ARTICLES OF THE WARRANT FOR THE BOURNE SPECIAL TOWN MEETING

MONDAY, MAY 9, 2011

7:30 P.M.

BOURNE HIGH SCHOOL AUDITORIUM

<u>ARTICLE 1:</u> To see if the Town will vote to amend the Wind Energy Conversion Systems (WECS) bylaw as follows: Sponsor – James Potter and others

3460. WIND ENERGY CONVERSION SYSTEMS (WECS).

- **3461. Purpose.** The purpose of this section is to provide for the development and use of wind power as an alternative energy source, benefiting both the economy and the environment, while protecting public health, safety and welfare, preserving environmental, historic and scenic resources, controlling noise levels and preventing electromagnetic interference.
- **3462.** Applicability. Any application to erect a wind energy conversion system shall comply with section 3460, with the following exemptions.
 - A. WECS having manufacturer's rated capacity of not more than 300 watts, or.
 - B. Building-mounted WECS having overall height not more than eight feet (8') above the roof's highest point.

3463. Definitions.

A. Wind Energy Conversion Systems (WECS)

All equipment, machinery and structures utilized in the connection with the conversion of wind to other forms of energy.

B. Commercial Wind Energy System (CWES) A WECS consisting of one or more wind turbines with a rated capacity greater than 10 kW.

C. Residential Wind Energy System (RWES)

A WECS consisting of a single wind turbine, with a rated capacity of not more than 10 kW, intended as an accessory use

D. Neighborhood Wind Energy System (NWES)

A Class I, II, or III net metering wind turbine located in a residential district serving multiple residential customers served by a single utility and as further defined by the Massachusetts Department of Public Utilities (DPU).

E. Wind Turbine: A single device that converts wind to electricity or other forms of energy, typically consisting of a rotor and blade assembly, electrical generator, and tower with or without guy wires.

F. CWES Fall and Ice Shed Zone

The area that lies within a circle around each NWES and CWES tower, the radius of which is arrived at by application of the following formula: [hub height + rotor diameter x 1.5]. All NWES and CWES shall maintain the required Fall and Ice Shed Zone ("Safety Zone") from any occupied structure (residential and non-residential), public or private road or regularly used public area. Such Safety Zone shall be entirely on the applicant's development site or under applicant's control. However, the preceding notwithstanding, the Safety Zone shall in no event be less than that specified by the supplier and/or manufacturer of the WECS in its standard safety specifications in effect at the time of project permitting.

G. Critical Infrastructure

Facilities and infrastructure listed within the Town of Bourne's Pre-Disaster Hazard Mitigation Plan.

3464. Special Permit Granting Authority: The Planning Board shall be the Special Permit Granting Authority for

all WECS application. No Special Permit shall be granted unless the Planning Board finds that the proposed WECS is in harmony with the purpose and intent of this Bylaw and will not be detrimental or injurious to the neighborhood in which it is to be constructed, or to the public, taking into consideration among other things the height of the WECS in relation to the anticipated amount of electrical energy generation, the location of the WECS is relation to topography, the natural environment, dwellings, historical and scenic features, and safety, and that all requirements, standards and conditions for the granting of the Special Permit have been satisfied. Furthermore, no Special Permit shall be granted unless the Planning Board determines that the proposal will not have an undue adverse impact on historic resources, scenic views, natural resources, and/or residential property values.

3465. Development Requirements.

A. Required of all WECS

- 1. Proposed WECS shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable electrical, construction, noise, safety, environmental and communications requirements.
- 2. Applicants shall provide a complete description of the proposed WECS including technical, economic, environmental, and other reasons for the proposed location, height and design.
- 3. Height Calculation. Overall height of the WECS shall be measured from the land in its natural state at the base of the tower prior to grading or filling to the highest point reached at any time by any part of the wind turbine. For WECS attached to a building, height is to be measured as specified in footnote "n" to the Section 2500 Intensity of Use

Schedule, and the provisions of that footnote must be complied with.

- 4. Flight Path Height Restriction. No WECS located in the flight path as shown on a map entitled "USCG Air Station Cape Cod Emergency Visual Routes in Inclement Weather" Bourne, Massachusetts, dated January 26, 2007, shall be erected or altered to a height, which would exceed one hundred (100) feet. WECS erected between 60 to 100 feet within the USCG flight path shall include a fixed warning light.
- 5. Monopole towers are the preferred type of support.
- 6. Setbacks (except for acoustic setback covered under "Noise"..
 - a) NWES and CWES shall observe a setback distance from all property lines equal to the Safety Zone.
 - b) No part of the WECS support structure, including guy wire anchors, may extend closer to the property boundaries than the standard structure setbacks for the zone where the land is located.
- 7. Wetlands. No part of a WECS shall be located within the jurisdiction of the Bourne Conservation Commission unless issued an Order of Conditions
- 8. Noise.

