

BY ANNE ADAMS • STAFF WRITER
MONTEREY —

Senior planner Darryl Crawford, of the Central Shenandoah Planning District Commission, handed planners a list of recommendations to consider for wind energy permit applications last week, telling the commission it should determine whether Highland County wants industrial wind plants within its borders. A summary of Crawford's 20-page set of recommendations is outlined below:

Crawford told officials, "Should you determine that there are possibilities for largescale wind facilities somewhere in Highland County either now or in the future, we would recommend the following base factors for consideration in addition to the minimums listed in the zoning ordinance":

- Results of state and federal (if applicable) review processes and resulting recommendations — especially from environmental reviews
- Height of turbines at nacelle and the highest point of the installed vertical blade
- Proximity of proposed turbine structures to permanent residential structures on adjacent non-participating properties
- Proximity of proposed turbines to existing KV transmission lines with existing available capacity to accept the electricity generated
- Surrounding topography
- Surrounding tree coverage and foliage
- Amount of land clearing and road cuts required
- Design and placement of structures — mitigating visual obtrusiveness
- Consistency with the comprehensive plan and purposes served by zoning.

"We recommend the following to ensure that the planning commission and board of supervisors will have sufficient relevant information to render an informed and reasoned

decision”:

State and federal regulations and requirements should be complete and delivered at the time the conditional use permit application is submitted to the county:

- Applicant shall list all known state and federal agencies with authority to regulate such projects or structures and demonstrate compliance with applicable best practice standards and governmental regulations.
- National Environmental Policy Act environmental compliance report identifying impact on environmental resources, prepared in accordance with the act. Documentation should include recommendations of alternatives necessary to address environmental issues raised.
- Federal Aviation Administration air navigation hazard determination report with lighting requirements and determination of “No Hazard to Air Navigation” from the FAA
- National Historic Preservation Act – If not already included with NEPA, a historical resources impact report shall be prepared in accordance with the act. Report should be accompanied by written comments from the state historic preservation office.
- State Corporation Commission – An approved certificate of public convenience and necessity to construct and operate an electric generation facility.
- Approved entrance permits and other required approvals for signage, road closures, or other activities approved by the Virginia Department of Transportation.

Applicant shall provide scaled site plans and site surveys:

- Plats and deed book references for the properties upon which the proposed project will be located
- Lot dimensions with property line monuments

located thereon for all participating properties

- Topography
- Ground elevation contours (five foot intervals)
- Water courses
- Easements (private and public)
- Information regarding adjoining nonparticipating properties (including owners, adjacent structures, and uses, both permanent and seasonal)
- Coordinates, footprint dimensions, size, and use of all existing and proposed structures on the properties upon which the project will be located (include antennas and towers)
- Tower footprints including longitude and latitude of proposed turbines
- Setbacks of turbines, auxiliary structures, substations, and other related facilities from property lines with adjoining non-participating properties
- Designate safety fall zones
- Designate spillage containment areas
- Designate coordinates and footprints of existing and proposed auxiliary/accessory buildings, support structures, repair areas, bone yards, blades storage, equipment shelters, fencing, parking areas, substations, etc.
- Designate all current and proposed utilities servicing the site
- Designate coordinates of proposed transmission lines from turbine sites to KV lines (also designate where lines will be above and below ground)
- Designate all current and proposed access roads to turbine sites, auxiliary buildings, substations, or other structures or facilities associated with the project (noting whether they are temporary and permanent)
- Designate temporary ingress/egress points for use by construction crews and material/equipment suppliers, including any proposed construction access road cuts
- Designate permanent ingress/egress points from public highways
- Designate footprints of any vehicle pulloffs, tourist interpretive centers, parks, or other

public use areas associated with the project
(if any)

Applicant shall provide
elevation views of all proposed
structures

- Show structural style and design of all proposed turbines including type, make, model, capacity, height of tower at nacelle, and height of structures at highest point of the installed vertical blade
- Include equipment description and specifications as an addendum
- Height, design, appearance, and color of all auxiliary and accessory structures, buildings, and/or shelters
- Height and design of fencing, etc.
- Height and design of substations, towers or equipment associated with transmission lines going from turbines to the KV lines
- Height and design of any tourist interpretive centers and/or other similarly related facilities associated with the project (if any)

Applicant shall provide vicinity
wind energy project maps:

- Show proximity of proposed project site to existing KV lines
- Show site proximity to public highways
- Show site proximity of project to personal residences on adjacent non-participating properties, commercial operations, designated public use areas, listed historical and archeological sites, widely used back country sites, backpacking trails, state-owned and federally-owned lands, designated Virginia Scenic Byways, and advertised tourism destinations
- Directions to the proposed project site

Applicant shall provide
supplemental plans and any
other information that may
assist the commission and
board in making an informed decision:

- Proof that the project has encumbered sufficient capacity in the existing KV lines that new KV lines will not need to be built or existing KV lines will not need to be upgraded for purposes of this project.

