SECTION 28. WIND ENERGY CONVERSION FACILITIES

SECTION 28.1 Wind Energy Installation

In any zoning district where a wind energy conversion system (WECS) is allowed, a conditional use permit may be granted to allow a WECS, including such devices as a wind charger, or wind turbine; subject to the regulations established in this section.

SECTION 28.2 Small Wind Energy Systems

28.2.1 Purpose

It is the purpose of this regulation to promote the safe, effective and efficient use of small wind energy systems installed to reduce the on-site consumption of utility supplied electricity in Garden County.

28.2.2 Definitions

The following are defined for the specific use of this section.

1. *Small Wind Energy System* shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-site consumption of utility power.

2. *Tower Height* shall mean the total height of the Wind Energy Conversion System from grade to the center of the hub.

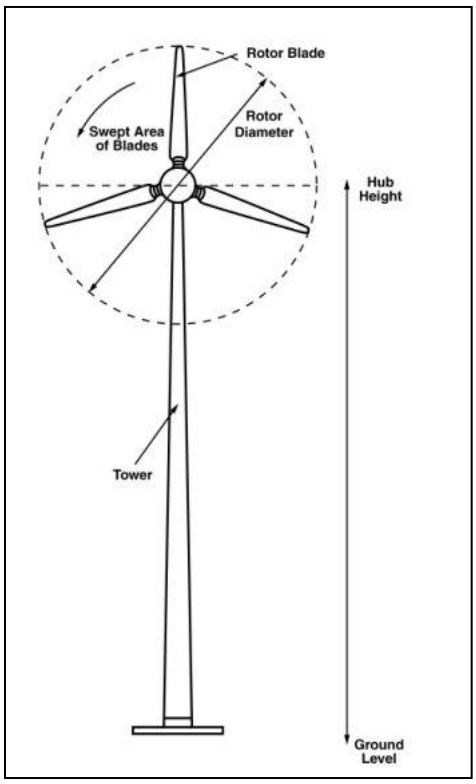

Figure 1

28.2.3 Requirements

Small wind energy systems shall be permitted as an Accessory Use within any district.

Certain requirements as set forth below shall be met:

28.2.3.1. Tower Height

A. The tower height shall be limited to 90 feet.

28.2.3.2. Setbacks

A. No part of the wind system structure, including guy-wire anchors, may extend closer than the building setbacks of the appropriate zoning district to the property lines of the installation site.

28.2.3.3. Noise

A. Small wind energy systems shall not exceed 50 dBA, as measured at the closest neighboring inhabited dwelling unit.

B. The noise level may be exceeded during short term events such as utility outages and/or severe wind storms.

28.2.3.4. Approved Wind Turbines

A. Small wind turbines must have been approved under the Emerging Technologies program of the California Energy Commission or any other small wind certification program recognized by the American Wind Energy Association.

28.2.3.5. Compliance with Building and Zoning Codes

A. Applications for small wind energy systems shall be accomplished by standard drawings of the wind turbine structure, including the tower base, and footings.

B. An engineering analysis of the tower showing compliance with official building code of the governing body and/or the State of Nebraska certified by a professional engineer licensed and certified in Nebraska shall also be submitted. The manufacturer frequently supplies this analysis.

C. Wet stamps shall not be required.

28.2.3.6. Compliance with FAA Regulations

A. Small wind energy systems must comply with applicable FAA regulations, including any necessary approvals for installations close to airports.

28.2.3.7. Compliance with National Electrical Code

A. Permit applications for small wind energy systems shall be accompanied by a line drawing of the electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the National Electrical Code. The manufacturer frequently supplies this analysis,

28.2.3.8. Utility Notification

A. No small wind energy system shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned generator,

B. Off-grid systems shall be exempt from this requirement.

Section 28.3 Commercial/Utility Grade Wind Energy Systems

28.3.1 Purpose

It is the purpose of this regulation to promote the safe, effective and efficient use of commercial/utility grade wind energy systems within Garden County.

28.3.2 Definitions

The following are defined for the specific use of this section.

