Antrim Wind, LLC SEC Docket No. 2012-01 Page 1 of 12 July 31, 2012

STATE OF NEW HAMPSHIRE SITE EVALUATION COMMITTEE

RE: Application of Antrim Wind, LLC for Certificate)of site and facility to construct up to 30 MW of wind electric)generation in Antrim, New Hampshire and operate the same.)

PRE-FILED DIRECT TESTIMONY OF LORANNE CAREY BLOCK

Q: Please state your name and address.

A: Loranne Carey Block, 63 Loveren Mill Road, Antrim, New Hampshire 03440.

Q: What are your qualifications to speak to the application presently before the Site Evaluation Committee?

A: I have lived in my home on Loveren Mill Road in Antrim for the last twenty-four years. My husband and I own 233 southfacing-slope acres immediately facing the Tuttle Ridge. In 1990, I worked together with my husband, Richard, to extend the Rural Conservation Zoning District north of Route 9 to the town border. For many years I served on the North Branch and Contoocook Rivers Locally Advisory Committee. In 1999, the Society for the Protection of New Hampshire Forests named us as informal land stewards for the Nature Conservancy's Loveren Mill Cedar Swamp property and the Meadowsend Timberland forestry holding because of our historical, cultural, and environmental concerns for the region. In 2005-2006, I served on Antrim's Open Space Committee. In 2006-2007, I participated in the Keeping Track training program led by Sue Morse which was sponsored by Sweetwater Trust for volunteer wildlife monitoring at Pioneer Pond in Stoddard. In 2008, I completed the Coverts Cooperator training program for wildlife volunteer educators sponsored by UNH. Additionally, we have been plaintiffs in the consolidated court cases against Eolian's met tower.

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Q: Please describe the lack of technical/managerial skills you have observed demonstrated by Eolian over the past three years.

A: In 2009, we were shocked by the poorly prepared application that Eolian submitted for a variance for their met tower to the Antrim ZBA. Submitted under the towns Small Wind Energy Systems article, it was woefully inadequate with incomplete answers that clearly exposed their inexperience. (See Exhibit LB1: Antrim Wind application and LB2: Antrim Small Wind Energy Systems Article) Throughout this process they have shown their incompetence by choosing one direction and then another. Multiple simultaneous approaches has continually been their modus operandi. From the original friendly letter that they sent to their "neighbors" in the spring of 2009 where they talked of a small six to eight 2 MW turbine project they have grown, without any prior experience to support their expansion, to a ten 500-foot 3 megawatt project. Numerous times throughout, they have been questioned whether their intent is to sell upon permitting. Receiving vague answers and therefore without ever being convinced otherwise, one must simply be skeptical of their plans. Since to date they have only erected one very small turbine in the Bahamas years ago, their clear lack of experience/managerial skills and dubious finances that they are unwilling to disclose, make them a most questionable applicant.

Q: Please describe the area where Eolian ("AWE") is proposing to locate their industrial wind facility.

A: Eolian/AWE industrial wind project is proposed for the Tuttle/Willard Ridge in the rural northwest corner of Antrim. Tuttle Hill is a central geographic feature not only in this area but in Antrim as a whole. It is the main landscape focus as you enter Antrim on Route 9 both from the west and from the east. It dominates over Gregg Lake and our town beach there. This ridge truly defines the rural landscape of Antrim.

The Tuttle/Willard Ridge is central to the Rural Conservation District, a zoning district that was created 23 years ago to "protect, conserve and preserve the remote mountainous portions of Antrim from excessive development pressures and/or activities that would be detrimental to the unique environmental characteristics and qualities of this district and detract from the peaceful enjoyment and tranquility that this district affords local residents" by prohibiting industrial uses throughout it. (See Exhibit LB3, Antrim Zoning Ordinance, Article IX, Rural Conservation District.)

Tuttle/Willard Ridge, located within a large unfragmented forest block, is adjacent to the 33,000 acre Monadnock Supersanctuary. Over the last three decades the Society for the Protection of New Hampshire Forests, the Harris Center, New Hampshire Audubon, the Trust for Public Lands, the Nature Conservancy, and Sweetwater Trust have protected 40,000 acres of contiguously forested tracts in this immediate area.

Q: As an Open Space Committee member would you describe the significance of this area?

A: In 2005, Antrim's own Open Space Committee identified this Tuttle-Willard Ridge area as having the highest priority for conservation in the town: "Based on these criteria, the following areas of Antrim are recommended for permanent land conservation ... Adding to protected land: West Antrim – the large unfragmented and remote area west of Gregg Lake to the northern boundary of the town ... Wildlife corridors: West Antrim – the large block of remote lands connecting with adjacent towns west of Gregg Lake." (See Exhibit LB4, Excerpt from Open Space Conservation Plan for Antrim and Map of Antrim Open Space Protection Priorities.) In a town-wide survey conducted at that time by the Committee, over 74% of the residents of Antrim responded that the rural character of the town is its most significant asset. The Open Space Report was approved at the 2006 Town Meeting and adopted as part of Antrim's Master Plan. One of the goals of the Master Plan is thus, "Encourage the protection of open space in unfragmented forest lands, wildlife corridors, scenic and historic areas." This emerged from the future land use visioning sessions held in 2006 where Antrim citizens expressed, as their first priority, "For the town to pursue strategic conservation of open space based on the 'Open Space Conservation Plan for Antrim.'" (See Exhibit LB5, excerpt from Antrim Master Plan.)

Q: How does this area fit into the Quabbin-to-Cardigan Corridor?

A: This Tuttle-Willard Ridge area is central to the Quabbin-to-Cardigan Corridor which has been the focus of an unprecedented interstate collaboration among the Society for the Protection of New Hampshire Forests, and twenty-six more partners including New Hampshire Audubon, the Harris Center, the Nature Conservancy, and the Monadnock Conservancy. It has been designated as a Core Conservation Focus Area in this 100-mile long, two million acre region, encompassing one of the largest remaining areas of intact, interconnected, ecologically significant forest in New England. (See Exhibit LB6, Q2C Fact Sheet; Q2C Map of NH South)

Q: Do you believe that an industrial wind facility on the Tuttle-Willard Ridge will impact wildlife there?

A: As a Coverts Cooperator, and former volunteer monitor, I am aware of the abundant wildlife in our area. The Coverts training emphasizes the state's own Wildlife Action Plan who's scoring maps indicate the highest ranked habitat for this

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area. (See Exhibit LB7, Highest Ranked Wildlife Habitat Map). To address this issue further, we engaged the services of Susan Morse from Morse & Morse Forestry and Wildlife Consultants and Keeping Track, the nationally acclaimed wildlife tracking education program.

Q: What is your concern for the North Branch River corridor and other nearby lakes and wetlands?

A: As a former member of the North Branch and Contoocook Rivers Local Advisory Committee, I was able to extensively explore and research the North Branch River. Both the state and federal governments have long recognized the importance of the North Branch River Corridor. This corridor gained national recognition from the National Park Service in 1995 when it was listed on the Nationwide Rivers Inventory as having three Outstanding Remarkable Values. When compared on a national scale, the river excels in the categories of Recreation, History, and Botany, making it one of the most valued rivers in New Hampshire. (See http://www.nps.gov/ncrc/programs/rtca/nri/states/nh.html). State RSA 483:15 designated the river from Rye Pond in Stoddard to the outlet of Franklin Pierce Lake as a "Rural River," affording it special protection. Rural river management, the RSA says, "...shall maintain and enhance the natural, scenic, and recreational values of the river..." The U.S. Fish and Wildlife Service and the New Hampshire Fish and Game Department maintain a public shorebank angling area on the North Branch River at Loveren Mill Road.

The Loveren Mill Atlantic White Cedar Swamp drains into the North Branch River from the north. According to the Nature Conservancy, Atlantic white cedar swamps are one of the rarest wetland types in New Hampshire. This 50-acre cedar swamp is the second largest in the state but rated as the highest quality boreal cedar swamp in New Hampshire and perhaps in all of New England because of the size of the cedar stand, maturity of cedar trees (up to 130 years old), abundant regeneration, diversity of associated flora, ecological integrity of the surrounding landscape, and stable hydrology. Its boreal nature is due to its relatively high 1083-foot elevation and the surrounding hills which funnel cold air to the site. A lichen study revealed a number of species that indicate high air quality and lack of disturbance, largely due to the extensive intact woodland that surrounds and buffers the swamp.

