and landowner input into the final Project Site Plan design while still complying with the Zoning Ordinance. An updated Project Site Plan showing the location of all infrastructure and the selection of the final subset of wind turbine locations will be submitted at the time of the Building Permit Application. A final "as built" constructed Project Site Plan and certification of compliance will be submitted to the County no more than 120 days following completion of construction, per Article XX, Section 5.s of the Zoning Ordinance.

Based on the analyses completed to date, North English's planned wind turbine layout optimizes electrical generation and efficiency while avoiding or minimizing potential or perceived environmental, cultural, economic, and existing land use impacts. North English has worked and will continue to work diligently with its landowner partners to ensure that the Project integrates successfully with the existing land use, facilities, and infrastructure.

In addition to the Project Site Plan in **Appendix C – Project Site Plan**, a USGS Topographical Map of the Project is included as **Figure 4 – USGS Map**.

E. Setbacks

Below, Table 5 identifies the setback requirements for each wind turbine and meteorological tower as designated in Article XX, Section 5.k of the Zoning Ordinance. Setbacks shall be measured from the center point of the base of the wind turbine tower or meteorological tower, as applicable. As noted in this Application, at this time the Applicant is not requesting a CUP for any MET towers. In addition, "Total Tip Height" is defined as the total height of the wind turbine measured at the highest point of the blade system during rotation.

Section 5.k of the Zoning Ordinance allows for the Board of Adjustment to "reduce the standard setbacks and separation requirements if the intent of [the] Ordinance would be better served thereby; and if the participating or adjoining property owner affected by the reduced setback or separation completes a written waiver recorded with the Poweshiek County Recorder."

Table 5 - Setback Distances as Designated by Poweshiek County Zoning Ordinance	
Setback Type	**Distance**
Nearest residence, school, hospital, church or public library	Setback from identified structures is a minimum of no less than the greater of

	(a) two (2) times Total Tip Height or (b) one thousand (1,000) feet
Property Lines	Setback from property lines is a minimum of 1.1 times Total Tip Height and no part of the wind turbine or metrological tower may overhang an adjoining property. Setbacks can be reduced with a written and recorded waiver.
Public Right-of Way (ROW) (setback from nearest edge of recorded public road ROW or railroad ROW where infrastructure exists)	Setback from the edge of a public right-of-way is a minimum of 1.1 times Total Tip Height
Communication and Electrical Lines (above-ground public utility electric power line or public utility telephone line)	Setback from public communication and electrical lines is a minimum of 1.1 times Total Tip Height
Communication and Electrical Lines (private electrical power lines of 15kV or less and private telephone service lines)	Setback from private communication and electrical lines is a minimum of 1.1 times Total Tip Height but may be reduced with a written and recorded waiver

The Project has been designed to comply with all of the Zoning Ordinance setback requirements. Property lines are considered to be the outside boundary of contiguous land included in each individual Lease Agreement, Authorized Agent Form, or other land control documents contained in Appendices B and D, as of the date the documents were signed.

Where a reduction in a setback is necessary to the Project, North English has obtained written waiver of applicable setback requirements from the affected landowner and are evidenced by a Memorandum of Setback Waiver Agreement (Setback Waiver Agreement). Landowners who have signed a Lease Agreement have acknowledged and agreed to accept necessary setback waivers. For landowners who have not yet signed a Lease Agreement but who have provided an Authorized Agent Form for submittal of the CUP on their property, a Setback Waiver Agreement has been obtained where necessary. A full list of the instances where a setback waiver is necessary based on the Ordinance, and has been complied with by either a Lease Agreement or with a Setback Waiver Agreement, can be found in **Appendix D – Setback and Sound Waivers**, and are, or will be, recorded in accordance with the Zoning Ordinance.