1. *Aggregate Project* shall mean projects that are developed and operated in a coordinated fashion, but which have multiple entities separately owning one or more of the individual WECS within the larger project. Associated infrastructure such as power lines and transformers that service the facility may be owned by a separate entity but are also part of the aggregate project.

2. *Bank of the North Platte River* shall mean the banks of the river which are the elevation of ground which confines the water at a level not exceeding flood stage. Measurements for the purpose of determining the river setback shall be based on the banks of the river as established by the Nebraska Department of Natural Resources for the purpose of establishing the boundary of the Garden County Refuge at the time of application.

3. *Commercial WECS/utility grade* shall mean a wind energy conversion system of equal to or greater than 100 kilowatts (KW) in total name plate generating capacity.

4. *Feeder Line* shall mean any power line that carries electrical power from one or more wind turbines or individual transformers associated with individual wind turbines to the point of interconnection with the electric power grid. In the case of interconnection with the high voltage transmission systems the point of interconnection shall be the substation serving the wind energy conversion system.

5. *Force Majeure* shall mean a fire, earthquake, flood, or other acts of God; strikes or labor disputes; war, civil strife, or other violence; or any other condition beyond the reasonable control of a Party hereto.

6. *Meteorological Tower* shall mean, for purposes of this regulation, a tower which is erected primarily to measure wind speed and directions plus other data relevant to siting or operating a Wind Energy Conversion System. Meteorological towers do not include towers and equipment used by airports, the Nebraska Department of Roads, or other applications to monitor weather conditions.

7. *Property Line* shall mean the legally defined described boundary.

8. *Public Conservation Lands* shall mean land owned in fee title by State or Federal agencies and managed specifically for conservation purposes, including but not limited to State Wildlife Management Areas, State Parks, federal Wildlife Refuges and Waterfowl Production Areas. For purposes of this regulation, public conservation lands will also include lands owned in fee title by non-profit conservation organizations. Public conservation lands will also include private lands upon which conservation easements have been sold to public agencies or non-profit conservation organizations.

9. *Rotor Diameter or Diameter* shall mean the diameter of the circle described by the moving rotor blades as shown in Figure 1.

10. *Small Wind Energy System* shall mean a wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-site consumption of utility power.

11. *Substations* shall mean any electrical facility to convert electricity produced by wind turbines to a voltage greater than 34,500 volts (34.5 kV) for interconnection with high voltage transmission lines.

12. *Total Height* shall mean the highest point, above ground level, reached by a rotor tip or any other part of the Wind Energy Conversion System.

13. *Tower* shall mean the vertical structures that support the electrical, rotor blades, or meteorological equipment.

14. *Tower Height* shall mean the total height of the Wind Energy Conversion System from grade to the center of the hub.

15. *Transmission Line* shall mean the electrical power lines that carry voltages of at least 69,000 volts (69 KV) and are primarily used to carry electric energy over medium to long distances rather than directly interconnecting and supplying electric energy to retail customers.

16. *Wind Energy Conversion System* shall mean an electrical generating facility comprised of one or more wind turbines and accessory facilities, including but not limited to: power

lines, transformers, substations and meteorological towers that operate by converting the kinetic energy of wind into electrical energy. The energy may be used on-site or distributed into the electrical grid.

17. *Wind Turbines* shall mean any piece of electrical generating equipment that converts the kinetic energy of blowing wind into electrical energy using airfoils or similar devices to capture the wind.

28.3.3 Application Requirements

Commercial/Utility Grade wind energy systems shall be permitted as a Conditional Use within any district where the use is listed and allowed. The following requirements and information shall be met and supplied:

1. The name(s) of the project applicant.

2. The name of the project owner.

3. The legal description and address of the project.

4. 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 interconnecting with the feeder lines. If this information is not presently determined at the time of application, a project may indicate the currently targeted turbine model and quantity.

5. Site layout, including the location of property lines, wind turbines, electrical grid, and all related accessory structures. This site layout shall include distances and be drawn to scale. It is understood that the site layout may change from the time of this application, however the project will update the application from time to time as the layouts are adjusted.

