VEHICLE SERVICE STATION: A building and lot or parcel designed or used for the retail sale of fuel, lubricants, air, water or other operating commodities for vehicles, and including customary space and facilities for the installation of such commodities on or in such vehicles and including space for vehicle storage, minor repair and servicing.

WETLANDS: Land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, marsh, or other areas such as flood plains or environmental areas designated as such in the County Comprehensive Plan or other county, state, or federal documents.

WIND TURBINE GENERATOR (WTG): A tower, pylon, or other structure, and any, all, or some combination of the following:

1. A wind vane, blade, or series of wind vanes or blades, or other devices mounted on a rotor for the purpose of converting wind into electrical or mechanical energy.
2. A shaft, gear, belt, or coupling device used to connect the rotor to a generator, alternator, or other electrical or mechanical energy producing device.
3. A generator, alternator, or other device used to convert the energy created by the rotation of the rotor into electrical or mechanical energy.

WIND TURBINE GENERATOR HEIGHT: The distance between the ground and the highest point of the wind turbine generator, regardless whether that point is on a fixed or mobile part of the wind turbine generator.

WIND TURBINE GENERATOR- BUILDING-MOUNTED: An on-site Wind Turbine Generator (WTG) used to generate electricity or produce mechanical energy for use on the property where it is located and attached to the building's roof, walls, or other elevated surface. The height of the WTG — BUILDING-MOUNTED does not exceed 15 feet as measured from the highest point of the roof, excluding chimneys, antennae, and similar protuberances. Sale of electric power via net metering is permitted per applicable state law.

WIND TURBINE GENERATOR - LARGE: A commercial Wind Turbine Generator (WTG) used to generate and provide electricity to the electric utility grid. It may include nearby accessory facilities necessary to supply and transfer the electricity to the utility grid. These WTGs are greater than 120 feet in height and may not exceed 400 feet, as provided in Section 18.47.

WIND TURBINE GENERATOR — MEDIUM: An on-site Wind Turbine Generator (WTG) used to generate electricity or produce mechanical energy for use on the property where it is located having a height of greater than 60 feet but less than or equal to 120 feet. Sale of electric power via net metering is permitted per applicable state law.

WIND TURBINE GENERATOR — SMALL: An on-site Wind Turbine Generator (WTG) used to generate electricity or produce mechanical energy for use on the property where it is located having a height of 60 feet or less. Sale of electric power via net metering is permitted per applicable state law.

YARDS: The open spaces on the same lot with a main building, unoccupied and unobstructed from the ground upward except as otherwise provided in this Ordinance, and as defined herein:

YARD - FRONT: An open space extending the full width of the lot the depth of which meets the setback requirements of the zoning district. See Setback

Corner Lots: Shall provide front yard setbacks on all streets, frontages, or future road easements that have or may potentially have adjacent lots fronting on the same street (or across there from).

YARD - REAR: An open space extending the full width of the lot, the depth of which meets the setback requirements of the zoning district. In the case of a corner lot, the rear yard may be opposite either street frontage. See Setback

YARD - SIDE: An open space which meets the setback requirements of the zoning district, extending from the front yard to the rear yard. See Setback

SECTION 18. 47. WIND GENERATION

The purpose of this section is to establish requirements for the location of Wind Turbine Generators (WTG), commonly known as wind turbines or windmills, and anemometer towers. The county recognizes that it is in the public interest to permit the location of wind turbine generators within the county. The county also recognizes the need to protect the scenic beauty of Otsego County from unnecessary and unreasonable visual interference. As such, this ordinance seeks to:

a. Regulate the development of renewable energy resources in a prudent manner.

b. Protect all areas of the County from any potential adverse impacts of WTG and anemometer towers;

c. Regulate the location of WTG and anemometer towers in the County;

d. Protect the public health, safety and welfare;

e. Avoid potential damage to adjacent property from the failure of WTG and anemometer towers.

18.47.1 ZONING DISTRICT LOCATIONS

a. Large WTGs: Permitted Subject to Special Conditions in AR, FR.
b. Medium WTGs: Permitted as an Accessory Use Subject to Special Conditions in AR, FR, I.
c. Small WTGs: Permitted as an accessory use to an allowed Principal Use in the AR, FR & R3 Zoning Districts. A special use permit is required in all other zoning districts.
d. WTG — Building-Mounted: Permitted as an accessory use to an allowed Principal Use in all districts.