As part of this Application, North English is requesting that the BOA approve the adjustment of setback requirements as outlined in the table in **Appendix D – Setback and Sound Waivers**. As noted in **Appendix D – Setback and Sound Waivers**, signed waivers, as either Lease Agreement provided in **Appendix B – Legal Description and Location of Property** or Setback Waiver Agreement provided in **Appendix D – Setback and Sound Waivers**, from each of the affected landowners have been obtained. North English requests the necessary setback adjustments as the intent of the Ordinance would be better served by fully attaining the benefits achieved by these setback adjustments for the Project, landowners, and Poweshiek County in terms of

efficient electrical generation and transmission, property tax revenue generation, landowner Lease Agreement revenues, convenience of landowners farming activities, and/or preservation of agricultural uses on the permitted land.

The applicable setback distances for each wind turbine location are depicted on the Project Site Plan attached as **Appendix C – Project Site Plan**.

Consistent with the residential structure setback noted above, no wind turbine will be located within 1,000 feet of residences. As shown in the Project Site Plan, the closest proposed wind turbine location is approximately 1,326 feet from the nearest participating residence, a residence located on a Participating Property, (1,513 feet from the nearest non-participating residence). The same 1,000 foot restriction applies to schools, hospitals, churches and public libraries and is maintained in the North English Project Site Plan.

F. Engineer's Certification

Per Section 5.m.5 of the Poweshiek County Zoning Ordinance, "For all C-WECS, the manufacturer's engineer or another qualified engineer shall certify that the wind turbine, foundation, and tower design of the C-WECS is within accepted professional standards, given local soil and climate conditions." Because final Project Site Plan design has not yet been finalized at the time of this CUP Application and insubstantial adjustments up to 500 feet from the depicted locations is requested as a condition to the CUP, as described above in Section II.D, final engineer's certifications are not yet available. Once design has been updated, the Project shall provide engineered drawings and certifications for the wind turbine, foundation, and tower design, stamped by a qualified Professional Engineer certified in the state of Iowa. Final engineer certifications will be submitted at the time of the Building Permit Application.

G. Documentation of Land Ownership, Legal Control, or Equivalent Right

North English has executed Lease Agreements with landowner partners within the Project Area. These executed Lease Agreements expressly authorize North English to seek a CUP for the specified property governed by the Lease Agreement. Separately, in some limited areas where the Project Site Plan depicts the placement of infrastructure and Lease Agreements are not yet executed, or is anticipated to execute other land rights agreements, North English has obtained landowner authorization to submit this CUP Application for approval of infrastructure on their property via an Authorized Agent Form included in **Appendix B – Legal Description and Location of Property**. Lease Agreements or other agreements with landowner partners not executed prior to this CUP Application will be executed prior to the start of construction. Table 1 in **Appendix B – Legal Description and Location of Property** details each property and property owner where Lease Agreements are either executed or are under negotiation and where an Authorized Agent Form has been received. An overview of the Project Area and the properties where either a Lease Agreement or Authorized Agent Form have been executed is shown in **Figure 2 – Participating Properties**.

Copies of the Lease Agreement, which have been recorded with the Poweshiek County Recorder's Office as of the date of this Application, or are fully executed and will be recorded prior to CUP approval, or, the landowner Authorized Agent Forms allowing for the CUP

submittal on their property are also provided in **Appendix B – Legal Description and Location of Property**.

H. Latitude and Longitude of Individual Wind Turbines

A table showing the anticipated latitude and longitude of individual wind turbines is provided in **Appendix E – Wind Turbine Latitude and Longitude Table**. Each proposed wind turbine location may be adjusted no more than 500 feet from the location given in **Appendix E – Wind Turbine Latitude and Longitude Table**, as described in Section II.D.

I. Potential Impacts on Nearby C-WECS, Non C-WECS, and Wind Resources

Article XX, Section 5.r of the Zoning Ordinance provides specific CUP filing requirements for C-WECS. Number 15 of these requirements calls for a "description of the potential impacts on all nearby C-WECS and Non C-WECS and wind resources on adjacent properties".

Wind turbines generate electricity by turning the natural kinetic energy of wind into mechanical energy which is converted into electricity through a generator. Because of this, the space immediately downwind of a wind turbine may have decreased wind power potential (decreased wind speed) since the wind turbine itself uses some of the wind's energy to turn the wind turbine blades. This decrease in the wind's energy or wind speed is mainly limited to the height of the wind turbine's rotor (131-492 feet in the air) and is recovered a short distance away from the wind turbine depending on a number of factors such as wind speed, topography, ground cover, and other landscape features. Thus, the potential impact of the Project on other C-WECS, Non C-WECS and the general wind resource would be from the small decrease in the wind's energy or wind speed on the downwind side of the Project's wind turbines approximately 131-492 feet in the air.

