



Memorandum

TO: Alganssee Township Board

FROM: Christopher Khorey, AICP

SUBJECT: **Draft Updated Wind Energy Ordinance**

DATE: July 28, 2021

On the following pages, please find the proposed revised Wind Energy Ordinance, as recommended by the Planning Commission on July 27.

Under this Ordinance, Small-Scale/On-Site Wind Turbines would be subject to the following limitations:

- Special Use Permit Required
- Only Permitted in the C-1, I-1, and AG Districts
- Prohibited on Lots Under 1 Acre in Area
- Height Limit of 120 feet (80 feet on lots under 2 acres in area)

Utility-Scale Wind Turbines (Wind Farms) would be subject to the following limitations:

- Special Use Permit Required
- Only Permitted in the AG District
- Prohibited on Lots Under 5 Acres in Area
- Must be at least 2,500 feet from a river or lake
- Must be at least 2,500 feet from an R-1, R-2, or R-3 Zoning District
- Must be on a lot with access to a County Primary Road
- Height Limit of 330 feet

The proposed ordinance also contains regulations on setbacks, noise, shadow flicker, safety, and other operational concerns. It further contains a requirement for the submission of a performance bond for decommissioning and a complain resolution system in the event a turbine is out of compliance with the operational requirements.



ALGANSEE TOWNSHIP, BRANCH COUNTY, MICHIGAN

ORDINANCE NO. _____

AN ORDINANCE TO UPDATE THE ZONING REGULATIONS FOR WIND ENERGY FACILITIES.

ALGANSEE TOWNSHIP ORDAINS:

SECTION I. Ordinance Amendment.

Pursuant to this Ordinance, the Zoning Ordinance of the Algansee Township shall be amended as follows:

A new Section 4.03.Q shall be created, including the following text:

Q. Wind energy conversion systems subject to the standards in Section 14.12.

A new Section 8.03.G shall be created, including the following text:

G. On-site wind energy conversion systems subject to the standards in Section 14.12.

A new Section 9.03.G shall be created, including the following text:

H. On-site wind energy conversion systems subject to the standards in Section 14.12.

Section 14.12 shall be removed and replaced by the following text:

- A. **Purpose.** The regulation of Wind Energy Conversion Systems (WECS), including the height, minimum lot area, and required setbacks for such systems, is intended to provide for an alternative source of power generation while protecting the health, safety, and welfare of Township residents. The system, its construction, and its operation shall comply with all applicable local, state, and federal regulations.
- B. **Definition.** WECS: A system which converts wind energy into electricity through the use of a wind turbine generator and includes the turbine, blades, and tower as well as related equipment.
1. **Ambient:** The decibel measurement (dB(A) or dB(C)) of background sound pressure level exceeded 90% of the time at a given location prior to the installation of the WECS (also known as L_{90}).
 2. **dB(A):** The sound pressure level in decibels. It refers to the “a” weighted scale defined by ANSI S1.32 (1997 or most recent) for sound frequencies below the 1,000 HZ octave band.
 3. **dB(C):** The sound pressure level in decibels. It refers to the “c” weighted scale defined by ANSI S1.32 (1997 or more recent) for acoustic energy from the 20HZ octave band and higher.