18.47.2 WIND TURBINE GENERATOR— BUILDING MOUNTED.

a. Zoning District: Permitted as an accessory use to an allowed Principal Permitted Use in all zoning districts.
b. Height: The height of the WTG – BUILDING-MOUNTED shall not exceed 15 feet as measured from the highest point of the roof, excluding chimneys, antennae, and similar protuberances.
c. Setback: Shall be no closer than the minimum specified in Article 14. If guy wires are used, their anchors may not be closer than the minimum setback specified in Article 14.
d. Quantity of Units: Up to three Building-Mounted WTGs may be permitted on any single ownership parcel. One to three Building-Mounted WTGs may be mounted on a single building provided other stipulations are met. No WTG shall be sited closer than the height of the taller WTG from its base to the base of an adjacent WTG. For this purpose the base of a Building-Mounted WTG is considered to be the highest point of the roof, excluding chimneys, antennae, and similar protuberances.
e. Sound Pressure Level: Shall not exceed 55 dB(A) at the nearest property line to the WTG. This sound pressure level may be exceeded during short-term events such as utility outages and/or windstorms. If the ambient sound pressure level exceeds 55dB(A), the standard shall be the ambient dB(A).
f. Code Requirements: Must meet all applicable state and local construction and electrical codes.
g. Safety: WTG must have automatic braking, governing, or feathering system to prevent uncontrolled rotation or speeding.

h. Tower: Shall meet or exceed tower specifications provided by the manufacturer of the generator, or have a design approved by a professional engineer licensed in the State of Michigan.

18.47.3 WIND TURBINE GENERATOR — SMALL.

a. Zoning District: Permitted as an accessory use to an allowed Principal Use in the AR, FR & R3 Zoning Districts. A special use permit is required in all other zoning districts.
b. Height: Shall have a WIND TURBINE GENERATOR HEIGHT less than 60 feet.
c. Property Line Setback: Shall not be closer than 1.5 times the WIND TURBINE GENERATOR HEIGHT to the nearest property line from the WTG.
d. Zoning District: Permitted as an Accessory Use Subject to Special Conditions in all zoning districts. In the R1, R2, and R3 districts siting of WTGs – Small must be in the Rear yard.
e. Quantity of Units: A combination of up to three Small WTGs or Building-Mounted WTGs may be permitted on any single ownership parcel. The property line setbacks stated above must be observed. No WTG shall be sited closer than the height of the taller WTG from its base to the base of an adjacent WTG.
f. Sound Pressure Level: Shall not exceed 55 dB(A) at the nearest property line to the WTG. This sound pressure level may be exceeded during short-term events such as utility outages and/or windstorms. If the ambient sound pressure level exceeds 55dB(A), the standard shall be the ambient dB(A).
g. Code Requirements: Must meet all applicable state and local construction and electrical codes.
h. Safety: WTG must have automatic braking, governing, or feathering system to prevent uncontrolled rotation or speeding.
i. Blade clearance: The minimum vertical blade tip clearance from grade shall be 15 feet for a WTG employing a horizontal axis rotor.
j. Tower: Shall be a free-standing monopole that shall meet or exceed tower specifications provided by the manufacturer of the generator, or have a design approved by a professional engineer licensed in the State of Michigan.

18.47.4 WIND TURBINE GENERATOR — MEDIUM.

a. Height: Shall have a WIND TURBINE GENERATOR HEIGHT greater than 60 feet but less than or equal to 120 feet.

b. Setback: Shall not be closer than 1.5 times the WIND TURBINE GENERATOR HEIGHT to the nearest property line from the WTG. If guy wires are permitted, their anchors may not be closer that the minimum setback specified in Article 14.
c. Sound Pressure Level: Shall not exceed 55 Db (A) at the nearest property line to the WTG. This sound pressure level may be exceeded during short-term events such as utility outages and/or windstorms. If the ambient sound pressure level exceeds 55dB (A), the standard shall be the ambient dB (A).
d. Code Requirements: Must meet all applicable state and local construction and electrical codes.
e. Safety: WTG must have automatic braking, governing, or feathering system to prevent uncontrolled rotation or speeding.

f. Blade clearance: The minimum vertical blade tip clearance from grade shall be 20 feet for a WTG employing a horizontal axis rotor.

g. Shall secure zoning and building permits from the Authority having jurisdiction.