6. Engineer's or manufacturer's certification that the wind turbines in the project comply with the National Electrical Code.

7. Documentation of land ownership or legal control of the property.

8. The latitude and longitude of individual wind turbines at time of application.

9. A USGS topographical map, or map with similar data, of the property and surrounding area, including any other Wind Energy Conversion System not owned by the applicant, within 1 mile of the proposed Wind Energy Conversion System.

10. Location of designated USFW type III, IV and V wetlands, designated scenic areas, and designated natural areas (including bluffs over 15 feet) within 1,320 feet of the proposed Wind Energy Conversion System.

11. An Acoustical Analysis or wind turbine manufacturer's certificate that certifies that the noise requirements within this regulation can be met.

12. FAA letter of determination of no hazard to air navigation, if available.

13. Location of all known and registered Communication Towers within five miles of the proposed Wind Energy Conversion System.

14. Decommissioning Plan consistent with Section 28.3.6(10).

15. Description of potential impacts on nearby Wind Energy Conversion Systems and wind resources on adjacent properties not owned or leased by the applicant.

16. Environmental study which is reviewed and approved by the Nebraska Games and Parks Commission and the U.S. Fish & Wildlife Service.

28.3.4 Aggregate Projects

1. Aggregate projects may jointly submit a single application and be reviewed under joint proceedings, including notices, public hearings, reviews and as appropriate approvals.
2. Permits may be issued and recorded separately.
3. Aggregate projects will be assessed fees as one project.
4. Setbacks to property lines, not road rights-of way, may be less when adjoining property owners are within the same aggregate project.

28.3.5 Setbacks

All towers shall adhere to the setbacks as measured from the center point of the tower foundation established in the following table:

	Wind Turbine – Non Commercial	WECS Wind Turbine – Commercial/Utility WECS	Meteorological Towers
Property Lines (other than right angle corners)	1.0 times the total height	1.0 times the total height from property lines; however, the setback may be less when two adjoining property owners are within the aggregate project	1.0 times the total height except when two adjoining property owners are within the aggregate project
Human Occupied Dwelling Units (1) (2)	1.0 times the total height	1000' for participant (1), (2) 1/2 mile for non-participant (1),(2)	1.0 times the total height plus applicable building setback
Road Rights-of-Way (3)	1.0 times the total height	Generator blades shall not encroach on the right-of-way. A minimum setback of 150ft shall be deployed beyond registered right-of-way measured from the center line of the road.	1.0 times the total height plus applicable building setback
Other Rights-of-Way	1.0 times the total height	Generator blades shall not encroach on the right-of-way.	1.0 times the total height plus applicable building setback
Public Conservation Lands including Wildlife Management Areas and State Recreation Areas including the Garden County Refuge, Crescent Lake National Wildlife Refuge & the Clear Creek Wildlife Management Area	Applicable building setback	4.50 miles from the nearest boundary line	4.5 miles from the nearest boundary line
Other structures not on the applicant's project site	NA	1.0 times the total height	1.0 times the total height
River Bluffs of over 15 feet		1.0 times the total height	
Nearest Bank of the North Platte River	NA	4.5 miles plus 110 yards from the nearest bank of the river	4.5 miles plus 110 yards from the nearest bank of the river

(1) The setback for dwelling units shall be reciprocal in that no dwelling unit shall be constructed within the same distance required for a commercial/utility Wind Energy Conversion System. The project will not be liable for any construction of dwelling units after the project has entered into construction.

(2) An easement between a landowner and a WECS developer reducing the setback distance between a turbine and a residence, is allowed through petition and approval of the County Board of Adjustments.

(3) The setback shall be measured from any future Rights-of-Way as provided by the County at the time of permit application.

28.3.6 Special Safety and Design Standards

All towers shall adhere to the following safety and design standards:

1. Clearance of rotor blades or airfoils must maintain a minimum of 12 feet of clearance between their lowest point and the ground for Small Wind Energy Systems. Clearance of rotor blades or airfoils must maintain a minimum of 50 feet of clearance between their lowest point and the ground for Commercial/Utility Grade Wind Energy Systems.