The proposed Project will not have any significant impacts on any existing nearby C-WECS. The only existing C-WECS that North English is aware of, based on reviews of the FAA database, aerial photography, and site visits during the Project's development, is one located east of Grinnell approximately two miles as shown on **Figure 5 – Location of Nearby C-WECS and Communication Towers** (Grinnell C-WECS). This Grinnell C-WECS would be approximately 3.75 miles, or 6,100 m, from any of the proposed Project wind turbines locations. The Grinnell C-WECS is at such a distance that it would not experience any significant impacts from the North English proposed wind turbine locations.

In addition to the North English Project described in this CUP application, Tradewind Energy is also developing the proposed English Farms Wind Project under English Farms Wind Project, LLC. The proposed English Farms Wind Project, for which a separate CUP Application has or will be submitted, is located south and east of the North English Project. Having developed both the North English Wind Project and the English Farms Wind Project in parallel, both Projects have been designed to include a reasonable distance between their wind turbines to help mitigate the potential impacts on the neighboring Project. Development of each Project has assumed that both Projects will be in operation and neither project will have a material impact on the wind resource of the other Project.

While an extensive search for existing Non C-WECS near the Project has not been conducted, the impact of the proposed utility scale wind turbines would be negligible to commonly

operating Non C-WECS, should they be present in the Project vicinity, due to the height of such machines as compared to C-WECS wind turbines. While it is plausible that a C-WECS would minimally decrease the wind speeds at lower heights where Non C-WECS would likely be operating, this decrease would likely be in only rare instances, be no greater than 0.5 mph, and would be dependent upon other landscape features such as ground cover and topography. Thus, potential impacts to Non C-WECS would be minimal, if at all noticeable, to the operator.

The wind resources on immediately adjacent properties are impacted by the proposed Project, largely at heights greater than 130 feet above the ground level, with variations depending on the distance of the wind turbine to the adjacent property, local land cover, and topography. However, as discussed above, the impact to wind resources on adjacent properties and on Non C-WECs would be minimal, if it existed at all. In addition, there is minimal likelihood of a C-WECS being installed in close proximity to the Project and, any subsequent wind developer would be aware of the Project and would necessarily evaluate the constraints on that project and design the future project accordingly.

J. Existing Resources Inventory

An important part of North English's due diligence and development process for the Project has been an analysis of the existing environmental resources potentially occurring within and in close proximity to the Project Area. This effort has been conducted in a manner consistent with the 2012 US Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines (WEG). The WEGs are a set of guidelines and recommendations from the USFWS that outline a tiered process for assessing potential impacts to wildlife and their habitats that could result from development of a wind energy development.

Environmental surveys and due diligence for the Project have been ongoing since 2008. Survey work has been conducted by independent environmental consultants contracted by North English. This suite of environmental surveys has included initial environmental assessments and land use analysis, avian and eagle activity surveys, eagle and raptor nest surveys, bat acoustic surveys, and habitat mapping. This survey and development process has included on-going correspondence and coordination with Federal, State, and local agencies including the USFWS and the Iowa Department of Natural Resources (IDNR) and has focused heavily on avian and bat species since these are the species known to have potential risk from wind facilities.