18.47.5 WIND TURBINE GENERATOR - LARGE

Application Requirements:

In addition to the application requirements of Article 16 of this ordinance, an application for a special use permit for a commercial or a private WTG or an anemometer tower shall include all of the following information, unless expressly indicated otherwise:

a. A site plan meeting all of the requirements of Article 20 of this Ordinance.

b. A detailed analysis by a professional engineer, licensed in the State of Michigan, describing the specific WTG structure(s) or anemometer tower proposed and all phases for implementing the development in compliance with the standards set forth in Section 18.47.5.

c. A study prepared by a professional engineer, licensed in the State of Michigan, documenting that the site of the WTG has sufficient wind resources for the proposed WTG equipment. Provided, however, this application requirement shall not apply an anemometer tower.

d. A resume' or other written summary of the education, experience, and other qualifications of all experts providing information concerning the WTG or anemometer tower project.

e. An avian study based on U.S. Fish and Wildlife Service, "Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines", Federal Register: July 10, 2003 (Volume 68, Number 132). Provided, however, this application requirement shall not apply to an anemometer tower.

f. Analysis, measurements and projections of WTG noise propagation shall conform to International Electromechanical Commission (IEC) Standard 61400-11 Part 11, as that standard may be amended or updated from time to time. Acoustic Noise Measurement Techniques shall include: optional noise directivity requirements (see below), infrasound (low frequency) projections, low frequency noise (between 20 and 100 Hz) measurement and analysis and impulsivity measurement (noise pressure of potential "thumping" sounds). Analysis shall include but is not limited to:

1. A survey of the existing ambient background noise levels. Analysis shall include day time measurements and also at least two ambient noise measurements between 9:00 PM and 11:59PM and two between 1:00 AM and 5:00AM.

2. A prediction of the WTG noise levels at the property border. This can be made with manufacturer's data or data from a private testing agency for proposed WTGs or by direct measurement for WTGs in place, so long as measurements are conducted according to IEC and 61400-11 part 11 as that standard may be amended or updated from time to time. Including infrasound and low frequency noise between 20 and 100 Hz, modeling must identify likely pure tone sources.

3. Identification and support for a model for sound propagation. The model may be hemispherical or spherical but particular attention must be paid to the noise propagation downwind of the proposed installation site and the propagation of sound at differing atmospheric

densities.

4. A comparison of calculated wind sound pressure levels with and without the WTG or proposed WTGs. This confirms the baseline for permitted sound levels once the WTGs are operating.

This application requirement shall not apply to an anemometer tower.

g. A detailed written statement, with supporting evidence, demonstrating how the proposed WTG or anemometer tower will comply with all of the standards for approval.

h. Written documentation projecting the shadow flicker on any existing structures located off the property on which the WTG will be constructed, and the extent and duration of the shadow flicker on these existing structures. Provided, however, this application requirement shall not apply to an anemometer tower.

i. Written documentation that the applicant has notified the FAA, Gaylord Regional Airport and any other applicable state and federal regulatory agencies of the proposed WTG or anemometer tower.

j. Elevation drawings, computer generated sound models or simulations and other aids or documentation projecting the sound reaching off the property, on which the WTG will be constructed, and the extent and duration of the sound. Provided, however, this application requirement shall not apply to an anemometer tower.

k. Elevation drawings, computer generated photographic simulations and other images, or other visual aids that depict how the WTG tower and all accessory structures will appear as constructed on the proposed site from vantage points north, south, east, and west of the WTG tower. Provided, however, this application requirement shall not apply to an anemometer tower.