8.1 All WECS shall observe a minimum acoustical setback from any residentially used or zoned parcel a distance of at least ten (10) times rotor diameter, measured from the closest part of the WECS tower to the closest property line of all residentially used or zoned parcels.

8.2 The WECS and associated equipment shall conform to the following minimum sound level limitations:

- a) No WECS shall produce a dB(A) sound pressure level that is 6 dB or more above the lowest predevelopment L90 dB(A) level (statistical noise level exceeded 90 percent of the time) measured over a sufficient time duration to represent the quietest part of the daytime or nighttime for which operation is scheduled to occur (See ANSI S12.18).
- b) No WECS shall produce, during the hours of 7:00pm and 7:00 am, a broadband sound pressure level that exceeds 35 dB(A), attributed to the WECF itself.
- c) No WECS shall produce lower frequency sound pressures, attributed to the WECS itself, that exceed 50 dB(C), or lower frequency sound pressures that are shown to contain a separation of 10dB or greater when measurements in dB(A) are subtracted from measurements in dB(C).
- d) No WECS shall produce amplitude modulated noise, measurable in overall A-weighted sound pressure level, which is shown to contain peak to trough separations of 4dB or greater.
- e) No WECS shall produce a Pure Tone condition, as that term is defined in Massachusetts 310 CMR 7.10, as measured in octave bands or by equivalent measurements in 1/3rd octave or narrow band.

8.3 All above measurements shall be attended and shall be taken on any adjacent residentially used property, or on adjacent land zoned to permit residential use. Compliance at the closest property line is required.

8.4 Measuring for background (ambient) sound levels shall:

A). Be attended measurements; B). Exclude periods of insect or other seasonal noise, or otherwise adjust collected data so that impacts from the same are removed; C). Exclude periods or moments of observed heightened sound levels not considered typical ambient noises (i.e. passing airplane or train); and D). Be avoided or suspended in (or

adjusted to eliminate) periods of poor weather conditions and/or periods of significant wind speeds.

8.5 With post-construction testing or monitoring, aerodynamic amplitude modulated noise ("AAM") shall be examined with the sound level meter ("SLM") set for fast response, with a sampling rate of at least one measurement per 1/8th second. AAM noise shall be recorded in overall A-weighted sound pressure level and 1/3 octave band center frequencies for the predominate frequencies of interest. Audio recordings shall be made periodically during testing to provide audible indication of the nature or cause of the sounds being measured.

8.6 Post-construction lower frequency sound analysis shall be recorded in dB(A), dB(C), and 1/3 octave band for the predominate frequencies of interest.

8.7 Post-construction infrasonic sound pressures shall be measured using the best technologies available at the time of such testing and may include unweighted measurements, and measurements in dB(G), dB(L) and/or dB(Z).

8.8 Pre-permitting acoustical projections and modeling shall be done under the supervision of the special permit granting authority ("SPGA"). Postconstruction acoustical monitoring and testing shall be performed under the supervision of the Zoning Enforcement Officer or his designee, hereinafter the "Enforcing Person", who may order mitigation measures including operational controls of any WECS if needed to insure ongoing compliance with this by-law.

8.9 As to both pre-permitting, and post-construction testing and monitoring when ordered by the Enforcing Person, WECS developers and owners must hire, at it or their sole cost and expense, a qualified acoustical engineer to undertake a study or studies, or to undertake short or long term monitoring (as appropriate for the condition under study), to quantify sound pressures likely to emanate from or emanating from the applicable WECS and to submit one or several written report(s) of such study, which shall be public information.

8.10 With both pre-permitting and post-construction acoustical testing, the WECS developer or owner must pay into a special municipal account

sufficient funds to cover reasonable peer review done by a qualified acoustical engineer hired by the SPGA or Enforcing Person as applicable. Any such funds shall be administered in accordance with M.G.L. c. 44 § 53A.

8.11 A qualified acoustical engineer (for pre-permitting or post construction testing) shall be either a degreed engineer practicing acoustical engineering and working for a firm that is a member of the National Council of Acoustical Consultants (NCAC) or a member of the Institute of Noise Control Engineering (INCE). All persons conducting sound pressure measurements to assess compliance or likely compliance with this by-law shall be trained in the current techniques and principles of sound measurements under the supervision of the qualified acoustical engineer described above.