The majority of the Project Area is composed of agricultural lands (cropland and hay/pasture) as is typical for central Iowa. Based on the National Land Cover Database 2011, land cover for the Project Area can be broken down as follows:

Table 6 - Land Cover Types within the Project Area

Land Cover Type	Acres within the Project Area	Percent of Total Land Cover (%)
Agricultural Lands (Cultivate Crops, Hay/Pasture)	43,550	86.7
Developed (Homesteads, Farms, etc.)	2,959	5.9
Herbaceous (Grasslands)	3,038	6.0
Deciduous Forest	529	1.1
Open Water	62	0.1

Wetlands	89	0.2
Total:	**50,226**	**100**

The Project is located in the Mississippi Migration Flyway, but is not near a principal migratory route. The Mississippi Migration Flyway is broadly defined as the aggregate of species-specific avian migration routes that follow a wide swath generally along the Mississippi River in the United States and the Mackenzie River in Canada. The migratory flyway is contained between central Canada and the Gulf of Mexico, and covers the following states: Minnesota, Wisconsin, Michigan, Iowa, Illinois, Indiana, Ohio, Missouri, Kentucky, Arkansas, Tennessee, Louisiana, Mississippi, and Alabama. Although not near a principal migratory route, site specific avian surveys conducted for the Project have looked at bird use and migratory patterns specific to the Project Area. The results of these avian surveys did not identify significant concentrations of migratory birds or any concentrated flight corridors within the Project Area. The species identified during surveys are consistent with the bird species expected to be present in similar agricultural landscapes in Iowa, no federally listed threatened or endangered bird species were identified and the most common species observed included Red-winged Blackbird, American Robin, and Turkey Vulture.

In addition to the general avian surveys discussed above, North English has been completing specific Bald Eagle use surveys within the Project Area. These specific surveys have been designed in consultation with the USFWS and are consistent with the USFWS Eagle Conservation Plan Guidance. The results of these surveys have shown little Bald Eagle use in the Project Area during the summer months with more frequent use during the winter. Aerial eagle and raptor nest surveys, conducted via helicopter, have also been completed within the Project Area as well as a 5 mile buffer surrounding the Project Area. The nest surveys did not identify any significant or concentrated nesting areas for birds. The results of these surveys are incorporated into Project development and siting and are also part of ongoing conversations with USFWS regarding the Project and potential environmental permits.

Regarding bats, the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened Northern Long-eared bat *(Myotis septentrionalis*) have been detected in the Project Area; however, potential impacts to both Northern Long-eared bat and Indiana bat species are expected to be low based on the results of the acoustic surveys and due to careful siting efforts such as siting wind turbines and infrastructure away from bat habitat areas and incorporating the USFWS recommended buffer of wind turbines being sited a minimum of 1,000 feet from designated bat habitat. Although expected to be low, potential impacts to bat species are also part of the ongoing conversations with the USFWS regarding the Project.

North English has undertaken extensive efforts to understand the environmental resources present within and near to the Project Area over the last nine years and has undertaken appropriate measures to avoid or mitigate potential impacts to biological resources to the extent possible. In addition, as suggested and outlined in the WEGs, the Project will continue to coordinate with the IDNR and USFWS regarding potential impacts to avian and bat species before, during, and after construction and during operations and the Project will work with those agencies to secure appropriate concurrences or permits should such concurrences or

permits be deemed necessary. In addition, the Project will develop and implement a voluntary Bird and Bat Conservation Strategy (BBCS). A BBCS is a project-specific document that describes the steps a developer has taken to apply the WEGs and to address and mitigate for any potential wildlife impacts.

K. Acoustical Analysis

In order to assure compliance with Article XX, Section 5.l of the Zoning Ordinance, North English conducted an acoustical analysis utilizing the WindPRO 3.0 software to demonstrate that the wind turbine array will comply with the noise requirements set forth therein 5.l of the Zoning Ordinance. In addition to the North English Project, Tradewind Energy is also developing the proposed English Farms Wind Project under English Farms Wind Project, LLC. The English Farms Wind Project is located south and east of the North English Project. To be conservative, and in order to ensure that residences between the two projects were covered in the acoustical analysis, both the North English Project and English Farms Wind Project were modeled together. This analysis was reviewed and validated by Robert O'Neal of Epsilon Associates Inc. Mr. O'Neal is Board Certified by the Institute of Noise Control Engineers. Details of the acoustical analysis and results can be found in **Appendix F – Acoustical Analysis.**

In summary, all residential locations modeled are anticipated to have sound levels from the proposed wind turbines of both North English and English Farms collectively to be below 50 dB(A), which is required by section 5.I of the Zoning Ordinance, under anticipated normal operating conditions. The normal operating conditions assume a sound emission from the wind turbine of 107.6 dB(A) for the North English wind turbines and 107.5 dB(A) for the English Farms wind turbines, which is provided by the wind turbine manufacturer of the loudest wind turbines under consideration respectively for each project.