18.47.6 Standards for WTG and Anemometer Tower Approval.

The Planning Commission shall approve, or approve with conditions, an application for WTG or an anemometer tower only upon a finding that the proposed WTG or anemometer tower complies with all of the following applicable standards, and the approval standards as found in Article 16 of the Zoning Ordinance.

a. The proposed site shall have documented annual wind resources sufficient for the operation of the proposed WTG. The wind resource documentation shall detail, at a minimum, ambient wind at the maximum height permitted by this ordinance. Lower elevations (consistent with anemometer tower approval) shall also be provided by the applicant. This standard shall not apply to an anemometer tower.

b. The minimum site area for WTG or an anemometer tower shall be as necessary to meet required setbacks and any other standards of this section.

c. Noise permitted from WTGs is governed by the original ambient baseline noise study performed in accordance with Section 18.47.2(f) for the first WTG on the subject property and original fixed noise pressure limits above baseline for both day and night operations.

d. Broadband noise from any WTG shall be limited to no more than 10 decibels above the original ambient baseline sound level (or that level which is exceeded 90% of the time) beyond the

property line, considering both daytime and night measurements as reported in the engineer's sound propagation model required in section 18.2(f). The day and night requirements will be different. The harmonic mean of the night measurements will set the baseline for night noise limits and the harmonic mean of the daytime measurements will set the baseline for daytime limits. Pure tones, defined as an octave band (at any frequency), are limited to no more than 3 decibels above the adjacent higher and lower octave bands.

e. The potential ice throw or ice shedding for the proposed WTG shall not cross the property lines of the site in question nor impinge on any public Right-of-Way or overhead utility line. Compliance shall be demonstrated in the permit application by the specific analysis method but such model shall not alleviate the applicant of the need to comply with this subsection under all atmospheric conditions, for the life of the structure. This standard shall not apply to an anemometer tower.

f. A WTG shall meet a setback from any adjoining lot line and any adjoining public or private road a distance equal to 1.5x (D+H), but setbacks shall not be reduced to less than 1250 feet for a Public WTG and shall not be reduced to less than 180 feet for a Private WTG, where the proposed WTG meets standards c, d, and e above and where D= the diameter of the rotor and H = the height of the rotor axis above the ground at the base of the tower. This standard shall not apply to an anemometer tower.

g. An anemometer tower shall meet a setback from any adjoining lot line and any adjoining public or private road or overhead utility line a distance equal to the 1.5 times the height of the anemometer tower as measured to the highest point. The setback shall be measured from the outermost point on the base of the anemometer tower, not the guide wire or support wires.

h. The maximum wind generation tower height shall be 300 feet for a WTG. The maximum height of an anemometer tower shall be 300 feet. The Planning Commission may approve an increased height for a WTG, not to exceed 400 feet, if the following specific conditions are met along with the general conditions set forth in Section 16.7 of the Zoning Ordinance. The increased height, however, shall be the smallest increase necessary to meet the following conditions:

1. The increased height is necessary for the preservation of a substantial stand of trees, existing land forms or structures that would otherwise be removed to increase wind velocity.
2. To improve the sound model and/or improve compliance with paragraphs 18.47.3(c), (d) or (e).

This standard shall not apply to an anemometer tower.

i. For both horizontal and vertical axis WTG turbines, the rotor shall be located on the tower such that the minimum blade clearance above the ground level is 25 feet for Private WTG in excess of 35 feet in height and 50 feet for WTG.

j. All WTG turbines shall be equipped with controls to limit the rotational speed of the blades within design limits for the specific WTG. This standard shall not apply to an anemometer tower.

k. The on-site electrical transmission lines connecting the WTG to a public utility electricity distribution system shall be located underground. In addition all other utility lines shall be located underground. Provided, however, this standard shall not apply to an anemometer tower.

l. The WTG or anemometer tower shall, subject to any applicable standards of the FAA, be painted a neutral color so as to reduce visual obtrusiveness. Excessively bright or neon colors are

not acceptable. The Planning Commission, however, may approve an alternate color if the WTG or anemometer tower is located within an avian migratory route or if an alternate color would otherwise benefit the neighborhood.