4. **Decibel:** The unit of measure used to express the magnitude of sound pressure and sound intensity.
5. **FAA:** The Federal Aviation Administration
6. **IEC:** The International Electrotechnical Commission
7. **ISO:** The International Organization for Standardization
8. **Large Turbine/ Utility-Scale Wind Energy Conversion System:** A wind energy conversion system intended to generate power from wind primarily to supplement the greater electric utility grid. Utility-Scale WECS include accessory uses such as, but not limited to, SCADA towers, anemometers, or electric substations.
9. **LMax (LAMax or LCMaX):** The maximum dB(A) or DB(C) sound level measured using the “fast response” setting of the sound meter (equivalent to 0.125 second exponential averaging time).
10. **Lease Unit Boundary:** The boundary around a property(ies) leased or purchased for purposes of operating a wind energy facility, including leased or purchased adjacent parcels to the parcel on which the wind energy facility tower or equipment is located. For purposes of setback, the Lease Unit Boundary shall not cross road rights-of-way.
11. **Met Tower.** A freestanding tower containing instrumentation such as anemometers that is designed to provide present moment wind data for use by the supervisory control and data acquisition (SCADA) system which is an accessory land use to a Utility Grid Wind Energy Conversion System.
12. **Participating and Non-Participating Parcels:**
 - a. Participating Parcel shall mean a parcel of record that is to be used, occupied, maintained, let, leased or authorized to be used for any purposes of developing or operating a WECS, including construction of improvements, providing access to improvements, providing space for collection or distribution lines, or to meet requirements and regulations set forth herein.
 - b. Non-Participating Parcel shall mean a parcel of record that is not a Participating Parcel.
13. **Shadow Flicker:** Alternating changes in light intensity caused by the moving blade of a Wind Energy Conversion System casting shadows on the ground and stationary objects, such as but not limited to a window of a dwelling.
14. **Small Turbine/On-Site Wind Energy Conversion System:** A wind energy conversion system more than 40 feet in height intended to generate electric power from wind solely for the use of the site on which the system is located. WECS primarily intended to provide on-site power, but contribute surplus energy to the grid, may also be considered On-Site WECS.
15. **Wind Energy Conversion System (WECS):** Shall mean a combination of:



- a. A surface area (typically a blade, rotor, or similar device), either variable or fixed, for utilizing the wind for electrical powers; and
- b. A shaft, gearing, belt, or coupling utilized to convert the rotation of the surface area into a form suitable for driving a generator, alternator, or other electricity-producing device; and
- c. The generator, alternator, or other device to convert the mechanical energy of the surface area into electrical energy; and
- d. The tower, pylon, or other structure upon which any, all or some combination of the above are mounted.
- e. Other components not listed above but associated with the normal construction, operation, and maintenance of a WECS such as substations, anemometer towers (MET), cables and wires and other buildings accessory to such facility.

16. **Wind Energy Facility:** Clusters of two or more Utility Grid Wind Energy Conversion Systems, placed upon a lot or parcel with the intent to sell or provide electricity to a site or location other than the premises upon which the Wind Energy Conversion Systems are located. Said Wind Energy Conversion Systems may or may not be owned by the owner of the property upon which they are placed.

C. **Special use permit.** Due to the concerns related to health, safety, and welfare and the increased potential for impacts on adjacent properties, both the WECS and the Met tower shall be permitted upon approval of a Special Use Permit, provided the land area is sufficient to support their development and operation (see subsection D.2 below). The following requirements shall be met and the Planning Commission may impose additional conditions where appropriate:

1. In addition to the requirements for Special Use Permits (Article 18) and Site Plan Review (Article 17), the application for the WECS and/or a Met tower shall include the following additional information:
 - a. the location of overhead electrical transmission or distribution lines, whether utilized or not
 - b. the location of the WECS with its specific dimensions, including the entire area through which the rotor(s) may rotate and/or the location of the Met tower with its specific dimensions
 - c. the location of any guy wires, other support devices, or accessory structures or facilities
 - d. the location of all structures and land uses (including dwelling units) within 500 feet of the WECS and/or Met tower
 - e. proof of the applicant's public liability insurance for the project