Development, timber harvesting, pollution, and ground water changes are all threats to cedar swamps. Siting 500-foot turbines less than a mile from this unique natural feature should be a primary concern and warrant further analysis to determine how generated turbulence would affect this 4,000 year old cedar habitat.

Consideration should certainly be given as well to both the North Branch River and the Loveren Mill Cedar Swamp, particularly with the run-off issues from road construction, blasting, and foundations for this project, especially from the siting of Turbine #1 and the proposed PSNH substation. Concern should also be given to the effects on the large Hattie Brown Swamp, Gregg Lake, and particularly the pristine Willard Pond and its surrounding protected lands. The Appalachian Mountain Club's *Quiet Water Canoe Guide* describes Willard as follows:

This small (100 acre) pond is simply breathtaking. Moss-covered granite boulders dot the shoreline, which is wooded with mountain laurel, yellow birch, beech, red oak, red maple, and white pine. The water is crystal clear, letting you see down at least fifteen feet. The clarity of the water is actually disconcerting, because at first glance a boulder two feet under water looks as if it's almost breaking the water – then you glide right over it.

Q: What have you done professionally that has encouraged you to have a strong commitment to conservation?

A: From 1972 to 1982 I worked for the Department of Mental Health and Division of Drug Rehabilitation in the state of Massachusetts in what was then thought of as innovative rehabilitation therapy. As Program Director for the Challenge for Youth Wilderness Center in Great Barrington, I developed, organized, and led Outward Bound adaptive programs in canoeing, backpacking, and cross-country skiing. I also taught nature photography as an integral part of the program.

Over the thousands of miles that I hiked, canoed, and skied with this high-risk youth population in the remote corners of the Berkshires and Adirondack mountains, I was able to personally witness the dramatic effect that exposure to the wilderness setting had on these teens, and the lasting effect it had on their lives. In working with them to develop an environmental awareness through their photographs, I became extremely aware of the need and importance for us to maintain and preserve our undeveloped environments.

Working so intensely with these teens, particularly in the Berkshire Mountains of Massachusetts, gave me a true appreciation for the need to preserve these smaller remote wild areas, not only as wildlife habitat, but also for human rejuvenation. Having spent hundreds of days camping away from civilization has given me a most unique perspective on the importance of having access to remote locations. Places like Willard Pond, for example, are extremely rare in that they offer a type of solitude usually only accessible by long or difficult approach.

Q: Why do you feel you are qualified to address the aesthetics of this project?

A: I have an undergraduate degree in studio art/art history with specializations in color and design and graduate work in photography. My thesis, which focused on Hudson River School landscape painters, gave me the opportunity to explore the aesthetic vision of these artists who depicted scenes in the Catskills, Adirondacks, and White Mountains. Combining this sense of aesthetics with the extensive time I have spent hiking in these remote areas, has given me strong beliefs for and appreciation of the value of wild lands to the human experience.

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Q: As a visual artist, how do you see this proposed project affecting the area?

A: Tuttle Hill has a vertical rise of only 650 feet from the valley floor. Placing the proposed 500-foot wind turbines on this ridge would totally dominate the landscape. They would rise another 75% of the vertical elevation of the hill; the visual intrusion of these huge turbines is simply way out of proportion. While viewing from below can foreshorten their height somewhat, viewing from the same elevation, as would be the case from many hilly parts of town, would give full impact and totally destroy the natural view from these points. Furthermore, the giant scale of the turbines produces a distorted sense of perspective that creates total disorientation for the viewer. This massive scale also deceives one into believing that these turbines are spinning rather slowly while in actuality the speed of the blade tips may exceed 180 to 190 miles per hour.

These proposed turbines would clearly be visible for miles around as evidenced by the visual impact of the Lempster facility on its surrounding towns. I can see the Lempster turbines from my property 12 miles away. Common sense dictates that there is no way that turbines 100 feet taller can be hidden by the claimed forty-foot tree canopy.

Equally devastating would be the intrusion of flashing red lights in the night sky. While the developer has described these as a "point" of light, the cumulative effect of many turbines flashing simultaneously would totally dominate the landscape. The eye cannot help but be drawn to these. Entering Lowville, New York at night, I found the flashing turbines completely shocking and found it particularly difficult to concentrate on driving.

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Q: Can you discuss your concerns about turbine noise?

A: The members of my family are particularly sound-sensitive. Brendan, my son, and Rich are both accomplished musicians. Brendan is a nationally recognized Scottish fiddler. Having lived in the country all my life, I am acutely aware of any noise. I can hear a computer fan or a refrigerator hum from two rooms away. Since I am so sensitive to sound, we have no central heating or air conditioning, have a low-noise refrigerator, installed a deep well submersible pump, and changed to demand water heating to minimize ambient sound in our home.

Brendan, who has recording and acoustic expertise, has measured our interior ambient sound level at 18 decibels. He has thus been able to very successfully professionally record his music in our home and we all have extreme concerns that this would no longer be possible.

Visiting wind installations in Lempster; Lowville, New York; Mars Hill, Maine; and Searsburg, Vermont; I was severely disturbed by the turbine noise. I work at home, both indoors and out, and would simply find that kind of perpetual noise intolerable. I have specifically viewed and listened to turbines at these locations from the same distance as our house is from the proposed Tuttle Hill site.

Q: Do you have concerns about the effects of wind turbines on your family's health?

A: While I am certainly aware that ill health effects are denied by the industrial wind industry, I feel there are too many legitimate claims of poor health from those living in proximity to turbines to be ignored. Placing three megawatt turbines so close to houses is definitely a reason for alarm. Both my husband and myself have

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pre-existing health conditions that are documented to be exacerbated by the effects of wind turbines. (See Exhibit LB8: Letter from Dr. Nina Pierpont)

Q: Do you have concern for your property value?

A: While property values may be of concern to many, our concern is that we simply do not want to leave our property. We love our land and have no desire to live elsewhere. Rich will retire in two years and our plan has always been to build a smaller cabin further into the woods and give our house to our son. For several years in the 1990s, Rich and I managed the ski touring center at Temple Mountain in Peterborough. We are both professionally certified XC ski instructors and our intent has always been to open our 230 acres of land for XC skiing in the winter where we could teach lessons to supplement our retirement income. Additionally we have a well-established kennel of Siberian Husky sled dogs. We have planned to offer dog cart rides and sled tours on these trails as well.

To this end, we have begun a forestry plan with intent to lay out road and trails to access the more remote areas of our land. However, none of this would be feasible with ten massive industrial wind turbines in close proximity.

Q: How would this project thus affect you personally?

A: I have spent my entire life living in the country and a very significant amount of time camping in remote areas. Rich and I have always been concerned about our "footprint" and are very conservative with our energy usage. We have a south-facing passive solar house which we heat supplementally with small, efficient woodburning stoves. Our house is very cool in the winter by most standards. This is our chosen lifestyle and we are both proud of and comfortable with it.

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It is abundantly clear to me that the visual impact of ten monstrous turbines would totally destroy the sanctity of our home. We would see these turbines from our kitchen, living room, and sleeping quarters. Since we depend on passive solar heating, we have ten foot sliding glass doors in the kitchen and an eight foot window in our living room. We now see no other homes or lights from our property and although we have let some trees grow in our viewshed to block the potential possibility of a house built on Tuttle Hill, we can certainly never block the view of 500-foot turbines nor flashing red lights. Combining the visuals with the sound impact, the result would simply be intolerable for us.

Q: What reasons do you see to deny this project?

A: According to "Renewable Energy in the Northern Forest", a 2011 report written by Ann Ingerson for the Wilderness Society:

"Aside from impacts to the remaining undeveloped parts of the landscape due to the footprint of turbine clearings, access roads, and transmission lines, other major impacts of wind energy development include:

- Harm to migrating birds and bats;
- Disruption and fragmentation of habitat for interior forest and high elevation species;
- Erosion from access roads and cleared power lines;
- Pollution from oils used to lubricate gear boxes and other moving parts;
- Effects of turbine noise, visual flicker, and aesthetic impacts on surrounding residents."