8.12 All sound pressure level measurements will employ appropriate equipment that is properly calibrated to industry standards. The precise location(s) of the measurement site(s), as well as dates, times, frequency, and duration of the measurements or measurement periods shall be as determined by the SPGA or Enforcing Person. All testing or monitoring results, reports, studies and conclusions shall be made a permanent part of the public record. Those records shall include all raw data collected in formats that facilitate peer and public review of the data and the study or studies. To facilitate such peer and public review, wherever possible, such raw data shall be submitted in digital form as well as hard copy. Wherever possible, all such collected data shall become internet/web-accessible to the public with uploads either continuously during testing or periodically as soon as practical.

8.13 The acoustical set back prescribed above is a minimum standard. The SPGA may deny an application for a special permit even where such minimum standard is met, if it finds, based on the pre-permitting acoustical studies required by this by-law, that a greater distance is required to insure compliance with the noise limitations prescribed above.

8.14 Because RWES are considerably smaller than NWES and CWES, the SPGA may determine that no pre-construction noise modeling or testing is required.

8.15 Upon written notification of a complaint of excessive noise, the Enforcing Person or his designee, shall record the filing of such complaint. The Enforcing Person shall promptly investigate. If noise levels are determined to be excessive, the Enforcing Person shall require the property owner to perform ambient and operating decibel measurements at the nearest point from the wind turbine to the property line of the complainant and to the nearest inhabited residence, as described herein.

8.16 If the noise levels are found to have exceeded the above allowable limits the Enforcing Person shall notify in writing the owner of the property to correct the violation. If the noise violation is not remedied within 30 days the WECS shall remain inactive until the noise violation is remedied, which may include relocation or removal.

8.17 If determined that allowable limits have not been exceeded, notice in writing shall be provided to the person who has filed such complaint and the owner of the property stating that no further action is required. Any person aggrieved by the decision may appeal said decision to the Board of Appeals in accordance with Section 1320 of this Bylaw. Any such appeal must be filed within (30) days after the receipt of the decision of the Enforcing Person.

- 9. Shadowing/Flicker. The WECS shall be sited in a manner that does not result in shadowing or flicker impacts above 5 hours per year to a residence. The applicant has the burden of proving that this effect does not have significant adverse impact on neighboring or adjacent uses either through siting or mitigation.
- 10.**Prevention of Access**. The applicant/owner shall ensure that all related components of the WECS are protected from unlawful access.
- 11.Visual Impact. The applicant shall employ all reasonable means, including restraint in tree removal, landscaping, and alternative locations to minimize the visual impact of all WECS components. All components of the WECS and its

support structure shall be painted plain non-reflective muted colors.

- 12.No WECS shall exhibit any form of decoration or graphics unless given express approval by the Planning Board, and then shall be limited to the name of occupant of the premises or manufacturer located on the nacelle of the wind turbine.
- 13.Electromagnetic interference. No WECS installation shall cause electromagnetic interference. If interference is established the Inspector of Buildings shall notify the owner of the property in writing to correct the violation. If the interference is not remedied within 30 days the WECS shall remain inactive until the interference is remedied, which may include relocation or removal.
- 14.Lighting. If lighting is proposed (other than required FAA lights) the applicant shall submit a plan indicating the horizontal foot candles at grade, within the property line and for twenty-five (25) feet beyond the property lines. The plan shall also indicate the locations and types of luminaries proposed.
- 15.Vegetation. Existing vegetation must be shown including average height of trees and any proposed vegetation removal on the subject property or abutting properties. The Planning Board shall also consider the height of vegetation at maturity.
- 16.Compliance with FAA Regulations and MMR Flight Paths. WECS must comply with applicable FAA regulations and MMR flight paths as shown on the map referred to in Section 3465(4).

17. Avian impact avoidance. Applicants for a special permit for a CWES shall submit to the Planning Board documentation that the siting, equipment selection. facility design, and operation management will effectively minimize avian impacts, evidenced by an avian impact assessment conducted by a qualified third party, assessing the potential impact of the proposed WECS upon bird and bat species. The avian study shall at a minimum report on a literature survey for threatened and endangered species, and any information on critical flyways. The applicant must identify any plans for post-construction monitoring or studies. The analysis shall also include an explanation of potential impacts and propose a mitigation plan, if necessary.

B. Residential Wind Energy Systems (RWES).

- 1. Shall consist of a single wind turbine per lot, with a rated capacity less than 10 kW.
- 2. The overall height shall be determined by special permit. Overall height must be consistent meeting the setback requirements of Section 3465 A.6 and, if more restrictive, shall not exceed seventy-five (75) feet in overall height unless as part of the special permit process the applicant demonstrates that additional height is functionally essential and that the additional height does not does not substantially increase any adverse impacts.

C. Neighborhood Wind Energy System (NWES)

1. Shall consist of a single Class I, II, or III net metering wind turbine as defined by the Massachusetts Department of Public Utilities, with a rated output greater than 10kW, located in a residential district.