To allow for some uncertainty in the modeling results, the sound model was also conducted under conservative assumptions that all of the North English wind turbines had a sound emission of 109.6 dB(A) and a 95m Hub Height (HH) and the English Farms turbines had a sound emission of 109.5 dB(A) for an 80 m HH (lowest height being considered at English Farms). These conservative value are typical for sound engineers to assume and is based on the loudest wind turbine being considered for each respective Project. When modeling the sound under the conservative conditions, only two residential locations within the North English footprint were anticipated to have worst case scenario sound from the wind turbines to be above 50 dB(A). The proximity of the wind turbines to these two residential locations were asked for by the impacted participating landowners, on Participating Property, and a written sound waiver, recorded with the Poweshiek County Recorder's Office as required in the Zoning Ordinance, have been obtained and either are recorded or will be recorded prior to the CUP approval. A copy of these waivers are attached in **Appendix D – Setback and Sound Waivers**. All other residential locations were anticipated to have a worst case scenario sound from the wind turbines to be below 50 dB(A).

L. Safety

The final design of the Project shall be in accordance with all of the applicable NEC, American National Standards Institute (ANSI), Institute of Electrical and Electronics Engineers (IEEE), and National Electric Manufacturers Association (NEMA) standards. In addition, per Article XX,

Section 5.m, the final Project Site Plan design will meet the following requirements and/or the following practices will be implemented by the Project owner/operator, including engineering certifications as required by the Zoning Ordinance:

1. All wiring between wind turbines and the Project Substation shall be underground.
2. Wind turbines and METs will not be climbable up to 15 feet above ground.
3. Access doors to wind turbine tower and equipment will be locked when not being serviced.
4. Appropriate warning signs will be placed on wind turbines, electrical equipment, and C-WECS entrances as applicable and necessary.
5. An engineer will certify the design of the Project's wind turbines, foundations, and tower designs is within accepted professional standards. See additional information in Section F: Engineering Certifications.
6. No guyed structures requiring marking will be built as part of the permanent Project.

M. FAA Permit Applications

The Project filed FAA Form 7460-1 Notice of Construction for 201 wind turbines on April 20, 2017 and 10 on May 15, 2017. The 182 wind turbine locations being considered in this Application are a subset of these two filings. Each wind turbine was assigned an Aeronautical Study Number (ASN) and the studies are currently in progress. Filing documentation, including the Project Submission Success Record and the Project Summary are attached in **Appendix G – FAA Permit Applications**. It is anticipated that the FAA will issue Determinations of No Hazard (DNH) for the Project wind turbines within three months; however the FAA review may take longer depending on FAA approval times. The Project was initially filed with the FAA and received DNHs in July 2015; however, those initial determinations expired in January 2017. DNHs will be received prior to the installation of the wind turbines.

N. Decommissioning Plan

Consistent with the Zoning Ordinance, North English agrees that upon discontinued use or at the end of the Project's serviceable life, the Project will be decommissioned as set forth in Article XX, Section 5.n. of the Zoning Ordinance. The North English Decommissioning Plan includes removing all above-ground facilities, including tower foundations, to a depth of at least four (4) feet below ground level. The Zoning Ordinance recognizes that the value of the equipment and facilities of the Project will exceed decommissioning costs during the first fourteen (14) years of the Project and that positive economic value will provide the necessary financial resources to pay for decommissioning and removal of C-WECS facilities should that extremely unlikely need arise. Beginning in year fifteen (15) after commencement of commercial operations and continuing through the remaining life of the Project, North English will provide a performance bond, letter of credit or other financial security approved by the County Attorney in an amount equal to the net decommissioning cost, as determined by an Iowa-licensed Professional Engineer. Any performance bond or letter of credit issuer will be subject to the approval of the County and the operator. These commitments of financial resources and security are expressly

intended to be part of and incorporated into the Decommission Plan attached as **Appendix H – Decommissioning Plan.** In addition to these Decommissioning Plan requirements, each Lease Agreement includes contractual decommissioning obligations that must be performed by the Project on behalf of the landowners.