2. All Commercial/Utility WECS shall have a sign or signs posted on the tower, transformer and substation, warning of high voltage. Other signs shall be posted on the turbine with emergency contact information.

3. All wind turbines, which are a part of a commercial/utility WECS, shall be installed with tubular, monopole type tower.

4. Consideration shall be given to painted aviation warnings on all towers less than 200 feet.

5. Color and finish:
   All wind turbines and towers that are part of a commercial/utility WECS shall be white, grey, or another non-obtrusive color. Finishes shall be matte or non-reflective.

6. Lighting:
   Lighting, including lighting intensity and frequency of strobe, shall adhere to but not exceed requirements established by the FAA regulations. If required by FAA red strobe lights shall be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds. Red pulsating incandescent lights should be avoided. Any lighting requirement updates provided by the FAA will supersede this agreement.

7. Other signage:
   All other signage shall comply with the sign regulations found in the Garden County Zoning regulations.

8. Feeder Lines:
   All communications and feeder lines installed as part of a WECS shall be buried, where practicable.

9. Waste Disposal:
   Solid and Hazardous wastes, including but not limited to crates, packaging materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site promptly and disposed of in accordance with all applicable local, state and federal rules and regulations.

10. Discontinuation and Decommissioning;
    A WECS shall be considered discontinued after one year without energy production, unless a plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the WECS to service or unless non-production is caused by an event of Force Majeure. All WECS and accessory facilities shall be removed to six (6) feet below ground level within 365 days of the discontinuation of use. This period may be extended by the Zoning Administrator following a written request by an agent or the owner of the WECS.

    Each Commercial/Utility WECS shall have a Decommissioning plan outlining the anticipated means and cost of removing WECS at the end of their serviceable life or upon being discontinued and returning the roads to pre-construction or better condition. The cost estimates shall be made by a competent party; such as a

Professional Engineer, a contractor capable of decommissioning or a person with suitable expertise or experience with decommissioning. The plan shall also identify the financial resources that will be available to pay for decommissioning and removal of the WECS and accessory facilities. Financial assurance in an amount sufficient to perform the required decommissioning per this plan will be required. Decommissioning cost estimates will be evaluated no less than every 5 years by a competent party by the project owner.

The Facility Owner or Operator shall post and maintain Decommissioning Funds in an amount equal to current Total Decommissioning Costs. The Decommissioning Funds shall be posted and maintained with a bonding company or Federal or State of Nebraska chartered lending institution chosen by the Facility Owner or Operator and participating landowner posting the financial security, provided that the bonding company or lending institution is authorized to conduct such business within the State of Nebraska and is approved by the County.

11. Shadow/Flicker

If a turbine is sited within ½ mile of a human occupied dwelling unit, a flicker study needs to be submitted in order to obtain a conditional use permit. Each study will contain the following input:

- Turbine location (latitude and longitude)
- Shadow Flicker receptor (dwelling) locations (latitude and longitude)
- U.S. Geological Survey (USGS) 1:24,000 topographic scale and USGS Digital Elevation Model (DEM) (height contours)
- Turbine rotor diameter
- Turbine hub height
- Wind speed and direction frequency distribution data
- Sunshine hours (long term monthly reference data)
- Identification of the model and turbine size

Output from the model must include the following information:

- Calculated shadow-flicker time at selected receptors
- Tabulated and plotted time of day with shadow flicker at selected receptors
- Map showing turbine locations, selected shadow-flicker receptors and iso-line contours indications projected shadow-flicker time (hours per year).

If a turbine model change occurs after the completion and submission of the shadow/flicker study, a new study will not be necessary should the turbine remain at the same or smaller tip height and diameter. Any applicable certifications or materials provided by a turbine manufacturer that satisfactorily meet the requirements set forth above shall substitute for a formal study.

The Shadow Flicker study must indicate shadow flicker will be limited to no more than 30 minutes per day, or 30 hours per year on any human occupied dwelling unit.