- f. the name, address, and telephone number of the owner(s) of the proposed system
 - g. manufacturer's name and address
 - h. survival wind speed in miles per hour and meters per second for the tower and the maximum power output for the generator
 - i. name, address, and telephone number of the installer
 - j. name, address, and telephone number of the person responsible for maintenance
 - k. the height of the WECS and/or Met tower, as described in paragraph D.1 below
 - l. the setbacks from the wind turbine and/or Met tower and any accessory components (structure, guy wires, etc.) to the adjacent property lines
2. **Electromagnetic Interference:** The entire WECS (including turbines, alternators, generators, and interconnect systems) and/or Met tower shall be located, designed, and filtered and/or shielded to prevent the emission of generated radio frequency energy which would cause any interference with radio, television broadcasting, wireless telephone, and/or personal communication transmission or reception, and shall comply with all applicable state and federal rules and regulations.
3. **Noise:** The maximum level of noise permitted to be generated by any WECS and/or Met tower shall be 55 decibels, as measured on the db(A) scale, measured at the property line nearest the WECS or Met tower.
- a. **Third Party Report (Utility Grids WECS ONLY)** For Utility Grid WECS, a copy of a noise modeling and analysis report completed by a third-party acoustician acceptable to the Township shall show locations of equipment identified as a source of noise which is placed, based on the analysis, so that the Utility Grid WECS shall not exceed the maximum permitted noise levels. The noise modeling and analysis shall conform to the most current protocol for The International Electrotechnical Commission (IEC) 61400, Parts 11 and 14, The International Organization for Standardization (ISO) 9613-2, and ANSI S12.62, including all tolerances and uncertainties. After installation of the WECS, noise level measurements shall be performed by a third party, acoustician acceptable to the Township according to the procedures in the most current version of The American National Standards Institute (ANSI) S12.9, Part 3 and ANSI S12.100 for measurements (with an observer). All sound pressure levels shall be measured with a sound meter that meets or exceeds the most current version of ANSI S1.4 specifications for a Type II sound meter. Documentation of the actual noise level measurements shall be provided directly to Alganssee Township (not via the applicant, owner, or operator) within 60 days of the commercial operation of the project and as requested to respond to a noise complaint from a resident. The Township may revoke the special use permit for a particular property and cause the removal of the offending wind turbine due to repeated and verified lack of compliance with noise regulations.
4. **Visual Impact:** Both wind turbines and Met towers shall use tubular towers and shall be finished in a single, non-reflective, matte-finished color. A Met tower shall also be permitted to be of a



lattice-type design. Multiple towers involved in a “large turbine/utility grid” WECS shall be constructed of similar design, size, operation, and appearance throughout the project. No lettering, company insignia, advertising, or graphics shall be on any part of the tower, hub, or blades. Accessory structures may have lettering that exhibits the manufacturer’s and/or owner’s identification.

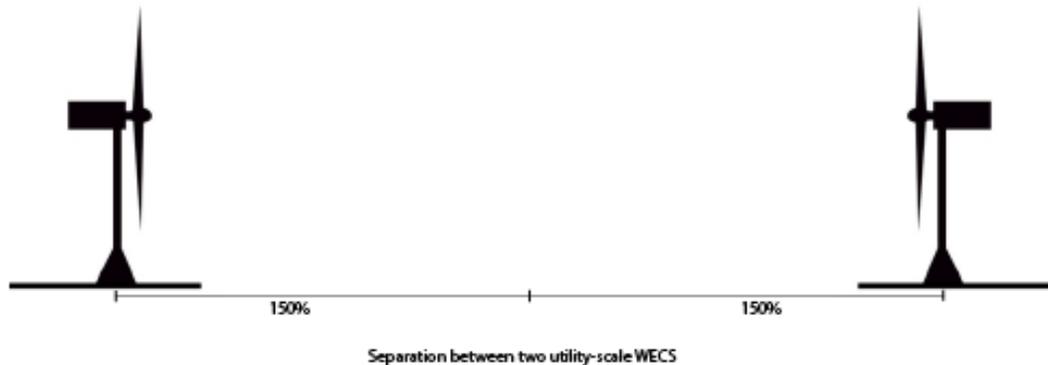
D. Site development.

1. **Height:** The height of the wind turbine shall be measured from the existing grade at the base of the turbine to the top of the blade or rotor at its tallest point. The height of the Met tower shall be measured from the existing grade at the base of the tower to the top of the unit at its tallest point.
 - a. The maximum allowable height for any "small turbine/on-site" WECS, based upon the combined tower and rotor blade length, shall be 40 feet for site parcels of one to less than two acres, 80 feet for site parcels of two to less than three acres and up to 120 feet for site parcels of three acres or more.
 - b. The maximum allowable height for any "large turbine/utility grid" WECS, based upon the combined tower and rotor blade length, shall be 330 feet. The Planning Commission, in consideration of a request, may approve an increase to this height requirement where the following requirements are met:
 - c. A WECS located in proximity to an airport may be subject to additional height limitations as provided in the airport’s layout or approach plan.
 - d. The maximum allowable height for a Met tower and applicable height requirements shall be the same as for a WECS as indicated in Subsection b above depending on the size of the parcel and the intended type of WECS.
2. **Zoning District:**
 - a. A “small turbine / on-site” WECS or associated Met tower shall be permitted in the AG, C-1, or I-1 Districts upon approval of a Special Use Permit, provided it complies with the requirements of this section and the zoning district.
 - b. A “large turbine / utility grid” WECS or associated Met tower shall be permitted with the AG District upon approval of a Special Use Permit provided it complies with the requirements of this section and the zoning district.
3. **Lot area/setbacks:**
 - a. No "large turbine/utility grid" WECS or associated Met tower shall be erected on any parcel that does not have direct access to a County Primary Road.
 - b. No "small turbine/on-site" WECS or associated Met tower shall be erected on any lot or parcel less than one acre in area and shall be situated on the lot or parcel so that no