As proponents of energy conservation and renewable technologies, we are not against properly sited wind projects and are particularly in favor of small-scale, distributed wind. However this proposed commercial-scale AWE project is totally inappropriate for this site for aesthetic, human health, and natural resource reasons. The turbines are far too large to be placed in such a small area so close to many residences. This Tuttle-Willard Ridge has been protected by our Rural Conservation Zoning for the past 23 years. It is a unique area with significant wildlife habitat and

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wonderful geological features that adjoins the most gorgeous, pristine pond and wildlife sanctuary in southern New Hampshire. Additionally, it's centrally located in a major collaborative of conserved lands that has been an ongoing, expanding effort for many organizations over the last several decades. Coupling this unique site with Antrim Wind's lack of practical expertise renders this project completely unsuitable for approval.

Exhibit LB1

Antrim Wind application to the Antrim Zoning Board of Adjustment July 8, 2009

P.O. BOX 517 ANTRIM, NEW HAMPSHIRE 03440

(603) 588-6785

APPLICATION FOR APPEAL

ZBA File # <u>2009-022BA</u> Date Received (for office use c	7/8/09 + 7 only)	10/05 By Dane Chance
1. Name & address of applicant:		The colors of starts indiate start of
Antrim Wind Energy, LLC	uta vasto	he met tower is a temp
155 Fleet Street Portsmouth, NH 03801	_Phone #:	(603) 570-4842
2. Name & address of owner(s) of record (if other than appl	icant):	Michael J Ott
354 Keene Road	301 00 200	ubmo visiopristati principi
Antrim, NH 03440	Phone #:	(954) 614-5128
3. Location of property: Off High Range Road on the North East	tip of Tuttle H	lill ridge
4. Zoning District: Rural Conservation Tax Map #	212	Lot # 030-000
NOTE: Fill in Section 1, 2 or 3 as appropriate. This application statements have been made. Additional information may be space provided is not adequate.		
SECTION 1: APPEAL FROM AN ADMINISTRATIVE DECI Relating to the interpretation and enforcement of the provision Decision of the enforcement officer or Board to be reviewed:	ons of the zo	oning ordinance.
The met tower is 197.8 feet tall and requires a Variance	14thu . yuzh	' aachte tar the application p
esser to gathat and evaluate who recourse data	2060 B) 199	
		Date:
Article: XIV-D Section: D - 1-b of the zoning	ordinance in	n question:
n no situation shall the tower height exceed 150 feet	ofine parent	Init cus laws anothings is
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SECTION 3: APPLICATION FOR A USE OR AREA VARIANCE

A variance is requested from . Icle XIV -D Section D -1 -

Section D-1-b of Jzoning ordinance

to permit A temporary met tower of 197.8 feet to be installed to collect wind resource data

5 Criteria To Be Met To Grant This Request (Use Additional Sheets If Necessary):

1. The value of surrounding properties will not be diminished because:

The met tower is a temporary structure, not exceed three years

2. The variance will not be contrary to the public interest because:

The met tower is temporary, produces no noise, is in a remote location, and will follow all public safety

requirements

FOR AN AREA VARIANCE:

3. Special conditions exist such that literal enforcement of the ordinance results in unnecessary hardship as follows:

A) An area variance is needed to enable the applicant's proposed use of the property given the special conditions of the property because:

The proposed location and height allows the Owner access to optimal wind resources on the property

B) The benefit sought by the applicant cannot be achieved by some other method reasonably feasible for the applicant to pursue, other than an area variance because:

A 60 meter (197.8 foot) met tower is necessary to gather and evaluate wind resource data

FOR A USE VARIANCE:

3. Special conditions exist such that literal enforcement of the ordinance results in unnecessary hardship as follows:

A) The zoning restriction as applied interferes with a landowner's reasonable use of the property, considering the unique setting of the property in its environment because:

FOR A USE VARIANCE (CONT.):

3. B) No fair and substantial relationship exists between the general purposes of the zoning ordinances and the specific restrictions on the property because:

C) The variance would not injure the public or private rights of others because:

4. Granting the variance would do substantial justice because:

1

C-44

5. The variance is consistent with the spirit of the ordinance because:

APPNCANT SIGNATURE (REQUIRED)
Applicant: M. Jack Kenhorthy Date: 7709
for Antrin Wind Energy LLC
AGENT AUTHORIZATION (IF APPLICABLE)
I authorize <u>ANTRTM WIND ENERGY LLC</u> to act as my agent and represent me before the Antrim Zoning Board of Adjustment;
Date: 7/7/04
Signed: 32 1 COtt
V

"I hereby authorize the Antrim Zoning Board of Adjustment and its agents to access my land for the purpose of reviewing this proposal, performing inspections deemed necessary by the Board or its agents to ensure conformance of the on site improvements and the approved plan and all Town of Antrim ordinances and regulations"

Date:	7/7/	09			
Signed:	Her	2	ækt.	 	

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Exhibit LB2

Antrim Zoning Ordinance, Article XIV-D, Small Wind Energy Systems (emphasis added)



Town of Antrim, New Hampshire

P.O. Box 517, 66 Main St. Antrim, NH 03440

Phone: (603) 588-6785 Fax: (603) 588-2969

Article XIV-D Small Wind Energy Systems

ARTICLE XIV-D SMALL WIND ENERGY SYSTEMS (Adopted March 10, 2009)

A. <u>Purpose</u>:

This small wind energy systems ordinance is enacted in accordance with RSA 674:62-66, and the purposes outlined in RSA 672:1-III-a. The purpose of this ordinance is to accommodate small wind energy systems in appropriate locations, while protecting the public's health, safety and welfare. In addition, this ordinance provides a permitting process for small wind energy systems to ensure compliance with the provisions of the requirements and standards established herein.

B. <u>Definitions:</u>

Meteorological tower (met tower). Includes the tower, base plate, anchors, guy wires and hardware, anemometers (wind speed indicators), wind direction vanes, booms to hold equipment for anemometers and vanes, data loggers, instrument wiring, and any telemetry devices that are used to monitor or transmit wind speed and wind flow characteristics over a period of time for either instantaneous wind information or to characterize the wind resource at a given location. For the purpose of this ordinance, met towers shall refer only to those whose purpose are to analyze the environmental factors needed to assess the potential to install, construct or erect a small wind energy system.

Modification. Any change to the small wind energy system that materially alters the size, type or location of the small wind energy system. Like-kind replacements shall not be construed to be a modification.

Net metering. The difference between the electricity supplied to a customer over the electric distribution system and the electricity generated by the customer's small wind energy system that is fed back into the electric distribution system over a billing period.

Power grid. The transmission system, managed by ISO New England, created to balance the supply and demand of electricity for consumers in New England.

Shadow flicker. The visible flicker effect when rotating blades of the wind generator cast shadows on the ground and nearby structures causing a repeating pattern of light and shadow.

Small wind energy system. A wind energy conversion system consisting of a wind generator, a tower, and associated control or conversion electronics, which has a rated capacity of 100 kilowatts or less and will be used primarily for onsite consumption.



System height. The vertical distance from ground level to the tip of the wind generator blade when it is at its highest point.

Tower. The monopole, guyed monopole or lattice structure that supports a wind generator.



Tower height. The height above grade of the fixed portion of the tower, excluding the wind generator.

Wind generator. The blades and associated mechanical and electrical conversion components mounted on the tower whose purpose is to convert kinetic energy of the wind into rotational energy used to generate electricity.

C. <u>Procedure for Review:</u>

1. Building Permit: Small wind energy systems and met towers are an accessory use permitted in all zoni districts where structures of any sort are allowed. No small wind energy system shall be erected, constructed installed without first receiving a building permit from the building inspector. A building permit shall be rector any physical modification to an existing small wind energy system. Met towers that receive a building p shall be permitted on a temporary basis not to exceed 3 years from the date the building permit was issued.