12. Noise:
    No Commercial/Utility WECS shall produce noise levels that exceed 45 dBA, or the ambient sound pressure level plus five (5) dBA, whichever is greater at the nearest non-participating structure occupied by humans, applying commonly accepted measurement instruments and standards. Exception: a Commercial/Utility WECS may exceed 45 dBA during periods of severe weather as defined by the US Weather Service.

13. Noise assessment study:
    When a wind turbine is proposed within ½ mile from an occupied residence, a two week noise assessment study conducted by a qualified professional shall be required. That noise study then needs to be submitted in order to obtain a conditional use permit. Each study shall contain the following information:
        1. An estimation or survey of the existing ambient background noise levels.
        2. Prediction (or measurement) of noise levels from the turbine(s) at and near the occupied residence.
        3. Identification of the model and turbine size for sound propagation (sound modeling software shall include a propagation model.)
        4. Comparing calculated sound pressure levels from the wind turbines with the background sound pressure levels at the locations of concern.

    If a turbine model change occurs after the completion and submission of a noise assessment study, a new study will not be necessary should the turbine remain at the same or smaller tip height and diameter. Any applicable certifications or materials provided by a turbine manufacturer that satisfactorily meet the requirements set forth above shall substitute for a formal study.

14. Interference:
    Any Wind Energy Conversion System or component thereof, shall not interfere with any existing electromagnetic communications, such as radio, telephone, or television signals. The applicant shall notify all registered communication tower operators within (5) five miles of the proposed WECS location upon application to the county for permits, and shall provide the contact list to the county zoning authority.

15. Roads:
    Applicants shall:
    A. The applicant shall be responsible for immediate repair of damage to the public roads stemming from construction, operation or maintenance of the WECS.

    B. Identify all county, municipal or township roads to be used for the purpose of transporting WECS, substation parts, cement, and/or equipment for construction, operation or maintenance of the WECS and obtain applicable weight and size permits from the impacted jurisdictions prior to transportation of materials and equipment. The County agrees to assist the project in identifying such roads. Any re-construction, construction, or any other alterations to any road, bridge, driveway or right-of-way, or any other portion of any public road, shall be at the expense of the applicant.

    C. Conduct a pre-construction survey, in coordination with the appropriate jurisdictions to determine existing road conditions. The survey shall include photographs or video and a written agreement to document the condition of the public facility.

    D. Be responsible for restoring the county-owned or maintained road(s) and bridges to preconstruction or better conditions.

E. Conduct a post-construction survey, in coordination with the appropriate jurisdictions to determine whether road conditions have been restored to pre-construction conditions as determined by the Garden County Road Superintendent.

16. Drainage System:
    The applicant shall be responsible for immediate repair of damage to public drainage systems stemming from construction, operation or maintenance of the WECS.

17. Public Inquiries & Complaints:
    Should an aggrieved property owner allege that the WECS is not in compliance with the noise, shadow flicker or any other requirements of this Regulation, the procedure shall be as follows:
    A. If any adjacent land owner has reasonable evidence that a WECS owner is not in compliance with the Zoning Regulations, the land owner may notify the Zoning Administrator in writing.
    B. The Zoning Administrator shall notify the WECS owner of the complaint. The WECS owner shall have sixty (60) days from notification to prove to the Zoning Administrator the project is not out of compliance.
    C. Testing shall be conducted by a qualified, independent, 3rd party testing company approved by the Zoning Administrator.
    D. In the case of a noise assessment study, the study must meet the standards outlined in Section 28.3.6 #13 of these regulations.
    E. In the case of a shadow flicker assessment, the study must meet the standards outlined in Section 28.3.6 #11 of these regulations.

28.3.8 Minimum Regulations/Requirements

These regulations shall serve as minimum requirements for WECS applications. The County Board of Commissioners may require additional information and/or place additional conditions or requirements prior to approval of a Conditional Use Permit. Requirements for Conditional Use Permits are outlined in Section 19 of the Garden County Zoning Regulations.

28.3.9 Fees

Permit Fees:
Fees for WECS shall be established by the County Board of Commissioners.