portion of the tower or turbine is closer to property lines (excluding public utilities) than 150 percent of the height of the tower or turbine as defined in subparagraph D.1 above.

- c. No "large turbine/utility grid" WECS or associated Met tower shall be erected on any parcel less than five acres in area and shall be situated on the parcel so that no portion of the tower or turbine is closer to property lines (excluding public utilities) than 150 percent of the height of any tower or turbine as defined in subparagraph D.1 above.
- d. On sites where multiple turbines or towers are proposed, sufficient land shall be available such that the minimum land area requirement may be satisfied on the site for each proposed unit.
- e. Guy wires or other elements of the support structure shall not extend closer than ten feet to the owner's property lines.
- f. Accessory structures or other accessory equipment used in the function of the WECS and/or Met tower shall satisfy the setback requirements of the subject zoning district.
- g. **Setback from Bodies of Water:** No "large turbine/utility grid" WECS or associated Met tower shall be erected within 2,500 feet of the Ordinary High Water Mark of a river or inland lake regulated by Michigan Department of Environmental Quality. Any "small turbine/on-site" WECS within 2,500 feet of the Ordinary High Water Mark of a river or inland lake regulated by Michigan Department of Environmental Quality shall be no more than 40 feet in height.
- h. **Setback from Residential Zoning Districts:** No "large turbine/utility grid" WECS or associated Met tower shall be erected within 2,500 feet of an R-1 or R-2 Zoning District.
- i. **Tower Separation.** Turbine/tower separation shall be no less than 150% the height of both towers including the top of the bladed in their vertical position.



- 4. **Ground Clearance:** For both horizontal and vertical axis turbines, the WECS rotor shall be located on the tower or support such that the minimum blade clearance above ground level is 20 feet.



5. **Safety.** The WECS shall meet the following safety requirements:
 - a. The WECS shall be designed to prevent unauthorized access to electrical and mechanical components and shall have access doors that are kept securely locked at all times when service personnel are not present.
 - b. All spent lubricants and cooling fluids shall be properly and safely removed in a timely manner from the site of the WECS.
 - c. A sign shall be posted near the tower or operations and maintenance office building that shall contain emergency contact information. Signage placed at the road access shall be used to warn visitors about the potential danger of falling ice.
 - d. All collection system wiring shall comply with all applicable safety and stray voltage standards.
 - e. WECS towers shall not be climbable on the exterior.
 - f. Each WECS shall be equipped with both a manual and automatic braking device capable of stopping the WECS operation in high winds within 80% of design limits of the breaking system.
 - g. A copy of the un-redacted Safety Manual from the turbine manufacturer shall be submitted to the Township and the turbine must comply with all requirements therein.
 - h. A copy of the ongoing maintenance plan for the WECS shall be submitted to the Township and the WECS owner must execute the maintenance plan as written.
6. **Connection to power grid:** If the WECS is to be interconnected with the power grid of the local electric utility, the applicant shall provide proof of written notice to the utility of the proposed interconnection and the utility's response thereto. The owner shall comply with all requirements of the servicing utility if the WECS is interfaced with the utility grid. The utility will install appropriate electric metering (for sellback or non-sellback) and the owner will be required to install a disconnecting device adjacent to the electric meter(s). All transmission lines located on participating parcels shall be underground.
7. **Lighting:** The WECS and/or Met tower shall be lighted in compliance with the minimum requirements of the Federal Aviation Administration (FAA).
8. **Vibration:** Under no circumstances shall a WECS or Met tower produce vibrations humanly perceptible beyond lot boundaries.
9. **Shadow Flicker.**
 - a. **Utility Grid WECS.** No amount of Shadow Flicker may fall on or in a Non-Participating Parcel. Site plan and other documents and drawings shall show mitigation measures to eliminate potential impacts from shadow flicker, as identified in the Shadow Flicker Impact Analysis. Measures to eliminate all