- Turbine lighting plan including requirements by the FAA — type, locations, number, color, flash patterns, and tower striping (if any)

- Exterior lighting plan for auxiliary/accessory buildings and other structures or facilities related to the project including type, locations, lumens, and design

- For entire project, applicant shall provide: storm water and erosion and sediment control plans; existing vegetation maps showing locations of proposed land disturbance and degree of slope in those areas; revegetation/reclamation plans for post construction, including around turbine sites and road cuts made for temporary construction access; revegetation plans in the event that turbines, auxiliary structures, or facilities are removed.

- Landscaping and screening plans for accessory buildings, substations, and other structures or facilities related to the project

- Map of geologic features and mineral resources located on the site including a map showing karst areas, caves, and sinkholes with footprints of all proposed turbines and auxiliary structures overlaid.

- Design standards for access roads (both temporary and permanent)

- Site grounding and electrical plan including transmission lines

- Designate locations, size, and design of all signs or advertising to be displayed on or near the site

- Emergency response plan

In a point-by-point narrative, the applicant shall:

- Address construction issues: Proposed work schedules; procedures for handling anticipated road closings or other disruptions of

normal traffic patterns; and procedure for abating construction noise and suppressing dust generated during construction process

- Address potential interference with TV reception
- Address any potential or known health effects to non-participating adjoining property residents and how they will be mitigated (if any)
- Address potential effects of stray voltage on adjoining non-participating properties and how they will be mitigated
- Address how potential issues with shadows, flicker, and/or strobe effects on adjoining non-participating properties will be mitigated
- Address how potential for ice throws will be mitigated
- Address how potential for lightning strikes will be mitigated
- Designate procedures for handling spillages
- Designate procedures for handling broken blades, fallen towers, or other damages to equipment and turbines
- Designate repair and maintenance procedures and schedules
- Describe safety procedures to be employed for the project
- Describe why this project is needed for Highland County now or in the future
- Describe impacts on traffic in the area once the project is operational
- Address impacts on tourism and other local businesses in the project area
- Address impacts on property values in the project area

Applicant shall provide a visual impact assessment:

- Visual impact assessment shall be conducted by a professional landscape architect generally following the guidelines outlined in the scenery management system defined in *Landscape Aesthetics, A Handbook for Scenery Management* (U.S. Forest Service 1995) and *Visual Impact Assessment for Highway*

Projects (Federal Highway Administration 1988)

■ Six steps shall be required to be performed in the assessment of visual impacts

They are as follows:

1. Define the project and view shed from a visual perspective
2. Identify key views for visual assessment
3. Analyze existing visual resources and viewer response
4. Depict the visual appearance of various project alternatives
5. Assess the visual impacts of project alternatives
6. Propose methods to mitigate adverse visual impacts identified

■ At a minimum, research associated with the visual impact assessment shall include:

■ GIS mapping study of all areas from where proposed turbines will be potentially viewable

■ Photo-simulation photographs of the site from relevant viewpoints such as public and scenic roadways, five closest permanent residences of adjacent non-participating properties, historic locations, public use recreation areas, wilderness areas, commonly used hiking/backpacking trails and advertised tourism destinations

■ Simulated photographic images of the actual placement of all structures. Multiple options of potential final placement patterns may be presented.

■ Photographs with the simulated images shall be from varying distances including foreground, mid-ground, and background of the site.

■ Photographs with the simulated images shall be shown for morning (sun rising), lateafternoon (sun setting), and evening (showing night view of lighting) for all four seasons (winter, spring, summer, and fall)

■ Before and after photos shall be submitted

■ A map shall be supplied indicating by reference the locations of each photograph

■ Line of site drawings (to scale) depicting in profile, a sight line from the five closest

permanent residences on adjacent non-participating parcels and the nearest public highways. Profiles shall show intervening tree masses and buildings

■ Costs associated with conducting the Visual Impact Assessment shall be borne by the applicant

Applicant shall conduct balloon tests:

■ Balloon tests shall be conducted jointly at the location coordinates of all proposed structures in excess of 199 feet at their highest vertical point

■ Balloons shall be a minimum of five feet in diameter and of a highly visible color

■ Balloons shall be flown continuously for a period of 24 hours at the height of the highest vertical point of the proposed structure

■ Applicant is responsible for all FAA approvals or other requirements

■ Applicant shall coordinate date, time, and public notification of the tests

■ Costs associated with conducting the balloon tests and the public notification shall be borne by the applicant