m. The WTG or anemometer tower shall not be artificially lighted unless required, in writing, by the FAA. Where the FAA requires lighting, the lighting shall be the lowest intensity allowable under FAA regulations, the fixtures shall be shielded and directed to the greatest extent possible to minimize glare and visibility from the ground, and no strobe lighting shall be permitted, unless expressly required by the FAA

n. The WTG or anemometer tower shall be designed and constructed in such a manner that access is limited, to the extent possible, to authorize personnel only.

o. The WTG or anemometer tower shall be constructed and operated so that it does not interfere with television, radio, cellular telephone or microwave reception in neighboring areas. If degradation of television, radio, cellular telephone or microwave reception occurs as the result of the WTG or anemometer tower, the developer shall pay to correct the television, radio, and cellular telephone or microwave reception.

p. A WTG shall be a monopole or monotube style construction (as distinguished from a lattice-style tower) and shall not utilize guy wires. A Private WTG or anemometer tower may be a lattice-style tower and may utilize guy wires, providing access limitations are maintained to prevent climbing by unauthorized persons.

q. The WTG or anemometer tower shall have posted on the site in a visible, easily accessible location two signs no more than four (4) square feet in area displaying an address and telephone number for emergency calls. The emergency telephone number shall allow a caller to contact a responsible individual to address emergencies at any time during or after regular business hours and on weekends or holidays. Provided, however, this standard shall not apply to private wind generation. One sign shall be located at the service drive entrance to the WTG at the minimum setback distance.

r. The WTG or anemometer tower shall have no advertising painted on or attached to the tower or any other structure of the WTG.

s. The WTG shall be designed and sited in such a manner to minimize shadow flicker on a roadway. In addition the WTG shall be designed and sited in a manner to prevent shadow flicker on any existing structures located off the property on which the WTG is constructed. It shall be the responsibility of the WTG operator to modify operations to also prevent shadow flicker on dwellings constructed and/or occupied after installation of the WTG. If necessary to prevent shadow flicker from crossing occupied structures the WTG may be programmed to stop rotating during times the WTG shadow crosses these structures. The WTG operator may obtain a written easement or other written agreement which specifically allows shadow flicker to cross an occupied structure.

t. Structural integrity of all components not under the jurisdiction of the Michigan Building Code shall be certified by a professional engineer licensed in the State of Michigan. Certification shall include; verification that ultimate strength exceeds that needed to withstand all factored loads and load combinations specified in SIE/ASCE 7-02 “Minimum Design Loads for Buildings and Other Structures”. First Order Reliability Analysis shall demonstrate a reliability coefficient (Beta) of not less than 3.54 for any failure mode that could result in any portion of the WTG

falling to the ground. In lieu of First Order Reliability Analysis, adequate structural reliability may be demonstrated via analysis methods specified in the Michigan Building Code.

18.47.7 Conditions.

The Planning Commission may attach reasonable conditions to the approval of a WTG or anemometer tower. These conditions may include those necessary to insure that public services and facilities affected by the WTG or anemometer tower will be capable of accommodating increased service and facility loads caused by the WTG or anemometer tower, to protect the natural environment and conserve natural resources and energy, to insure compatibility with adjacent uses of land, and to promote the use of land in a socially and economically desirable manner. Any conditions imposed, however, shall meet all of the following requirements:

h. Be designed to protect natural resources, the health, safety, and welfare and the social and economic well being of those who will use the WTG or anemometer tower under consideration, residents and landowners immediately adjacent to the proposed WTG or anemometer tower, and the community as a whole.

i. Be related to the valid exercise of the police power, and purposes which are affected by the proposed WTG or anemometer tower.

j. Be necessary to meet the intent and purpose of the zoning ordinance, be related to the standards established in the ordinance for the WTG or anemometer tower under consideration, and be necessary to insure compliance with those standards.