effects of shadow flicker on all Non-Participating parcels beginning at the property lines, such as programming the WECS to stop rotating during times when shadow crosses occupied structures, shall be required. If the Shadow Flicker Impact Analysis shows potential for shadow flicker to fall on any Non-Participating Parcel and the affected property owners wishes to waive his/her rights to the protections provided by this Ordinance, the property owner shall submit for records a signed and notarized letter of acknowledgement that verifies the owner's understanding that shadow flicker on his/her parcel may result from installation and waives the Township requirement for no shadow flicker on the Non-Participating Parcel. If the affected property owner wants this waiver to apply to future owners of the affected property, the signed and notarized letter of acknowledgment must be recorded with the Branch County Register of Deeds.

- b. **On Site WECS.** Provided that all setback requirements are met, On Site WECS shall not be subject to shadow flicker regulations.

- 10. **Additional studies:** The applicant may offer and submit, or the Planning Commission may require, that the applicant submit studies related to noise, vibration, environmental impacts, or similar issues that may be considered a nuisance. In addition, such studies may include avian and wildlife impact, visual impacts, or similar issues based upon compatibility of the proposed use in the requested location.

- E. **Annual Report.** All owners of utility grid WECS within the Township shall submit an annual report to the Zoning Administrator. The responsibility for the annual report shall lie with the owner of the WECS, not the owner of the land the WECS is located on, and the owner of the WECS shall be responsible for all costs associated with the annual report. The annual report must contain reports from a qualified third party detailing the condition of the WECS, any needed maintenance or safety improvements, and the actual performance of the WECS with regard to noise, shadow flicker, and electro-magnetic interference.

F. Decommissioning.

- 1. The Planning Commission shall require a performance bond to guarantee all aspects of the wind energy facility are removed if the wind turbines are decommissioned. To determine the amount of the performance bond, the applicant shall provide three estimates, from outside contractors, for the removal of all aspects of the wind energy system, and the performance bond shall be equal to the highest estimate. Every three years, the wind energy system owner shall submit three new estimates to the Township, and the bond shall reflect the highest of the newly submitted estimates.
- 2. All above and below ground materials shall be removed when the WECS is decommissioned. All decommissioned materials shall be removed from Algansee Township.
- 3. The ground shall be restored to its original condition within 60 days of removal of the structures. Acceptable ground covers include grasses, trees, crops, or other material demonstrated to be characteristic of the surrounding land.



4. In the event that the WECS owner or operator fails to comply with the decommissioning requirements of this Ordinance, the Township may, upon thirty (30) days written notice to the WECS owner and/or operator, utilize the security bond referenced in Section 17(i) to complete the decommissioning process.

G. **Abandonment of unused turbines.** Abandoned or unused turbines and associated facilities shall be removed within 12 months of the cessation of operations at the site unless a time extension is approved by the Planning Commission. A copy of the relevant documents (including the signed lease, deed, license, or land contract) which allows the installation and which requires the applicant to remove the turbine and associated facilities upon cessation of operations shall be submitted at the time of application. In the event that a turbine is not removed within the 12 months of the cessation of operations at a site, the turbine and facilities shall be removed by the Township through the use of the decommissioning bond.

H. **Complaint Resolution.** The purpose of this section is to provide the public with a mechanism to file a complaint with the Zoning Administrator regarding a WECS, and receive a timely response regarding alleged ordinance violations or violations of the Conditions of Approval.