Applicant shall conduct public information meetings

■ Potential applicants shall hold public meetings prior to the application to the county to discuss development plans and address community concerns, including the examination of alternative suggestions resulting from the balloon tests

■ Applicants shall notify adjoining property owners of pending applications with all federal, state, and local entities with review

authority and provide a signed affidavit to the county attesting to compliance

■ Costs associated with the meetings shall be borne by the applicant

“Nothing is going to change the reality that the turbine structures are nearly 400 feet tall at the vertical tip of the installed blade. There is only so much that can be done to address visual impacts. We recommend the following in order to achieve a development that addresses those elements that can be mitigated to some extent”:

Recommendations for design, placement, etc.:

■ Setback distance for turbines shall be equal to 400 percent of the height of the structure from the nearest property line with any adjacent non-participating property

■ Turbines shall not be located closer than one-half mile from any commonly traveled public highway or closer than the established setbacks to existing residences on any adjacent non-participating property unless the property owner agrees in writing to placements being closer

■ Project design shall avoid placing turbines on ridge lines or ridge tops with unusual or distinctive topographic form, or dramatic cliffs that serve as visual focal points

■ All turbines shall be of the same well-proportioned, columnar design. No lattice-type structures shall be permitted

■ Subject to FAA standards,

turbines shall be painted in neutral, non-reflective color

- Structures shall not be climbable from the outside
- Turbines shall be devoid of all logos, advertising, graphics, attachments
- All turbine blades shall turn in the same direction
- Lights on turbines shall be shielded from view below
- Concrete pads and transformers at the base of turbines shall be screened from off-site view
- Auxiliary buildings and accessory structures shall satisfy minimum zoning district standards and setbacks
- To the extent possible, auxiliary buildings and related structures used with the project shall use designs, materials, colors, textures, screening, and landscaping that blend the facilities with the natural setting and existing built environment (if any)
- Number, color, design, and type of lights on auxiliary buildings and related structures used in conjunction with the project shall minimize light pollution and be shielded to direct light only where necessary on the site
- Security fences shall be placed around turbine structures, equipment and blade storage areas, and elsewhere as appropriate
- No advertising of any type shall be placed on accessory buildings, substations, or related structures
- Appropriate signage, not exceeding four square feet displaying the facility owners' name, address, and 24-hour emergency

contact information including name and telephone number shall be located on the security fence of each turbine and at ingress/ egress points from the closest public highway (requires VDOT approval)

■ Safety and other signage as appropriate and required by state and federal agencies with regulatory authority shall be permitted

■ Statements regarding electromagnetic frequency exposure shall be located at each individual turbine site

■ Project design shall minimize the need for developed roads, cut-and-fill slopes, and overly large clearings around the turbine sites

■ Project design shall rely on existing roads wherever possible

■ Project design shall avoid sites that require construction activities on steep slopes

■ During construction, improved roads and construction staging areas shall be kept to a minimum

■ Care shall be given by construction crews and material suppliers to avoid sensitive habitats

■ Where possible, on-site power lines shall be located underground, along existing roads, or in flexible above-ground tubing that can be threaded through the forested areas with minimal disturbance

■ No new KV transmission lines shall be developed, installed, or enhanced to connect into the existing power grid. Projects shall use available capacity on existing KV transmission lines

■ Wind generation facilities shall be located in close proximity

to existing KV power lines

- No new off-site transmission lines shall be permitted to cross adjacent non-participating properties to connect the project to the KV lines without written permission from the owners of those properties, even if using power line rights of way

- Building permits shall not be issued for any part of the project without legally binding power purchase agreement for x number of years in place

- All turbines shall be maintained in good, working order. Non-functioning and damaged turbines shall be repaired or removed without delay

- Ongoing operation and maintenance activities shall be carried out as practical by use of light conveyances to minimize habitat disturbance and the need for improved roads

- Once turbines are operational, average noise levels at adjacent non-participating property lines shall not exceed the average level of typical ambient noise prior to installation of the turbines

- Substantial design changes to the exterior appearance of turbine nacelles, rotor blades, or towers due to equipment upgrades or future changes in wind energy technology shall be submitted to the county for review and permitted only upon approval

**Recommendations
for ridge lines and
ridge tops:**

- No auxiliary buildings, structures, or above ground facilities

other than the turbines shall be permitted on ridge lines or on ridge tops except as described in the next bullet

- Auxiliary buildings, structures, or above ground facilities shall be permitted on down slopes from ridge lines where the building, structure, or facility does not extend more than 10 feet above the ridge line or ridge top and on ridge lines where other natural features or natural screening such as trees are present

- In no case shall the auxiliary buildings and structures extend more than 10 feet above the height of the ridge lines, natural features, or natural screening unless visual impacts are minimal and the requirements are expressly reduced or waived by the county