2. Application: Applications submitted to the building inspector shall contain a site plan with the followir information:

- i) Property lines and physical dimensions of the applicant's property.
- ii) Location, dimensions, and types of existing major structures on the property.
- iii) Location of the proposed small wind energy system, foundations, guy anchors and associated equipment.
- iv) Tower foundation blueprints or drawings.
- v) Tower blueprints or drawings.
- vi) Setback requirements as outlined in this ordinance.
- vii) The right-of-way of any public road that is contiguous with the property.
- viii) Any overhead utility lines.

ix) Small wind energy system specifications, including manufacturer, model, rotor diameter, tower height, tower type, nameplate generation capacity.

x) Small wind energy systems that will be connected to the power grid shall include a copy of the application for interconnection with their electric utility provider.

xi) Sound level analysis prepared by the wind generator manufacturer or qualified engineer.

xii) Electrical components in sufficient detail to allow for a determination that the manner of installation conforms to the NH State Building Code.

xiii) Evidence of compliance or non-applicability with Federal Aviation Administration requirements.

xiv) List of abutters to the applicant's property.

3. Abutter and Regional Notification: In accordance with RSA 674:66, the building inspector shall notify all abutters and the local governing body by certified mail upon application for a building permit to construct a small wind energy system. The public will be afforded 30 days to submit comments to the building inspector prior to the issuance of the building permit. The building inspector shall review the application for regional impacts per RSA 36:55. If the proposal is determined to have potential regional impacts, the building inspector shall follow the procedures set forth in RSA 36:57, IV.

D. Standards:

1. The building inspector shall evaluate the application for compliance with the following standards;

a. Setbacks: The setback shall be calculated by multiplying the minimum setback requirement number by the system height and measured from the center of the tower base to property line, public roads, or nearest point on the foundation of an occupied building.

Minimum Setback Requirements				
Occupied Buildings on Participating Landowner Property	Occupied Buildings on Abutting Property	Property Lines of Abutting Property and Utility Lines	Public Roads	
0	1.5	1.1	1.5	

i) Small wind energy systems must meet all setbacks for principal structures for the zoning district in which the

system is located.

- ii) Guy wires used to support the tower are exempt from the small wind energy system setback requirements.
- b. Tower: The maximum tower height shall be restricted to 35 feet above the tree canopy within 300 feet of the small wind energy system. In no situation shall the tower height exceed 150 feet.

c. Sound Level: The small wind energy system shall not exceed 60 decibels using the A scale (dBA), as measured at the site property line, except during short-term events such as severe wind storms and utility outages.

- d. Shadow Flicker: Small wind energy systems shall be sited in a manner that does not result in significant shadow flicker impacts. Significant shadow flicker is defined as more than 30 hours per year on abutting occupied buildings. The applicant has the burden of proving that the shadow flicker will not have significant adverse impact on neighboring or adjacent uses. Potential shadow flicker will be addressed either through siting or mitigation measures.
- e. Signs: All signs including flags streamers and decorative items, both temporary and permanent, are prohibited on the small wind energy system, except for manufacturer identification or appropriate warning signs.
- f. Code Compliance: The small wind energy system shall comply with all applicable sections of the New Hampshire State Building Code.
- g. Aviation: The small wind energy system shall be built to comply with all applicable Federal Aviation Administration regulations including but not limited to 14 C.F.R. part 77, subpart B regarding installations close to airports, and the New Hampshire Aviation regulations, including but not limited to RSA 422-b and RSA 424.
- h. Visual Impacts: It is inherent that small wind energy systems may pose some visual impacts due to the tower height needed to access wind resources. The purpose of this section is to reduce the visual impacts, without restricting the owner's access to the optimal wind resources on the property.

i) The applicant shall demonstrate through project site planning and proposed mitigation that the small wind energy system's visual impacts will be minimized for surrounding neighbors and the community. This may include, but not be limited to information regarding site selection, wind generator design or appearance, buffering, and screening of ground mounted electrical and control equipment. All electrical conduits shall be underground, except when the financial costs are prohibitive.

ii) The color of he small wind energy system shall be a non-reflective, unobtrusive color that blends in with the surrounding environment. Approved colors include but are not limited to white, off-white, grey or black.
iii) A small wind energy system shall not be artificially lit unless such lighting is required by the Federal Aviation Administration (FAA). If lighting is required, the applicant shall provide a copy of the FAA determination to establish the required markings and/or lights for the small wind energy system.

- i. Utility Connection: If the proposed small wind energy system is to be connected to the power grid through net metering, it shall adhere to RSA 362-A:9.
- j. Access: The tower shall be designed and installed so as not to provide step bolts or a ladder readily accessible to the public for a minimum height of 8 feet above the ground. All ground-mounted electrical and control equipment shall be labeled and secured to prevent unauthorized access.
- k. Clearing: Clearing of natural vegetation shall be limited to that which is necessary for the construction, operation and maintenance of the small wind energy system and as otherwise prescribed by applicable laws, regulations, and ordinances.
- E. <u>Abandonment</u>:
- 1. At such time that a small wind energy system is scheduled to be abandoned or discontinued, the applicant will notify the building inspector by certified U.S. mail of the proposed date of abandonment or discontinuation of operations.

- 2. Upon abandonment or discontinuation of use, the owner shall physically remove the small wind energy system within 90 days from the date of abandonment or discontinuation of use. This period may be extended at the request of the owner and at the discretion of the building inspector. "Physically remove" shall include, but not be limited to:
- a. Removal of the wind generator and tower and related above-grade structures.
- b. Restoration of the location of the small wind energy system to its natural condition, except that any landscaping, grading or below-grade foundation may remain in its same condition at initiation of abandonment.
- 3. In the event that an applicant fails to give such notice, the system shall be considered abandoned or discontinued if the system is out-of-service for a continuous 12-month period. After the 12 months of inoperability, the building inspector may issue a Notice of Abandonment to the owner of the small wind energy system. The owner shall have the right to respond to the Notice of Abandonment within 30 days from Notice receipt date. After review of the information provided by the owner, the building inspector shall determine if the small wind energy system has been abandoned. If it is determined that the small wind energy system has not been abandoned, the building inspector shall withdraw the Notice of Abandonment and notify the owner of the withdrawal.
- 4. If the owner fails to respond to the Notice of Abandonment or if, after review by the building inspector, it is determined that the small wind energy system has been abandoned or discontinued, the owner of the small wind energy system shall remove the wind generator and tower at the owner's sole expense within 3 months of receipt of the Notice of Abandonment. If the owner fails to physically remove the small wind energy system after the Notice of Abandonment procedure, the building inspector may pursue legal action to have the small wind energy system removed at the owner's expense.

F. <u>Violation</u>:

It is unlawful for any person to construct, install, or operate a small wind energy system that is not in compliance with this ordinance. Small wind energy systems installed prior to the adoption of this ordinance are exempt from this ordinance except when modifications are proposed to the small wind energy system.

G. <u>Penalties</u>:

Any person who fails to comply with any provision of this ordinance or a building permit issued pursuant to this ordinance shall be subject to enforcement and penalties as allowed by NH Revised Statutes Annotated Chapter 676:17.

Exhibit LB3

Antrim Zoning Ordinance, Article IX, Rural Conservation District



Town of Antrim, New Hampshire

P.O. Box 517, 66 Main St. Antrim, NH 03440

Phone: (603) 588-6785 Fax: (603) 588-2969

Article IX - Rural Conservation District (RC) (Adopted March 14, 1989)

ARTICLE IX - RURAL CONSERVATION DISTRICT (RC) (Adopted March 14, 1989)

A. Purpose

The Rural Conservation District is intended to protect, conserve and preserve the remote mountainous portions of Antrim from excessive development pressures and/or activities that would be detrimental to the unique environmental characteristics and qualities of this district and detract from the peaceful enjoyment and tranquillity that this district affords local residents.