O. Proof of Liability Insurance

Article XX, Section 5.r.17 of the Zoning Ordinance requests proof of liability insurance. North English Wind Project, LLC carries commercial general liability insurance of $1 million per occurrence with a $2 million aggregate limit, as well as umbrella liability insurance of $5 million per occurrence with a $5 million aggregate limit, and will keep such insurance in place as it pursues the Project. A copy of the Certificate of Liability Insurance is attached in **Appendix I Proof of Liability Insurance**. Proof of liability insurance (or self-insurance provided by an appropriate entity acceptable to the County) will be updated at the time of Building Permit Application. In addition to general liability insurance required by the Zoning Ordinance, all Lease Agreements include a requirement that the owner/operator of the Project, as Lessee, maintain commercial general liability insurance covering property damage and liability for personal injury or death on or about the landowner's property as well as contractual indemnities.

P. Signal Interference

In February 2016, a suite of studies was conducted by a third-party vendor, Comsearch, to analyze electromagnetic communications within the Project Area and a surrounding buffer. The studies included analyses of microwave paths, AM and FM radio broadcast stations, off-air television station broadcast signals, registered frequencies for emergency services, and communication towers. The aforementioned studies are used to site wind turbines in a manner that avoids or minimizes potential impact to electromagnetic communication and meets required and recommended setbacks from land mobile fixed-based stations and communication towers, respectively.

In addition, the Project coordinated with the National Telecommunication and Information Administration in February 2016. Through this coordination, all agencies represented in the Interdepartment Radio Advisory Committee (IRAC) were allowed to review and provide comments on the Project. After a 45-day review, no IRAC agencies identified concerns with the Project.

In addition to the above described effort, and in compliance with Zoning Ordinance C-WECS CUP Submittal Requirement Number 13, all communication towers/facilities within two (2) miles of the Project Area were identified. The microwave study completed by Comsearch, "…focuses on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems." In addition, North English staff conducted an in-house analysis with the aid of a telecom research and mapping software, SiteSync Pro. Any communication towers or facilities identified within two (2) miles of the Project Area through this analysis are shown in **Figure 5 – Location of Nearby C-WECS and Communication Tower**.

Q. Road Maintenance Agreement

Article XX, Section 5.o. and 5.p of the Zoning Ordinance address the obligations of North English to avoid, mitigate and remedy any damages caused to public infrastructure (i.e., roads, bridges and associated facilities). North English agrees as part of the Application that prior to construction it will: a) identify all affected roads within the County to be used for the purpose of transporting major parts, supplies, construction materials or equipment and obtain any applicable weight and size permits for use of those roads before construction; b) conduct a pre-construction survey with the local road authorities to determine and document pre-construction road conditions (including by photographs, video and/or written documentation); c) enter into a Road Maintenance Agreement (RMA) with the County specifying that North English will i) be responsible for ongoing road maintenance and reasonable dust control measures during construction (as identified by the County Engineer); ii) be responsible for immediate repair of damage to public drainage systems stemming from construction, operation or maintenance of the Project; and iii) upon completion of the Project construction meet with the County Engineer to reach agreement on the necessary action, if any, needed to return the identified roads, bridges and associated infrastructure to pre-construction condition where negative impacts as the result of Project construction are documented and where determined necessary by the County Engineer in consultation with the Project.

North English further understands and agrees that it will be responsible for restoring or paying damages as agreed to by the local road authorities and set forth in the RMA. North English will provide financial security in a manner approved by the County Attorney covering 130% of the costs of all required and identified improvements or restoration, unless an alternative financial security agreement is reached and acted upon by the Board of Supervisors upon recommendation of the County Engineer and/or County Attorney. North English will enter into a RMA with the County, outlining compliance with all of the above stated requirements prior to the Building Permit Application. North English shall repair damage to public drainage systems stemming from construction, operation or maintenance of the C-WECS as provide in the Zoning Ordinance [See Section 5.o.3].