Recommendations for landscaping guidelines:

- Landscaping with buffer plant materials shall effectively screen the view of the auxiliary buildings, equipment and storage areas, security fences, substations, and other non-turbine structures from the view of adjacent non-participating residences

- Standard buffer shall be landscaped strips at least 10 feet wide outside the perimeter of each compound or site

- Buffers shall be organized in groupings that provide a more natural appearance rather than straight rows

- Plant species shall be indigenous to the region and plant materials shall be at least six feet in height at the time of planting

- Existing mature tree growth and natural

land forms on the site shall be preserved to the maximum extent possible

- In locations where visual impacts are minimal or where natural growth may serve as a sufficient visual buffer, additional landscaping requirements may be reduced or waived by the county
- Landowner shall be responsible for maintaining all plant materials in a healthy condition
- Erosion which can result in injury to vegetation shall be repaired without delay
- Dead plants shall be removed and replaced in-kind within a reasonable period

Recommendations regarding regulatory compliance, decommissioning, and removal:

- If applicable standards of state and/or federal regulations change, the entire project shall be brought into compliance in a timely manner. Failure to do so will be grounds for the locality to require removal of non-compliant structures at the landowner's expense
- All structures and facilities shall be maintained in compliance with standards contained in relevant building codes and/or other applicable federal, state, and local codes with jurisdiction. Failure to comply will be grounds for the locality to require removal at the landowner's expense
- If a turbine is decommissioned by action of the landowner or facility operator, the landowner shall have it removed within six months (180 calendar days)
- If a turbine is not operated for a continuous period of six months, it shall be considered abandoned and the landowner shall remove it within six months of notice from the county notifying landowner of such removal requirement
- Removal includes removal from site of the abandoned structure(s) including turbines, auxiliary structures, substations, footers, fencing,

and all associated support facilities

- Foundations shall be removed to a depth of four feet below ground level and covered with an equivalent depth of fill material. The site shall be revegetated in accordance with a plan approved by the county.

- With the exception of underground fuel storage tanks and/or hazardous materials of any type, non-hazardous materials may remain below ground

- The county may seek a court order for removal or the county may remove at the landowner's expense if structures and facilities are not removed in a timely manner

- Prior to issuance of the building permit(s), a surety bond or binding letter of credit in an amount equal to the full cost of the removal and revegetation of each structure site shall be furnished to the county to insure removal

Recommendations regarding review costs:

- All costs for obtaining and preparing the relevant information necessary for the planning commission and board of supervisors to properly consider the application shall be borne by the applicant

- Any costs associated with the review of the project on behalf of the county by an independent, licensed engineer or other technical consultants necessary for the planning commission and/or board of supervisors to adequately understand the relevant information shall be billed to the applicant

- Additional review costs incurred by action or inaction of the applicant shall be borne by the applicant

Some additional issues that

will need to be addressed
should (the county) decide to
move forward permitting
wind energy projects are:

■ Decisions need to be made as to whether the length of a conditional use permit will be tied to the life of the turbine structures or the length of the power purchase agreements. Power purchase agreements may run from a few years to many years. Given the up-front investment cost to developers, the permit should probably be tied to the anticipated life of the structures. There will need to be provisions in the decommissioning and removal conditions to permit limited periods of nonoperation should there be delays in efforts to renew or obtain new PPAs.

■ Permits are issued to the landowner, not the project. Large wind farm developments tend to be sold multiple times throughout the life of the project. Written agreements and conditions should be legally binding to all parties in order to protect the interests of the county, its citizens, and the landowners obtaining the permit.

■ One of the most difficult tasks will be defining “continuous non-operation” that would result in a requirement for removal of a turbine. Does simple inactivity constitute nonoperation or does it require an action on the part of the permit holder to notify the county the turbine is inoperable? What if the turbines turn to generate electricity only once every six months — are they still considered operable? What is considered a reasonable time to wait on a repair? Suppose the turbines were continuously inoperable for six months, but they become operable again during the period allowed for removal? Will they be permitted to stay?

“These and other concerns related to decommissioning and removal will need to be addressed in any conditional use permit agreement. Should (the county) choose to move forward with the possibility of permitting large

wind facilities in Highland County, our concluding recommendation to the board of supervisors will be that you authorize the county attorney to access, on the county's behalf, land use and utility attorneys that have specialized background and knowledge in these types of cases."

Editor's note: The full text of Crawford's document is available in the clerk of the board's office at the courthouse in Monterey. The two-volume set of research compiled by the CSPDC is also available there, at the Highland County Public Library, and at The Recorder. © June 4, 2004, Anne Adams, Recorder Publishing of Va., Inc.