B. <u>Permitted Uses</u>

- 1. <u>Principal permitted uses</u>:
 - a. Single-family dwellings.
 - b. Duplex dwellings (Deleted March 10, 2005)
 - c. Public and private schools (all levels)
 - d. Churches (see Article XIV Supplemental Regulations)
 - e. Public utilities
 - f. Home-based businesses (see Article XIV Supplemental Regulations)
 - g. Kennels, boarding and/or breeding
 - h. Public and private recreational facilities

Farms and agricultural activities excluding pelt ranching and raising of more than twenty (20) swine

- j. Roadside stands
- k. Stables and riding academies
- 1. Farm employee housing (see Article XIV Supplemental Regulations)

Manufactured Housing Units (See Article XIV, Section W)(Adopted March 13, 2001)

Personal Wireless Service Facilities (Amended March 13, 20120

2. Accessory uses:

- a. Any use accessory to a principal permitted use
- b. Signs as permitted in Article XVII
- c. Fences as permitted in Article XVI
- d. Parking and loading facilities as permitted in Article XV
- e. Storage or parking of major recreation equipment as permitted in Article XIV

Private swimming pools, tennis courts and greenhouses as permitted in Article XIV (Adopted March 9, 1993)

- g. Retail sales of antiques, arts and crafts, handiwork and garden produce when an accessory use to a residence (Site Plan Review required)
- 3. Special Exception uses:
 - a. Multi-family dwellings (Site Plan Review required) (Deleted March 10, 2005)
 - b. Bed and breakfast establishments
 - c. Recreational vehicle park
 - d. Manufactured housing parks

Raising animals for their pelt or pelt ranches (Adopted March 9, 1993)

f. Accessory Living Units (Adopted March 9, 2004) (See Article XIV)

C. Lot and Area Requirements

1. Minimum: 130,000 square feet.

Minimum lot frontage: 300 feet.

3. Minimum lot depth: 300 feet.

Minimum front yard setback: 75 feet.

- 5. Minimum side yard setback: 50 feet each side.
- 6. Minimum rear yard setback: 50 feet.

Maximum lot coverage: 25 percent.

8. Maximum height for all buildings: 2 1/2 stories or 35 feet, whichever is less.

Back Lots (See Article XIV Supplemental Regulations)

Updated 4/2/2012

Exhibit LB4

Antrim Open Space Conservation Plan, Excerpt Map: Antrim Open Space Protection Priorities

Antrim Open Space Committee

Open Space Conservation Plan for Antrim

FINAL REPORT

To the Antrim Selectmen

November 11, 2005

Executive Summary

The Antrim Selectmen appointed the Antrim Open Space Committee in the fall of 2004 with the following purpose:

To develop an Open Space Plan for Antrim that explores usays to preserve and enhance our open spaces, in conjunction with the development that is now taking place in our town, so as to protect the character of Antrim into the future. The plan will include recommendations for the permanent protection of priority open space areas in town, the suggested methods to accomplish this, and the probable cost and benefits associated with this open space protection.

Two recent publications help put Antrin's growth situation in context and the work of the Open Space Committee in perspective. *New Hampshire's Changing Landscape*¹ describes how rapidly New Hampshire is growing. Some key findings from that work confirm what we have started to see in Antrim in recent years:

- from 1990-2004, NH's population grew 17.2%, far outpacing any other state in the Northeast. The state's population is expected to grow more than 28% more by 2025 and 80% of this growth will occur in the Hillsborough, Merrimack, Rockingham and Strafford counties;
- New Hampshire is losing about 17,500 acres of forestland to development each year (about the size of a town in NH);
- NH is losing high quality familand at a rapid pace Rockingham County lost onethird of its familand from 1997-2002 alone;
- In 1970, 139 towns in NH were classified as rural and by 2025, this number will have dropped to 72.

These data show that New Hampshire is changing rapidly and we, in Antrim, cannot assume we will not change along with the rest of the state. Implementing the Open Space Plan assures we will have some say in how we change and in keeping what is special in our town.

A second publication brings some good news in a sense. Managing Growik: The Impact of Conservation and Development on Property Taxes in New Hampshire², says, clearly, that permanent land conservation is good for the pocketbook, tax-wise. It shows that communities with more land permanently conserved have lower property tax rates. Other studies called *cost of community services* show that taxes paid on undeveloped land more than pays for the services required on those lands.

A key component of the Open Space Conservation Plan for Antrim is the Natural Resource Inventory (NRI) that was completed. Essential digital maps and data were developed to understand what natural resources are special in town, forming the basis for making decisions about priority areas to conserve.

¹ Society for the Protection of New Hampshire Parests, **ZHE** available at www.forestsociety.org.

² The Trust for Public land, 2005, available at www.tpl.org.newhampshire.

Open Space Conservation Plan for Anixim Final Report 11/8/05

As part of the Committee work, residents of Antrim were asked to participate in the process of developing a plan and did so enthusiastically. A written and web-based survey was initiated and two public meetings were conducted to hear what people in town feel is important to conserve.

After taking all the NRI and public comment info into account, the Open Space Committee developed the following priorities for permanent land conservation in Antrim:

Criteria -

- add to protected land to add to protected land enhances all the values already protected by these landscapes
- aquifers to protect drinking water supplies
- > riparian areas (streams and lakes) to assure recreation resources and wildlife habitat
- > agricultural land to provide food, rare diversity, habitat mosaic
- > corridors to allow for wildlife movement from one conserved area to another
- > unfragmented forest lands to provide a diversity of habitat for wildlife
- scenic values to enhance the aesthetic qualities & recreation values of the landscape for tourism
- historic lands to connect us to our roots, and provide for education & our cultural heritage

Based on these criteria, the following areas of Antrim are recommended for permanent land conservation:

1. Adding to protected land:

- west Antrim
- Campbell Pond/East Antrim
- Gregg Lake/Central Antrim
- McCabe
- 2. Aquifers:
 - southern Contoocook
 - northern Contoocook
- 3. Riparian areas:
 - Contoocook River Corridor
 - Campbell Pond outflow (Cochran Brook)
 - North Branch/Steele Pond
 - Gregg Lake
 - Great Brook
 - Willard Pond
- 4. Agricultural land (along the Contoocook River corridor)

Open Space Conservation Plan for Antrim Final Report 11/8/05

Page 4

5. Wildlife corridors

- Cochran Brook (Campbell Pd. South)
- West Antrim the large block connecting with adjacent towns
- (Previously Denison) Pond to Contoocook
- Riley Mt. to Contoocook

6. Unfragmented forestlands

- West Antrim
- Campbell Pond south
- Gregg Lake west

7. Scenic areas

- other areas listed above that are accessible to people
- consideration for entry points to town
- 8. Historic lands
 - Meetinghouse Hill
 - Greystone Lodge area

The Committee recommends that the primary tool that should be used to assure permanent conservation of these key areas in Antrim is **conservation easements** (permanent deeds restricting what can occur on land). This tool should be used only in a willing seller/willing buyer scenario. The decision to place a conservation easement on land in town should be solely up to the private landowner.

The priority areas listed above represent thousands of acres in Antrim. Using a combination of conservation easement donations and purchases, it is estimated that this effort will cost substantial sums over the next 20 years. These funds need to come from many sources – federal, state, town and private – in order for the task to be successful. A town bond to begin this work will be requested at town meeting in 2006.

The Open Space Committee met monthly since being appointed in the late fall of 2004. The Members of the Committee were:

Linda Bundy Melissa Chapman Robert Edwards Marshall Gale Gil Geisz Ben Pratt Eric Tenney Rod Zwirner Loranne Carey Block Charles Levesque, Chair

Open Space Conservation Plan for Antrim Final Report 11/8/05

A set of land conservation criteria from which specific land conservation priority decisions would be made were developed. The reason for the criteria (the objective of protecting this kind of land) is listed after each criteria. They are:

- add to protected land to add to protected land enhances all the values already protected by these landscapes
- aquifers to protect drinking water supplies
- > riparian areas (streams and lakes) to assure recreation resources and wildlife habitat
- > agricultural land to provide food, rare diversity, habitat mosaic
- > corridors to allow for wildlife movement from one conserved area to another
- > unfragmented forest lands to provide a diversity of habitat for wildlife
- scenic values to enhance the aesthetic qualities & recreation values of the landscape for tourism
- historic lands to connect us to our roots, and provide for education & our cultural heritage

Based on these criteria, the following areas of Antrim are recommended for permanent land conservation (also see map on Page 20):

1. Adding to protected land:

- West Antrim the large unfragmented and remote area west of Gregg Lake to the northern boundary of the town.
- Campbell Pond/East Antrim the unfragmented area surrounding Campbell Pond.
- Gregg Lake/Central Antrim west and east shores of Gregg Lake including Patten Hill area to the east.
- McCabe Forest area surrounding the Forest Society McCabe Forest in east Antrim.
- 2. Aquifers:
 - southern Contoocook land area east of Route 202 south of the Elm Ave & Route 202 intersection along the Contoocook River.
 - northern Contoocook land area east of Route 202 from the Hillsborough border south to the Elm Ave. intersection of Route 202.
- 3. Riparian areas:
 - Contoocook River Corridor the entire western shore of the Contoocook River in Antrim.
 - Campbell Pond outflow (Cochran Brook) the stream flowage area from Campbell Pond to the Contoocook River.
 - North Branch/Steele Pond area immediately adjacent to the North Branch of the Contoocook River in North Antrim.
 - Gregg Lake Lake shore area.
 - Great Brook Great Brook flowage through town.
 - Willard Pond those few areas surrounding Willard Pond in south Antrim that are not already permanently conserved.