III. Supplemental Information

A. Public Health, Safety, Comfort, or General Welfare

Studies and government health organizations around the world have generally given wind a clean bill of health and found no evidence of health effects from wind turbines. For example, a major study in Canada of over a thousand homes stated "No evidence was found to support a link between exposure to wind turbine noise and any of the self-reported illnesses."[5] Wind energy projects in Iowa and nationally have demonstrated they are not detrimental to or endanger public health, safety, comfort or general welfare. Wind energy is a clean, economical, and sustainable form of energy. As discussed throughout this Application, the Project will

[5] Health Canada, 2014. http://www.hc-sc.gc.ca/ ewh-semt/noise-bruit/turbine-eoliennes/pamphlet-brochure-eng.php

comply with all applicable federal, state, and local health and safety regulations. For instance, as discussed in Section II.E the Project has been designed to meet or exceed the Poweshiek County setback requirements except in a limited number of unique circumstances where applicable waivers have been obtained or will be obtained as described in this Application.

B. Shadow Flicker

Shadow flicker occurs when the rotating blades of a wind turbine are directly between an observer and the sun, causing alternating light and shadow. The effect decreases and ultimately disappears with distance from the wind turbine, and is also eliminated by obstacles between the observer and the wind turbine, such as trees or terrain. Shadow flicker is predictable, and can be minimized through wind turbine site selection. Shadow flicker is harmless to humans, though it may be considered by some to be an annoyance. No local, state, or federal guidelines exist that determine an acceptable threshold for shadow flicker. However, shadow flicker is considered during the site development process and modeled within the WindPRO software to aid in selecting wind turbine locations to minimize shadow flicker at residences.

C. Property Values

The Project will be located on mainly agricultural land, and North English has designed the Project to minimize agricultural impacts. Although the Project Area covers approximately 50,226 acres, only 114 acres (or less than 0.003% of the Project Area) will be permanently impacted by the Project. The remainder of the Project Area can continue to be used for its current purposes.

Based on historical, nationally reviewed data, the Project is also not expected to have a negative effect on the value of the Participating Properties or adjoining or nearby properties. Multiple studies have shown that property values are not impacted by the presence of a wind energy facility. In 2013, Lawrence Berkeley National Laboratory (LBNL) examined more than 50,000 home sales among 27 counties in nine states, including 4 counties in Iowa. These homes were within 10 miles of 67 different wind facilities, and 1,198 sales were within 1 mile of a wind turbine. Based on a detailed analysis the researchers were unable to uncover any impacts to nearby home property values in the post-construction or post-announcement/pre-construction periods. A copy of this report is included in **Appendix J – Property Values Study**. Based on this and other studies, the Project is not expected to substantially impair or diminish the value and enjoyment of property near and within the Project Area. Importantly, the presence of C-WECs components can improve the economic value of the land where the facilities are located, to the benefit of the owners.

D. Drain Tile

The Lease Agreements require any drain tile that is encountered and damaged during construction will be repaired in a timely manner using qualified contractors, ensuring the drainage system is returned to a condition substantially similar to the condition that existed prior to when the damage occurred. Records of the repair will be documented and made available to the landowners in the Lease Agreements. Furthermore, the Lease Agreements also allow the property owners in the Lease Agreement or their designated representative to be present for repairs of the drainage system on the property. North English shall repair damage to public drainage systems stemming from construction, operation or maintenance of the C-WECS.

Finally, as set forth in the Lease Agreement, the Lessee (as defined in the Lease Agreement) is contractually obligated to restore the property disturbed by the Lessee.

IV. Conclusion

As discussed above, the Project and the Application comply with the applicable requirements set forth in the Poweshiek County Zoning Ordinance. Therefore, North English Wind Project, LLC, respectfully requests that the Poweshiek County Board of Adjustment (1) issue a CUP for the North English Wind Project as proposed herein, and (2) include as part of the CUP specific conditions and restrictions consistent with this Application, including those set forth in **Appendix K – Permit Conditions**.