18.47.8 Ongoing Compliance.

a. The noise propagation, blade flicker and ice hazard standards developed in permitting of WTGs are absolute. Once WTGs are permitted, the owners have the option of compliance or discontinuation of operations.

b. The owner of a WTG shall conduct physical inspections of the WTG structure(s) and associated equipment annually to ensure continuing compliance with this section and any conditions imposed with the approval of the WTG. Copies of all inspection reports shall be submitted to the zoning administrator within thirty (30) days of the inspection. In the event a WTG owner fails to comply with this Section the County shall have the authority to have the WTG inspected and shall utilize funds from the performance bond to cover the costs of such inspection.

c. Noise exceeding permitted levels. The ordinance recognizes that certain wind and weather conditions and altitude densities can enhance temporary noise pressure that exceeds permitted levels. If non-compliance with the noise standards is brought to the attention of Otsego County enforcement officials the complaint will be investigated and if confirmed, written notice will be sent to the WTG owner requiring post permit documentation of corrective measures taken to address the sound. Documentation could include statements from those adjusting or modifying the WTG and may, at the option of Otsego County, include additional noise propagation certification, conducted in a manner similar to that presented in section 18.47.2(f) tailored to the specific problem being addressed.

18.47.9 Performance Guarantee.

In connection with the approval of a WTG or anemometer tower, the Planning Commission shall require the owner of the WTG to furnish the county with a performance guarantee in the form of a cash deposit, certified check, irrevocable bank letter of credit, or surety bond acceptable to the county in an amount

equal to the estimated costs associated with removal of the WTG or anemometer tower and all associated equipment and accessory structures and restoration of the site to a reusable condition which shall include the removal of all underground structures to a depth of ten feet (10') below the natural ground level at that location.

A detailed cost estimate for the removal of the tower shall be provided with the application and shall be based on Means Construction Estimating Guide or similar accepted pricing schedule and shall not include credit for the salvageable value of any materials.

The amount of the performance guarantee shall be reviewed every five years at the time of the Planning Commission review of the WTG as noted in Section 18.47.8. The amount of the performance guarantee shall be increased based on an inflation rate equal to the average of the previous 10 years Consumer Price Index, but not less than 3.5% per year.

If the performance bond is used to cover costs associated with inspections as noted in Section 18.47.5(b) the owner of the WTG shall immediately insure that the full bond amount is available. Failure by the owner of the WTG to insure that the full bond amount is available shall be a violation of this ordinance.

18.47.10 Removal of WTG and Anemometer Towers

WTG and anemometer towers that are not operated for a continuous period of twelve (12) months shall be removed by the owner of the WTG or anemometer tower within 90 days of receipt of a notice from the county requiring such removal. For purposes of this section, non-operation shall be deemed to include, but shall not be limited to, the anemometer instrument(s) being removed from the anemometer tower or disconnected so that wind resources are no longer being measured, the blades of the WTG remaining stationary so that wind resources are not being converted into electric or mechanical energy, or the WTG is no longer connected to the public utility electricity distribution system. In the event a WTG owner fails to remove the WTG tower or the anemometer tower as required by this section the County shall have the authority to remove the tower and shall utilize the performance bond to cover the costs of such removal. If the performance bond is not sufficient to cover the cost of the removal, or if the performance bond has expired or is not available. The County shall institute an action in a court of competent jurisdiction for the collection of the cost for removal.

18.47.11 Duration of Permit

A permit to operate a temporary anemometer tower shall be valid for one year and may be extended for a maximum of one additional year. A permit to operate a WTG shall be valid for 20 years with review of the operation by the County Planning Commission at a public hearing every five (5) years.

18.47.12 Use of Current Technology

WTGs shall be designed to the current state of the technology. Used, outdated or obsolete WTG equipment shall not be permitted to be constructed or installed. With respect to performance standards set forth in this ordinance, repairs and parts replacement shall not be of lesser quality than that of the original permitted equipment and shall be upgraded to the performance standards current at the time of the repair. In no case shall repairs or alterations be allowed which will decrease the degree to which the WTG complies with this ordinance.

18.47.13 Major Equipment Replacement during Life of the Permit

Should the WTG operator wish to replace major components such as turbine blades, generator, main gear box, nacelle, or the entire WTG, the operator shall demonstrate that the WTG will substantially meet the then current criteria for new WTG permits, except that setback distances will not be increased. In no case

shall replacement or alterations be allowed which will decrease the degree to which the WTG complies with this ordinance.

18.47.14 WTG Permit Renewal

At any time the operator of a WTG may elect to seek a new permit for a given site. A new WTG permit shall not allow aspects of the previous permit to be "grandfathered". To qualify for a new permit the WTG installation shall meet all criteria of the then current standards.