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4. Agricultural land (along the Contoocook River corridor) – the farmland in and near the floodplain of the Contoocook River east of Route 202.

- 5. Wildlife corridors
 - Cochran Brook (Campbell Pd. South) same as the Cochran Brook drainage described above.
 - West Antrim the large block of remote lands connecting with adjacent towns west of Gregg Lake.
 - (Previously Denison) Pond to Contoocook East Antrim drainage to the Contoocook River.
 - Riley Mt. to Contoocook -
- 6. Unfragmented forestlands
 - West Antrim see above for description.
 - Campbell Pond south the area immediately surrounding Campbell Pond.
 - Gregg Lake large area surrounding Gregg Lake to east and west.
- 7. Scenic Areas
 - other areas listed above that accessible to people
 - consideration for entry points to town from Route 202 in the north and south.
- 8. Historic lands
 - Meetinghouse Hill north of Antrim Grange.
 - Greystone Lodge area near the Hancock border in the southeast part of town.

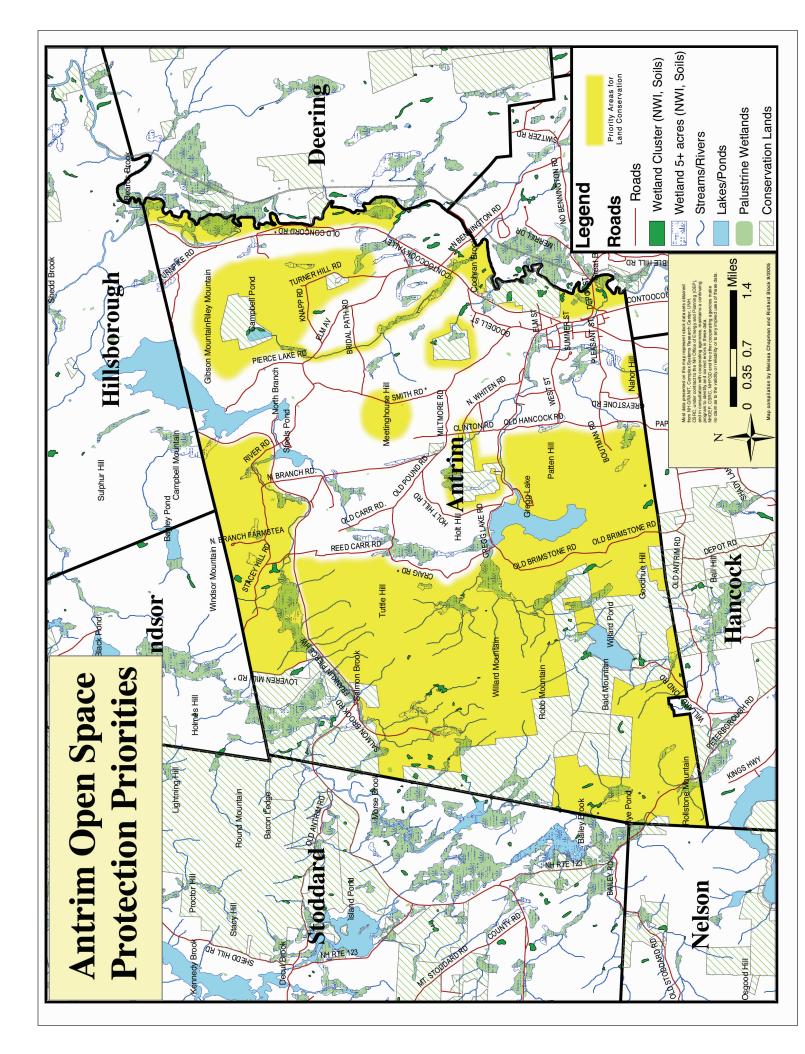


Exhibit LB5

Antrim Master Plan, Excerpt

Future Land Use

Introduction

In the master plan update of 2001 it was suggested that setting clear development policies rather than specific objectives would be appropriate since future growth was not anticipated to be large. In 2009 we now know that growth is indeed accelerating and is projected to increase in the southern tier counties of the state in the future. In order to implement the citizens' vision that Antrim retain its rural and small town character, it requires that the Planning Board look at and plan for the specific needs required to control and support anticipated growth. We have seen this to be the case in the Planning Board actions with respect to subdivision and site plan review of applications. Specifically, questions have arisen regarding the issue of private versus town roads, the need for fire ponds and other fire protection devices, the ability of existing town roads to support the increase in traffic, and the capacity of existing town services to support new growth.

As the amount of available land suitable for development decreases and the price for such land increases, the task of balancing the desire to preserve open space and at the same time protect the rights of property owners requires that we examine new ways of accommodating development. Antrim's implementation of "Smart Growth Principles" in the planning process and the establishment of Open Space and Growth Committees are positive steps in this direction.

Antrim is not alone in trying to deal with these issues. Both at the state and regional levels there are a growing number of resources dedicated to promoting managed and conservation-friendly development while at the same time preparing local communities to deal with the impact that such growth brings.

Purpose of the Future Land Use Section

The purpose of the Future Land Use Section of the master plan is spelled out in RSA 674:2 II (b) which requires the master plan to include, "A land use section ...[that addresses] the proposed location, extent, and intensity of future land use." While addressing future land use topics this section will provide guidance to the Planning Board for the establishment of ordinances and regulations that will guide development in Antrim as envisioned by its citizens.

The plan is intended to achieve the following results:

- i. Protect Antrim's valuable natural resource areas by directing future growth toward land that can accommodate it.
- ii. Provide adequate areas for light industrial, commercial, residential, and public service (infrastructure) growth.

- iii. Encourage the protection of open space in unfragmented forest lands, wildlife corridors, scenic and historic areas. (See Open Space Conservation Plan for Antrim, September 26, 2005, Appendix 2.)
- iv. Protect and preserve Antrim's rural and small town character.
- v. Provide incentives to create a range of housing types for a range of household incomes.
- vi. Direct higher density development toward areas with existing infrastructure (highways, roads, utilities) in order to minimize the cost of providing public services.

Growth Trends

As much as many people might like our communities in New Hampshire to stay exactly the way they are, forecasts indicate that the population is likely to continue to increase, and the courts have indicated that each community has to accept its fair share of that growth. We can't build walls around our communities to keep these new arrivals out, and growth can be a good thing. New members of our communities may bring new ideas, new energy, and volunteers for our local government and boards. Improperly managed growth, however, can change the nature and feel of a community.

Forecast for Antrim

The NH Office of Energy and Planning (OEP) reported that Antrim had a population of approximately 2,455 people in 2000 and estimates that Antrim's population increased to 2,626 by 2007. It estimates that by 2030 that number will have increased by approximately 20% to 2,940. Similarly, it is likely that Antrim will receive additional non-residential (commercial/industrial) growth over the next twenty years. For planning purposes, it is assumed that Antrim could receive as little as 50,000 square feet of commercial and industrial space, or as much as 300,000 square feet or more of retail space over the next twenty years depending on local regulations and market forces.

Development Potential

TOTAL LAND AREA:		23,367 ACRES
Minus:	Wetlands	1,592.1 acres
	Steep Slopes (>15%)	10,170.0 acres
	Floodplain	2,539.0 acres
	Developed Land	3,962.0 acres
Total Undevelopable Land		18,263.1 acres
TOTAL LAND AVAILABLE FOR DEVELOPMENT:		5,103.9 ACRES

Apart from the actual number of acres of readily developable land remaining in town, the master plan needs to look at the type and density of development to determine the most effective use of this diminishing resource. This would include consideration of multi-family, open space cluster development, and townhouse units in addition to the traditional single family residence on two plus acres. The same consideration must also apply to commercial development in the Residential and Highway Business zones, as well as delineating new or expanded commercial areas and uses in all districts. Additionally we must also realize that almost all development parcels include some areas of wetlands or other features which would be desirable to preserve through conservation. This reinforces the need to consider higher density uses which must be incorporated into the Antrim Zoning Ordinances.

Future Land Use – The Citizens' Vision

Results of Visioning Session

On August 24th, 2006 a future land use visioning session was conducted by Jeffrey H. Taylor and Associates, Inc. at the Town Hall. Common themes that emerged from the session were:

- i. For the town to pursue strategic conservation of open space based on the "Open Space Conservation Plan for Antrim".
- ii. To focus on opportunities to integrate new development into the south village.
- iii. Establish "nodes" of development in the Route 9 and 202 corridors rather than "strip" development.
- iv. Restrict "Big Box" retail development (stores exceeding 25,000 square feet)
- v. Encourage development of affordable (workforce) rural housing without overwhelming existing infrastructure, or altering the rural character of the community.

Preferred Development Zones

It is recommended that the town consider implementing preferred development zones to encourage development in areas that can accommodate it. Three general areas in town have been identified for potential focused development in order to accomplish the following:

- i. Balance competing interests while maintaining the integrity of the citizens' vision for Antrim.
- ii. Retain Antrim's "rural/small town character" by controlling growth, and directing it to targeted "development zones".
- iii. Keep Antrim affordable by encouraging commercial development that makes net positive contributions to the tax base.

Exhibit LB6

Q2C Fact Sheet Q2C Map — NH South



Q2C The Quabbin-to-Cardigan Partnership

A Public-Private Partnership Conserving the Monadnock Highlands of New Hampshire & Massachusetts

Launched in 2003, the Quabbin-to-Cardigan Partnership (Q2C) is a collaborative, landscape-scale effort to conserve the Monadnock Highlands of north-central Massachusetts and western New Hampshire. The two-state region spans one hundred miles from the Quabbin Reservoir northward to Mount Cardigan and the White Mountain National Forest, and is bounded to the east and west by the Merrimack and Connecticut River Valleys. Encompassing approximately two million acres, the Quabbin to Cardigan region is one of the largest remaining

areas of intact, interconnected, ecologically significant forest in New England, and is a key headwater of the

Merrimack and Connecticut rivers. The Q2C region's forests collect and naturally filter drinking water for nearly 200 cities and towns, including the City of Boston. Habitat conservation in the region is a high priority for both the Massachusetts and New Hampshire Wildlife Action Plans, and the region's interconnected forests could also prove an important north-south corridor for wildlife adapting their ranges to a changing climate. Its managed timberlands are an important source of forest products and renewable energy, and are a highly-efficient carbon sink. The region contains numerous public and private recreation areas and several well-maintained long-distance hiking trails, including a portion of the 190-mile Metacomet-Monadnock-Mattabesett Trail System, which is currently under consideration for National Scenic Trail designation.





The predominately rural Q2C region is a last frontier in the suburbanization of central New England (see Forests on the Edge, USFS, 2005). The Q2C's private forests are undergoing widespread subdivision into smaller tracts; some areas are already experiencing significant development and unsustainable timber harvesting. If present trends continue with no parallel effort to conserve large forest ownerships while they are still relatively intact, the result will be the irreversible fragmentation of the region's forests, and degradation of its exceptional habitat, watershed, recreational and economic values.



Conserving a Landscape, Working Together

The Quabbin-to-Cardigan Partnership is a collaborative effort of 27 private organizations and public agencies working on land conservation in the two Q2C states. The Q2C partners meet quarterly to coordinate public and private finance efforts, communications, conservation planning, and real estate transaction work–including reviewing projects seeking partnership endorsement. The Q2C Initiative does not protect land directly; its member organizations do. Land is conserved strictly on a willing-seller basis through a combination of conservation easements and land acquisitions,



managed by private owners, conservation organizations and public agencies. The Q2C partners share a vision of consolidating the permanent protection of the region's most ecologically significant forest blocks, and key connections between them for wildlife passage and human recreation. Q2C partners worked for more than three years to develop the Quabbin-to-Cardigan conservation plan, which combines state-of-the-art natural resource science and the consensus vision of the Q2C partner organizations. Completed in 2007, the Q2C plan has identified approximately 600,000 acres of core conservation focus areas that represent the region's most ecologically significant forests. These conservation focus areas represent about 30 percent of the two-million-acre region, and are currently 39 percent protected. An additional 400,000 acres, or another 21 percent of the region, have been identified as "supporting landscapes" that buffer and link the core areas, and are currently 26 percent protected.



What You Can Do

As a purely voluntary conservation effort, the Quabbin-to-Cardigan Partnership can succeed only with the help and support of landowners who love their land and wish to see it conserved. In some cases, tax incentives and funding opportunities may be available to help private landowners protect their land. To learn more about your conservation options, contact one of the Quabbin-to-Cardigan partners listed below. Together, we can ensure that the forested landscape of the Monadnock Highlands will be here for generations to come.

To Learn More:

In NH: Chris Wells, Society for the Protection of NH Forests Phone: (603) 224-9945 x355 Email: <u>cwells@forestsociety.org</u> In MA: Jay Rasku, North Quabbin Regional Landscape Partnership Phone: (978) 248-2118 Email: <u>info@ngpartnership.org</u>

Q2C partner organizations include the Appalachian Mountain Club, Audubon Society of New Hampshire, Ausbon Sargent Land Preservation Trust (NH), East Quabbin Land Trust (MA), Franklin Regional Council of Governments (MA), Harris Center for Conservation Education (NH), Harvard Forest (MA), Highstead, Land Trust Alliance, Massachusetts Audubon Society, Massachusetts Dept. of Fish & Game, Massachusetts Dept. of Conservation & Recreation, Monadnock Conservancy (NH), Montachusett Regional Planning Commission (MA), Mount Grace Land Conservation Trust (MA), The Nature Conservancy, New England Forestry Foundation, New Hampshire DRED - Division of Forests & Lands, New Hampshire Fish and Game Department, North County Land Trust (MA), North Quabbin Regional Landscape Partnership (MA), Society for the Protection of New Hampshire Forests, Southwest Region Planning Commission (NH), Trust for Public Land, The Trustees of Reservations (MA), Upper Valley Land Trust (NH), U.S. Fish & Wildlife Service.

> For downloadable maps and other information, visit <u>www.q2cpartnership.org</u>. Photo Credits: page 1: Jerry Monkman, Ecophotography.com; Page 2: Chris Wells

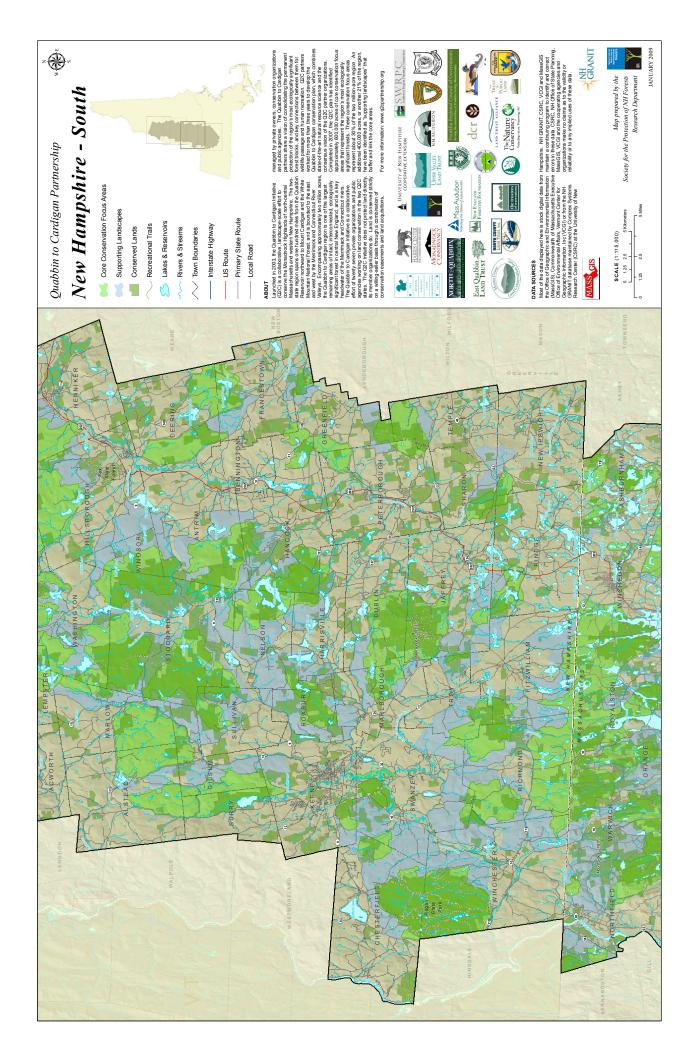


Exhibit LB7

2010 Highest Ranked Wildlife Habitat by Ecological Condition Map — Antrim

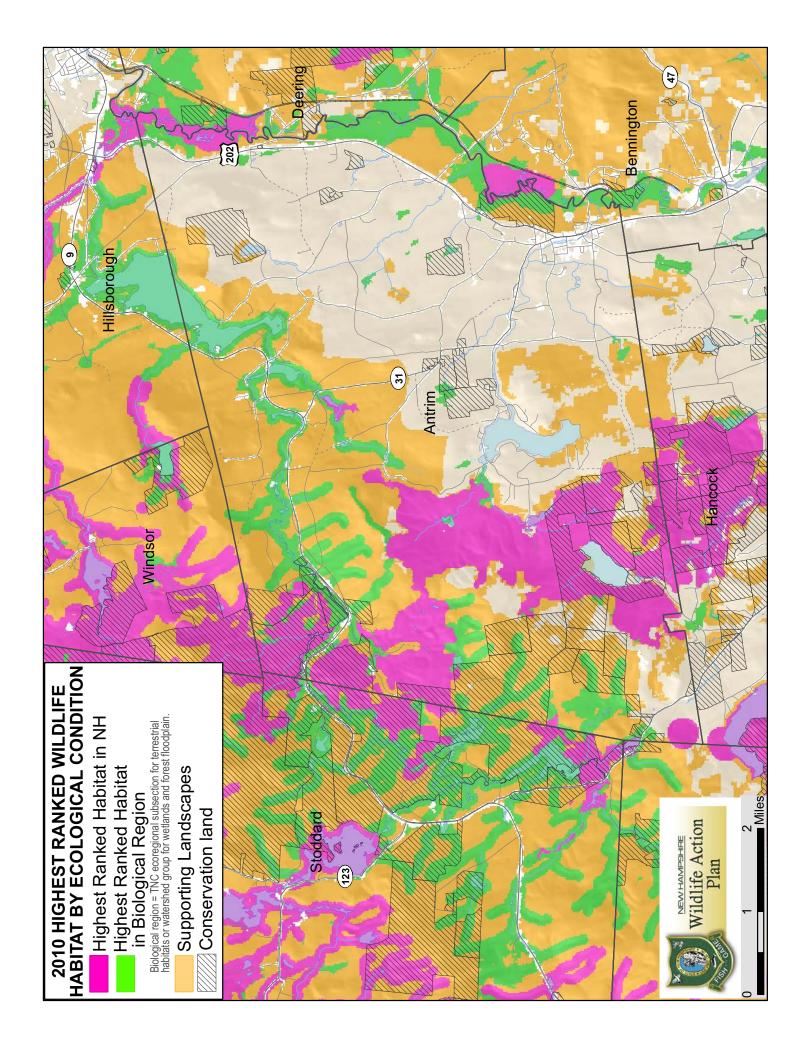


Exhibit LB8

Letter from Dr. Nina Pierpont

NINA PIERPONT M.D. PH.D.

19 Clay Street, Malone New York 12953

pierpont@westelcom.com

Letter from Dr. Pierpont to Loranne Carey & Richard Block Antrim, NH Re. Wind Turbine Syndrome

July 27, 2009

Dear Ms. Carey & Mr. Block,

Yes, there are indeed health problems caused by noise and vibration from current, upwind, three-bladed industrial wind turbines. I have completed a comprehensive report, which I am publishing as a peer-reviewed book next month, documenting the consistency of these problems from family to family.

My study subjects are a collection of families in several countries who have been driven from their homes by problems with sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, racing heart, irritability, and problems with concentration and memory, in both adults and children. Panic episodes associated with sensations of internal pulsation, or quivering, arise in the daytime or during sleep. The problems start when the turbines go into operation and resolve when the family is away from the turbines. Symptom intensity varies in concert with the type and loudness of noise, the direction turbine blades are turned, the rate of spin, and (for some people) the presence of shadow flicker. These problems all occur in proximity to recently built turbines, put into operation in 2004-2007. One of the families I studied lived 4900 ft and three others 3000-3300 ft from the closest turbines. Other families lived closer.

People disturbed by noise and vibration from industrial wind turbines generally can hear the noise when it bothers them, but many note that it may not seem especially loud. Several people I have interviewed speak favorably of living next to an elevated urban train line, compared to living in their rural home next to wind turbines. They can sleep with traffic or

Phone: (518) 483-6481 Fax: (518) 483-6481 train noise, but not with the wind turbine noise/vibration. They consistently describe a penetrating and intrusive quality to the wind turbine noise, many describing a sensation of vibration, quivering, or pulsation inside their bodies, especially the chest. These sensations are accompanied by very aversive feelings, including chest tightness, racing heart, jitteriness, anxiety, and compulsions to flee or check the environment for safety, including at night when awakened by such sensations. Young children have night terrors. People with these panic episodes did not have panic or anxiety before, but most of them were motion sensitive or had other difficulties with their balance systems before the turbines were built near their homes.

Published research from Sweden (doctoral thesis by Pedersen and published papers incorporated into the thesis¹) reports people to be *highly annoyed* by wind turbine noise at sound pressure levels much lower than for other types of community noise. The A-weighted decibel level (in a measure averaged and weighted over time, L_{eq}) which corresponds to 15% of the people being *highly annoyed* by the noise, is 38 dB(A) for wind turbines, 57 dB(A) for aircraft, 63 dB(A) for road traffic, and 70 dB(A) for railways. This is probably because A-weighted noise representations are not capturing the parts of the wind turbine noise and vibration spectrum which are disturbing. The curve for annoyance due to wind turbine noise has a steep slope, so that by 41 dB(A), 35% of people are *highly annoyed*. Sixteen percent of respondents over 35 dB(A) report that their sleep is disturbed by wind turbine noise.

The Pedersen studies are also based on modeled noise, not actual measurements, though the author says there is a close correlation between actual dB(A) measurements and the Swedish governmental modeling results. Even if we do not know exactly what parts of the noise and vibration spectrum are bothersome, and to what extent these are represented in a dB(A) measurement, we have in the Pedersen research clear evidence that when noise is modeled prior to wind turbine construction, the allowed levels of noise should not exceed 35 to 37 dB(A) outside of dwellings.

Based on my forthcoming book, "Wind Turbine Syndrome" (WTS), including interviews with scores of affected people around the world, it is my strong clinical recommendation (in line with the *French National Academy of Medicine*) that industrial wind turbines be sited a minimum of 1¹/₄ miles (2 km) away from homes, schools, hospitals, and other places where people sleep or learn.

¹ Pedersen E. 2007. Human response to wind turbine noise: perception, annoyance and moderating factors. Dissertation, Occupational and Environmental Medicine, Department of Public Health and Community Medicine, Goteborg University, Goteborg, Sweden.

Pierpont to Carey & Block

Wind Turbine Syndrome

7-27-09, p. 3

I would add that I have demonstrated in my book a significant statistical correlation between inner ear disease (including Meniere's) and high susceptibility to Wind Turbine Syndrome.

Sincerely,

Una Pierport

Nina Pierpont, MD, PhD