- 2. Shall be owned by or serve the energy needs of multiple residential customers, served by a single utility in a single neighborhood.
- 3. Shall be subject to the requirements of the CWES specified in Section 3465 D.

D. Commercial Wind Energy Systems (CWES).

- 1. A Wind Turbine with a rated capacity of more than 10 kW
- 2. May include multiple wind turbines, however, in no event, shall the number of wind turbines exceed one (1) per two (2) acres,
- 3. Land area may be comprised of several contiguous parcels single or multiple ownership.
- 4. A wind turbine erected on a lot with another principle use requires a lot area twice the minimum lot area as stated in Section 2500.
- 5. Height shall be determined by special permit. The Planning Board shall make findings that the height proposed reflects industry standards for a similarly-sited facility, and is the minimum necessary for adequate operation of the CWES.
- 6. Projects including land in multiple ownerships shall include each owner of the land as a party to the application and, upon plan approval, subject to its provisions.
- 7. Telecommunications. CWES may include telecommunication antennas provided they comply with Section 2500 of this bylaw. The telecommunications carrier shall be named as the co-applicant. Co-applications are encouraged.

3466. Procedural Requirements:

A. Special permit submittals

- 1. Site Plan. A site plan must be submitted, prepared to scale by a registered land surveyor or civil engineer showing the location of the proposed WECS, distances to all property lines, existing and proposed structures, existing and proposed elevations, public and private roads, above ground utility lines and any other significant features or appurtenances. Any portion of this section may be waived if in the opinion of the Planning Board the materials submitted are sufficient for the Board to make a decision.
- 2. **Inspection**. Provisions for inspection and maintenance must be made and identified in the submittals.

B. Building permit submittals

- 1. Wind Turbine structure drawings. Building permit applications shall be accompanied by standard drawings of the wind turbine structure, including the tower. base. and footings. Documentation showing compliance with the Massachusetts State Building Code certified by a licensed professional engineer shall also be submitted. (Manufacturer specifications may be suitable at the discretion of the Inspector of Building)
- 2. Electrical drawings. Building permit applications for WECS 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.

- 3. Utility Notification. No WECS 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. Off-grid systems shall be exempt from this requirement.
- 4. **Insurance.** The applicant shall be required to show evidence of liability insurance in an amount and for duration sufficient to cover loss or damage to persons and structures occasioned by the failure or performance of the facility.
- **C. Abandonment** A WECS shall be considered to be abandoned if it is not operated for a period of two years or if it is designated a safety hazard by the Inspector of Buildings. Once a WECS is designated as abandoned, the owner shall be required to physically remove the WECS within 90 days of written notice. "Physically remove" shall include, but not be limited to:
 - 1. Removal of WECS, any equipment shelters, and security barriers from the subject property.
 - 2. Removal of foundation, unless in the opinion of the Inspector of Buildings the foundation will pose no hazard.
 - 3. Proper disposal of the waste materials from the site in accordance with local and state solid waste disposal regulations.
 - 4. Restoring the location of the WECS to its natural condition, except that any landscaping and grading shall remain in the after-condition.

- **D. Modifications.** All modifications to a WECS made after issuance of the Special Permit shall require approval by the Planning Board.
- **E. Professional Fees.** The Planning Board may retain a technical expert/consultant to verify information presented by the applicant. The cost for such a technical expert/consultant will be the expense of the applicant.

3467. Security.

- A. Requirement. In conjunction with the above special permit approval process the Planning Board may require the posting of a bond or other security to assure satisfactory fulfillment of the above, in such sum and in accordance with such conditions as the Board may determine necessary.
- **B.** Exception. The Board need not require security where there is full assurance of compliance with the above special permit.
- **C. Amount**. The amount of security required shall not exceed either the estimated costs of the measures proposed, or the estimated cost of restoration of affected lands and property if the work is not performed as required, whichever is the greater.





APPROVED: April 20, 2011

BOARD OF SELECTMEN

John A. Ford, Jr.

Jamie J. Sloniecki

Mary Meli

Stephen F. Mealy

Donald J. Pickard

Barnstable, ss.

Bourne, Massachusetts

By virtue of the Authority vested in me, I have this day posted a true and attested copy of this warrant in the Bourne Veterans' Memorial Community Center, Bourne Town Hall and in all the post offices in the Town of Bourne viz: Buzzards Bay Post Office, Bourne Post Office, Monument Beach Post Office, Pocasset Post Office, Cataumet Post Office, Sagamore Post Office, and the Sagamore Beach Post Office.

Dated this	day	of	, 2010
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Constable

Received in the Town Clerk's Office

Barry H. Johnson, Town Clerk