1. Upon receiving a complaint of an alleged Ordinance or Conditions of Approval violation, the Zoning Administrator shall notify the owner and operator of the WECS, and, if they are separate entities, the owner of the lot in question.
2. Upon notification by the Zoning Administrator, the WECS owner and operator (meaning the owner of the turbine and related equipment, not the land owner) shall have 60 days to investigate the complaint, and respond with either a mitigation plan or a statement requesting that the matter be reviewed by the Zoning Board of Appeals. If the WECS owner and operator believes that the WECS is not in violation, it shall request a review by the Zoning Board of Appeals.
 - i. If the WECS owner and operator does not respond within 60 days, the Zoning Administrator shall notice a public hearing at the Planning Commission for the purpose of discussing a revocation of the Special Land Use Permit. The Special Use owner and operator shall be notified of the hearing. If the Special Use owner and operator responds to the complaint prior to the hearing date, the hearing shall be cancelled.
 - ii. If the WECS owner and operator submits a mitigation plan, the Zoning Administrator shall review it and determine if it is satisfactory to mitigate the complaint.
 1. The Zoning Administrator may consult outside experts, the Township Attorney, or the Township Planner, in making a determination.
 2. If the mitigation plan is determined to be satisfactory, the WECS owner and operator must implement the mitigation within 30 days. The Zoning Administrator may extend the deadline upon determining that is not practical for the mitigation to be accomplished in 30 days due to circumstances beyond the applicant's control.
 3. If the WECS owner and operator fails to implement the mitigation plan, the



Zoning Administrator shall notice a public hearing at the Planning Commission for the purpose of discussing a revocation of the Special Land Use Permit. The Special Use owner and operator shall be notified of the hearing. If the Special Use owner and operator implements the mitigation plan prior to the hearing date, the hearing shall be cancelled.

4. If the WECS owner and operator requests that the Zoning Board of Appeals review the matter, the Zoning Board of Appeals shall hold a public hearing, and shall hear evidence from both the complainant, and the WECS owner and operator. Following the public hearing, the Zoning Board of Appeals shall make one of the following determinations:
 - a. The WECS is in compliance with the Ordinance and all Conditions of Approval, and no further action is needed.
 - b. The WECS is out of compliance with either the Ordinance, or the Conditions of Approval, or both, and the Special Use owner and operator must submit a mitigation plan to the Zoning Administrator within 60 days. If no mitigation plan is submitted, the Zoning Administrator shall notice a public hearing of the Planning Commission for the purpose of revoking the Special Use Permit. If the Special Use permit is revoked, the abandonment process described in 14.12. shall begin.
3. In order to prevent repetitive and unmerited complaints and ensure that all complaints can be addressed efficiently, the following shall apply:
 - i. A complaint may only be lodged by the owner or leaseholder of a parcel of land within one mile of the WECS that the complaint alleges is out of compliance with this Ordinance or its Conditions of Approval.
 - ii. No more than one complaint may be lodged per year per parcel of land. A complaint may allege more than one violation of the Ordinance or Conditions of Approval. An owner of multiple parcels of land may lodge complaints for each parcel of land they own during a given year.
 - iii. If, following a complaint, a WECS has been determined to be in compliance by the Zoning Administrator or Zoning Board of Appeals, no complaint shall be lodged alleging the same violation of the Ordinance or Condition of Approval for one year.
 - iv. Following the implementation of a mitigation plan, no complaint shall be lodged alleging that the mitigation plan has not successfully corrected the violation until at least 90 days have passed after the implementation of the plan.



SECTION 2. Conflicts. If any provision of the Zoning Ordinance conflicts with this amendment to the Zoning Ordinance, the most restrictive provision shall apply.

SECTION 3. Severability. This Ordinance and the various parts, sentences, paragraphs, sections, and clauses thereof are hereby declared to be severable. Should any part, sentence, paragraph, section, or clause be declared unconstitutional, null, or void by a court of competent jurisdiction, such declaration shall not have any effect on the validity of the remaining parts, sentences, paragraphs, sections, and clauses of this Ordinance.

SECTION 4. Effective Date: This Ordinance shall be effective upon publication in a newspaper of general circulation within the Township.

This Ordinance is hereby declared to have been adopted by the Township Board of the Alganssee Township, County of Branch, State of Michigan, at a Regular Meeting, called and held on the _____ day of _____, 2021.

YEAS:
NEAS:
ABSENT:

I hereby approve the foregoing Ordinance.

Ann Gary
Clerk

Russ Jennings
Supervisor

Adopted:
Published:
Effective: