Wind Energy Project

Mount Wachusett Community College

Gardner, Massachusetts

Final Environmental Assessment

December 2009

DOE/EA# 1661

U.S. Department of Energy
Golden Field Office
National Renewable Energy Laboratory
1617 Cole Boulevard
Golden, CO 80401

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393
December 17th, 2009

DOE/EA 1661

FINDING OF NO SIGNIFICANT IMPACT FOR THE MOUNT WACHUSETT COMMUNITY COLLEGE WIND ENERGY PROJECT GARDNER, MASSACHUSETTS

AGENCY: Department of Energy, Golden Field Office

ACTION: Finding of No Significant Impact

SUMMARY: In accordance with the U.S. Department of Energy (DOE) National Environmental Policy Act (NEPA) implementing regulations, DOE prepared an Environmental Assessment (EA) that analyzed the potential impacts associated with the construction and operation of two proposed wind turbines at Mount Wachusett Community College (MWCC) in Gardner, Massachusetts.

DOE, through its Golden Field Office, proposes to provide congressionally directed federal funding to MWCC in support of the proposed installation, construction, and operation of two wind turbines and associated facilities. The project would generate electricity for MWCC, support its renewable energy curriculum, and offset the overall consumption of fossil fuels with renewable wind power. All discussion, analysis and findings related to the potential impacts of the project are contained in the Final EA. The EA evaluates the impacts of the No Action and the Proposed Action alternatives under the following impact areas: land use; aviation resources; wetland resources; avian resources; bat resources; electromagnetic interference; visual resources; shadow flicker; noise resources; and health and safety. The Final EA is hereby incorporated by reference.

The proposed action would consist of the installation and operation of one to two grid-connected megawatt scale wind turbine electric generators on its main campus in the City of Gardner, Massachusetts. The specific turbine model has not been identified but would be between 900 kilowatts (kW) and 2.0 megawatts (MW) each. The proposed turbines would be installed on steel monopole towers with a total height to the top of the blade arc a maximum of 415 feet above ground level (AGL).

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The College will obtain and adhere to all necessary permits as listed in the following Table.

Table 2-1_ Permits and Approvals		
Agency	**Permit/Approval**	**Status**
Federal Aviation Administration	Aeronautical Determination	Completed. Will be updated during preliminary design.
	Form 7460-2, Notice of Actual Construction or Alteration	To be submitted 10 days prior to construction.
U.S. Army Corps of Engineers	Section 404 of the Clean Water Act, PGP Category 1	Non-reporting Category. Application not required.
Massachusetts Aeronautics Commission	Request for Airspace Review	Application to be submitted during final design.
Massachusetts Board of Building Regulations and Standards	State building permit	Application to be submitted during final design.
MA Department of Environmental Protection	Section 401 Water Quality Certification.	Individual Application not required. Activity certified through the Section 404 PGP.
Gardner Conservation Commission (MA Wetlands Protection Act)	Determination of Applicability	Completed. Wetland Boundaries Approved
	Order of Conditions	Completed. Order of Conditions issued November 23, 2009

In accordance with applicable regulations and policies, DOE sent scoping notices to potentially interested federal, state, and local agencies, and published the notice in the local newspapers, the *Gardner News,* and *Telegram & Gazette*. The scoping letter described the Proposed Action and requested assistance in identifying potential issues that should be evaluated in the EA. Prior to the scoping notification, as part of the Feasibility Study prepared for the project, early coordination letters were sent to the U.S. Fish and Wildlife Service (USFWS), Massachusetts Natural Heritage and Endangered Species Program (NHESP), and the Massachusetts Historical Commission (MHC). In response to the scoping notice and early coordination, DOE received comments from USFWS, NHESP, MHC, Montachusett Regional Planning Commission, FAA, and one private citizen. The agencies did not object to the project, but raised general concerns about wildlife, siting, and aviation issues; asked questions about the project; and provided information for use in the EA. Final siting and design of the turbine was made in response to the comments expressed, specific questions raised were addressed in the EA, and information provided by agencies was used in the impact analysis.

DOE sent notices announcing the availability of the Draft EA for public comment to the same state, local, and federal agencies, representatives, businesses, and individuals that received the scoping notice. As part of the community outreach for the project, the College presented the

project on a local radio program, a local access TV station, and hosted a public open house information meeting in July. Approximately 150 abutters to the College campus received a letter about the open house and the availability of this DEA. The Draft EA was also made available for public review and comment on the DOE Golden Field Office reading room website and the MWCC website. No comments were received on the Draft EA.

DETERMINATION: Based on the information presented in this document and the analysis contained in the supporting Final EA (DOE/EA-1661), DOE determines that providing funding to support the construction and operation of the proposed wind turbines at MWCC in Gardner, Massachusetts would not constitute a major Federal Action significantly affecting the quality of the human environment, as defined by the National Environmental Policy Act. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary. The applicant-committed environmental protection measures identified in the Final EA shall be incorporated and enforceable through DOE's funding award to MWCC. These measures include:

- Electrical supply lines will be installed underground.
- Ground lighting of the turbine site will be limited to the turbine base (not the road) and full cut off fixtures will be specified to reduce potential for attraction of night migrating songbirds and other species. The lights will only be turned on at night as required for emergency maintenance or security patrols.
- FAA Advisory Circular AC70/7460-1K provides the standards for marking and lighting structures to promote aviation safety and the College will commit to following these standards:
    - Monopoles will be painted bright white.
    - The lighting for each turbine will include either a red flashing beacon (L-864) or a white strobe light (L-865) with the longest permissible off cycle (20 to 40 flashes per Minute (FPM).
    - The lights would be placed as high as possible on the turbine nacelle, so as to be visible from 360 degrees.
    - Steady burning red FAA lights will not be used.
- A Technical Advisory Committee (TAC) will be formed and headed by the College to ensure that all additional study protocols meet the recommendations of the Massachusetts Division of Fisheries and Wildlife (MADFW), USFWS, and other interested parties. The TAC will coordinate with interested parties to design post-construction mortality and acoustic study protocols. The minutes of the TAC meetings will be posted on the College's website. The TAC will also evaluate adaptive management techniques. The College will implement Adaptive Management procedures as part of their Operational Plan if the post construction studies identify significant levels of avian mortality
- The College will develop a campus-wide grounds management plan. This plan will evaluate and incorporate measures to enhance habitat for Bobolink and other grassland birds, and Yellow Watch List species such as Willow Flycatcher either at the project site or other appropriate areas on the campus.
- A mortality survey for birds will be conducted for one full operating year with a contingency for a 2nd year. The survey will be developed and conducted under the

technical guidance of the TAC. The survey report will be submitted to the TAC, which will include federal and state agency members.

- A mortality survey for bats will be conducted for one full operating year with a contingency for a 2nd year. The survey will be developed and conducted under the technical guidance of biologists experienced with fatality studies at wind turbine facilities.
- The College will implement Adaptive Management procedures if the post construction studies identify significant levels of bat mortality. For example, if it is found that the turbines are significantly impacting local bat populations, shutting down the turbines at low wind speed might reduce bat mortality to acceptable levels. The management options will have the goal to reduce mortality risk while minimally impacting project viability. Such adaptive management procedures would be designed by consultants working with the TAC.
- Final width of permanent access road will be 14 feet. After construction, the temporary crane pads, and temporary width of road will be restored to grass using a native seed mix or wetland using stockpiled wetland soils. Trees will be replanted elsewhere on the site to replace the trees cut along the campus drive.
- The Contractor will prepare an erosion control plan to protect wetland and grassland resources, as well as downstream drinking water supply, Crystal Lake.
- The College will comply with all conditions in the Order of Conditions issued by the Gardner Conservation Commission and will comply with all terms and Conditions for a Category 1, Non Reporting of the Department of the Army Programmatic General Permit for Massachusetts.
- The College will construct 2,600 SF of wetland replication as shown on the site base plan, Drawing C-1A.
- The Contractor will prepare a construction phase Health and Safety Plan for worker safety that complies with all state and federal standards.
- The College will develop an Operational Plan for the wind turbines that will include adaptive management for ice throw and shadow flicker. Ice throw can be managed either through automated control systems in the turbines which shut the turbines down when the Supervisory Control And Data Acquisition (SCADA) system senses blade weight imbalances due to icing and/or through a variety of ice prevention and ice melting technologies that can be applied to the blades. Decisions on specific ice throw mitigation strategies will be dependent on the turbine vendor selected. Having adequate solutions for ice through mitigation will be one criterion used in selection of the turbine manufacturer for the project.
- If the College receives complaints from residential property owners regarding the shadow flicker, the College is committed to programming the automated control system to shut down the turbines at the easily determined times such impact may occur.
- The College will obtain and adhere to all necessary permits.
- The College would contract the service and maintenance of the turbines to the manufacturer or to a manufacturer approved subcontractor experienced in such service.
- During both construction and operation of the wind turbines, all solid and liquid wastes shall be removed from the site in accordance with all applicable regulations.
- During construction, heavy equipment will be used that utilizes lubricants, fuel, coolant antifreeze and other potentially hazardous materials. Best Management Practices (BMPs)

will be implemented to assure there is no release or spills of any such materials on the project site.

- The College commits to following turbine manufacturers recommended procedures in performing any routine maintenance or repairs that involve handling or disposal of such lubricants or coolants.

Copies of the Final EA are available at the DOE Golden Field Office Public Reading Room website at http://www.eere.energy.gov/golden/Reading_Room.aspx. or from:

Steve Blazek
NEPA Compliance Officer
DOE Golden Field Office
1617 Cole Blvd.
Golden, CO 80401-3393
Steve.Blazek@go.doe.gov

For further information on the DOE NEPA process contact:

Office of NEPA Policy and Assistance
U. S. Department of Energy
1000 Independence Avenue. S.W.
Washington, DC 20585
(202) 586-4600 or 1-800-472-2756

Issued in Golden, Colorado this 17th day of December, 2009.

Rita L. Wells
Executive Director for Field Operations

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List of Abbreviations

AGL	Above Ground Level
BMPs	Best Management Practices
BVW	Bordering Vegetated Wetland
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB	decibel
dBA	A-Weighted decibel
DOE	Department of Energy
DOT	Department of Transportation
EA	Environmental Assessment
EMF	Electro Magnetic Field
EMI	Electro Magnetic Interference
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GCC	Gardner Conservation Commission
EPA	Environmental Protection Agency
Ldn	day-night average sound level
MADFW	Massachusetts Division of Fisheries and Wildlife
mG	Milligauss, a unit of measurement of magnetic fields
MEPA	Massachusetts Environmental Policy Act
MHC	Massachusetts Historical Commission
MRPC	Montachusett Regional Planning Commission
MW	Megawatt(s)
MWCC	Mount Wachusett Community College
NEPA	National Environmental Policy Act
NHESP	Massachusetts Natural Heritage and Endangered Species Program
OOC	Order of Conditions
ORW	Outstanding Resource Water
SCADA	Supervisory Control and Data Acquisition
PGP	Corps of Engineers Programmatic General Permit
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

CHAPTER 1 INTRODUCTION

1.1 National Environmental Policy Act/Massachusetts Environmental Policy Act

National Environmental Policy Act (NEPA)

The U.S. Department of Energy (DOE), in compliance with the National Environmental Policy Act (NEPA) of 1969, has prepared this Environmental Assessment (EA) for the proposed Mount Wachusett Community College (MWCC or College) Wind Energy Project in Gardner, Massachusetts. The College proposes to build one to two megawatt scale wind turbines on the college campus to provide electricity for the college.

Conditional upon the completion of the Final EA and issuance of a Finding of No Significant Impact (FONSI), DOE proposes to provide Congressionally Directed Federal funding to the College for a portion of the cost of construction of the wind turbines (Project/Proposed Action). The proposal to use federal funds is considered a major federal action and is subject to NEPA.

Pursuant to the requirements of NEPA, the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021), DOE has prepared the EA to:

- Identify environmental effects of implementing the proposed action (construction of one to two wind turbines);
- Evaluate viable alternatives to the proposed action, including a no action alternative;
- Describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- Characterize any irreversible and irretrievable commitments of resources that would be involved should this proposed action be implemented.

The Draft EA was made available to interested members of the public and to federal, state, and local agencies for review and comment prior to DOE's final decision on the Proposed Action.

Massachusetts Environmental Policy Act (MEPA)

The Massachusetts Environmental Policy Act (MEPA) requires that state agencies study the environmental consequences of their actions, including permitting and financial assistance. It also requires them to take all feasible measures to avoid, minimize, and mitigate damage to the environment.

A project requires environmental review under MEPA when there is an action of an agency of the Commonwealth (i.e. as the proponent, funding source, or permit issuing agency) *and* when the magnitude of a project exceeds a review threshold. The College is a state agency and therefore there is a state agency action. However, the project does not meet or exceed any of the MEPA review thresholds.

A request was submitted to the State for a determination as to whether review would be required for the project. In a letter dated December 1, 2008, the Assistant Secretary of the Executive Office of Energy and Environmental Affairs determined that the project is not subject to review under MEPA. A copy of this letter is provided in Chapter 8.

1.2 Purpose and Need

By providing financial assistance to support the project, DOE would carry out its mission to support national energy needs and the development of alternative energy sources.

The College is proposing the project to offset power purchases and to support its renewable energy curriculum. The College is an accredited public two-year institution serving 29 cities and towns in North Central Massachusetts. The main campus is located on a 300-acre state-owned site in the City of Gardner, Worcester County, Massachusetts. The College is a recognized leader in the use of clean energy technology. The College has installed a biomass fired heating system, a biomass gasification and cogeneration system, and a photovoltaic array on the roof of the main building. The Project will also support the College's goal to train a regional work force to meet the needs of the renewable energy industry through its renewable energy curriculum.

1.3 Scoping and Public/Agency Participation

The general public and all interested state, local, and federal agencies were invited to comment on the scope of the EA as part of the NEPA process. The DOE mailed Notice of Scoping postcards on December 18, 2008 directing them to DOE's public reading room website (http://www.eere.energy.gov/golden/Reading_Room.aspx). The scoping letter described the Project as well as other technical reports. Recipients were asked to identify potential issues that should be evaluated in the EA. The scoping letter and distribution list of recipients are included in Chapter 8.

Comments received from agencies during the scoping process for the EA are included in Chapter 8. One private citizen submitted a comment supporting the project. Formal DOE coordination with the U.S. Fish and Wildlife Service (USFWS) and the Massachusetts Historical Commission (MHC), State Historic Preservation Officer (SHPO) pursuant to Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act respectively has been completed as

part of the NEPA process. There are two federally recognized Indian tribes in Massachusetts, the Wampanoag Tribe of Gay Head (Aquinnah) and the Mashpee Wampanoag Tribe. These tribes are located in the southeastern part of Massachusetts, which does not include the project area. Section 106 coordination with the Tribal Historic Preservation Officer is not required for this project.

As part of the Feasibility Study prepared in August 2008 for the project, early coordination letters were sent to the USFWS, Massachusetts Natural Heritage and Endangered Species Program (NHESP), and the MHC. The response letters are included in Chapter 8.

As part of the community outreach for the project, the College presented the project on a local radio program, a local access TV station, and hosted a public open house information meeting in July 2009. Approximately 150 abutters to the College campus received a letter about the open house and the availability of the Draft EA.

DOE sent notices announcing the availability of the Draft EA for public comment to the same federal, state, and local agencies, representatives, businesses, and individuals that received the scoping notice. The Draft EA was also made available for public review and comment on the DOE Golden Field Office reading room website and the College website. No comments on the Draft EA were received.

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

2.1.1 Project Description

The College proposes to install and operate one to two grid-connected megawatt scale wind turbine electric generators on its main campus to offset power purchases. The proposed location for the wind turbines is at the main campus at 444 Green Street in the City of Gardner, Worcester County, Massachusetts, as shown on Figure 1, USGS Project Locus, Figure 2, Project Site Aerial Photo and Figure 3, Site Base Plan. The existing 50 meter meteorological test tower is currently located at the site. The met tower will be removed prior to the erection of the wind turbines. Similar to the way it was erected, this guyed tower could be removed without any heavy equipment using a winch mounted on a small stationary truck supplemented by hand labor on the guy wires for stabilization. Alternatively it may be removed as part of the crane work during turbine construction. The determination of the timing and specific methods of removing the met tower will be made with the general contractor selected for the construction phase of the project.

Two turbines are proposed as shown on the figures. The base for the turbines would be deep foundations or spread foundations. The type and size of the foundations will be determined by the project structural engineer based on the results of the geotechnical investigation. The structural engineer for the project has not yet been determined or hired so specific details of the foundations have yet to be determined.

Depending on bearing capacity of soils, depth and quality of bedrock, and other geotechnical and cost considerations, a wide variety of foundation design strategies can be utilized. Some turbine foundations are large, shallow, square, round or octagonal spread footing or gravity foundations up to sixty-five feet in diameter that rely on concrete and soil overburden to provide sufficient weight to resist overturning. Short pier foundations rely on sidewall friction and lateral earth bearing pressures to resist the lateral loads on the tower. Pile and cap foundations and rock anchor and cap foundations can utilize deep pilings or the bedrock itself to resist the loads on the towers and thus be much smaller in diameter. And there are hybrid solutions, some of which have been patented.

Foundations could potentially range from approximately 16 feet in diameter and up to 45 feet in depth to as much as 65 feet in diameter and only 4 to 6 feet in depth. The report of the geotechnical engineer for the project suggests utilizing “a shallow foundation support system consisting of a reinforced concrete mat foundation to support the monopole”. The structural engineer will determine the design of the foundation in the design phase of the project.

Land disturbance during construction would be approximately 1 acre within the 3 to 5 acre project area, and would include the equipment laydown area. A gravel service road would be constructed from the nearby campus access road to Matthews Street to allow for construction and maintenance. Topsoil would be removed and stockpiled. The road would be constructed with dense graded crushed stone with a top base course of gravel base. During construction the portion of the road between the two turbines will be 36 feet wide to allow access and maneuvering for the large crane necessary for installing the turbine. After construction the finished width of the gravel road will be 14 feet throughout as shown on Figure 3, Site Base Plan C-1A. The width of the temporary road will be restored to natural vegetation. The road crosses an isolated vegetated wetland area. Approximately 2,500 SF of the isolated wetland in the northwestern portion of the field will be unavoidably altered to construct the access road, as shown on Figure 3 Site Base Plan C-1A. Wetland replication of 2,600 SF is proposed adjacent to the areas and is an applicant committed measure.

The existing parking lot across from the site would be used as a staging area. During construction a temporary gravel crane pad area of approximately 45 feet by 100 feet would be constructed at each turbine site. After construction, the crane pad areas would be restored and reseeded with native grasses. Approximately 8 -12 mature white pine trees along the existing campus road would need to be cut for the access road.

The specific turbine model has not been identified but would be between 900 kilowatts (kW) and 2.0 megawatts (MW) each. The project feasibility study specifically analyzed the Vestas V-82 turbine and the GE 1.5 turbines. Other manufactures being considered include Suzulon, AAER, Furlander, DeWind, EWT Emergya, Nordex, Gamesa, Nordic Windpower, Samsung and others.

The types of wind turbines being considered turn at a maximum rate of approximately 32 revolutions per minute. The proposed turbines would be installed on steel monopole towers with a total height to the top of the blade arc a maximum of 415 feet above ground level (AGL). It is expected that the towers will be 65 to 80 meter towers that come in sections suitable for road transport and are assembled on site. The rotor diameters would be between 54 meters (Emergya 900) and 90 meters (Gamesa G-90). Final height and blade diameter determination and manufacturer decisions will be made through an evaluation of optimized turbine power output and cost/availability.

Power transmission from the turbine site to the interconnection at the main meter room for the campus would be through underground cable. Installation of the cable would consist of trenching from the field, across the two-lane campus access road and across the front lawn areas. A transformer would be installed near the base of the northern wind turbine

A pad-mounted transformer and primary switch would be located adjacent to each wind turbine. Underground 600 volt power lines would be installed from each wind turbine to the pad-mounted transformer and switch. An underground power line approximately 720 feet in length, following the proposed roadway, would interconnect the two transformers and switches and would carry 13,800 volt power lines, plus communications and control wiring. This underground power line would continue approximately another 700 feet to the main college building's substation room, where the lines would interconnect with the main campus primary switchboard.

Typical 600 volt trenches would be approximately 48 inches deep by 24 inches wide. Typical 13,800 volt trenches would be approximately 48 inches deep by 36 inches wide.

All underground transmission systems would be installed using conventional installation and trenching techniques. Approximately 1540 feet of communications/control wiring and cables would be installed in the same trench. No aboveground power lines or cables would be constructed or installed. The ducts would have a minimum of 30 inches of compacted backfill, consisting of the material which was excavated.

The underground power lines would be encased in a concrete envelope where they pass under roadways and parking areas, and where they must cross the wetland. In areas where the underground ducts are installed beneath unpaved areas, the ducts would be set in a bed of sand.

At intervals of approximately 300 feet, hand holes or pull boxes, approximately 70 inches long by 50 inches wide, would be provided to facilitate pulling the cables. H20 class prefabricated hand holes would be used in areas not subject to traffic. Heavy duty pre-cast concrete hand holes would be used in roadway and parking lot areas.

The turbines would be within the airspace for the Gardner Airport. During the preparation of the Feasibility Study for the project, the Federal Aviation Administration (FAA) was asked to review the project. FAA issued a Determination of No Hazard to Air Navigation for the 415-foot maximum height. Based on subsequent survey and evaluations completed during the preparation of the EA, the proposed location for the turbines has been shifted approximately 100 feet east. This location is approximately 8 feet higher elevation. As part of the ongoing preliminary design effort, the revised location was submitted to FAA in September to update the Determination. The structures will be lighted in accordance with the FAA Advisory Circular on Obstruction Marking and Lighting. The FAA 2008 Determinations for the two towers are provided in Appendix 1.

2.1.2 Permits and Approvals

The permits, reviews and approvals required for the proposed project along with the status of the permits are provided in Table 2-1. Local permits, such as building permits, are not required because the College is a state entity and is not subject to local regulations. State level building permit review is required by the Commonwealth of Massachusetts Board of Building Regulations and Standards.

Wetland permitting under the Massachusetts Wetlands Protection Act and Section 401 of the federal Clean Water Act is administered by the Gardner Conservation Commission (GCC). The GCC issued an Order of Conditions for the project in November 2009 (provided in Appendix 6.3). Wetland replication of 2,600 SF is proposed and is an applicant committed measure. Section 404 of the Clean Water Act is administered by the U.S. Army Corps of Engineers. The project would qualify as a non-reporting Category 1 permit under the Programmatic General Permit (PGP) for Massachusetts because there will be less than 5,000 SF of wetland fill and the project will comply with all General Conditions of PGP. The project does not require an individual 401 Water Quality Certification application because there will be less than 5,000 SF of Isolated Vegetated Wetlands fill.

Table 2-1_ Permits and Approvals

Agency	Permit/Approval	Status
Federal Aviation Administration	Aeronautical Determination	Completed. Will be updated during preliminary design.
	Form 7460-2, Notice of Actual Construction or Alteration	To be submitted 10 days prior to construction.
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Massachusetts Aeronautics Commission	Request for Airspace Review	Application has been submitted.
Massachusetts Board of Building Regulations and Standards	State building permit	Application to be submitted during final design.
MA Department of Environmental Protection	Section 401 Water Quality Certification.	Individual Application not required. Activity certified through the Section 404 PGP.
Gardner Conservation Commission (MA Wetlands Protection Act)	Determination of Applicability	Completed. Wetland Boundaries Approved
	Order of Conditions	Completed. Order of Conditions issued November 23, 2009

2.1.3 Applicant Committed Measures

The College is committed to the following design, construction, and operational measures to minimize or avoid environmental impacts.

Avian Resources

- Electrical supply lines will be installed underground.
- Ground lighting of the turbine site will be limited to the turbine base (not the road) and full cut off fixtures will be specified to reduce potential for attraction of night migrating songbirds and other species. The lights will only be turned on at night as required for emergency maintenance or security patrols.

- FAA Advisory Circular AC70/7460-1K provides the standards for marking and lighting structures to promote aviation safety and the College will commit to following these standards:
    - Monopoles will be painted bright white.
    - The lighting for each turbine will include either a red flashing beacon (L-864) or a white strobe light (L-865) with the longest permissible off cycle (20 to 40 flashes per Minute (FPM).
    - The lights would be placed as high as possible on the turbine nacelle, so as to be visible from 360 degrees.
    - Steady burning red FAA lights will not be used.

- The College will develop a campus-wide grounds management plan. This plan will evaluate and incorporate measures to enhance habitat for Bobolink and other grassland birds, and Yellow Watch List species such as Willow Flycatcher either at the project site or other appropriate areas on the campus.

- A mortality survey for birds will be conducted for one full operating year with a contingency for a 2nd year. The survey will be developed and conducted under the technical guidance of the TAC. The survey report will be submitted to the TAC, which will include federal and state agency members.

- A Technical Advisory Committee (TAC) will be formed and headed by the College to ensure that all additional study protocols meet the recommendations of the Massachusetts Division of Fisheries and Wildlife (MADFW), USFWS, and other interested parties. The TAC will coordinate with interested parties to design post-construction mortality and acoustic study protocols. The minutes of the TAC meetings will be posted on the College's website. The TAC will also evaluate adaptive management techniques. The College will implement Adaptive Management procedures as part of their Operational Plan if the post construction studies identify significant levels of avian mortality.

Bat Resources

- The College conducted a supplemental spring migration acoustic study for bats between March 15 and June 15, 2009. The report is included in Appendix 3. Summer and fall acoustic studies for bats have been completed.

- A mortality survey for bats will be conducted for one full operating year with a contingency for a 2nd year. The survey will be developed and conducted under the technical guidance of biologists experienced with fatality studies at wind turbine facilities.

- The College will implement Adaptive Management procedures if the post construction studies identify significant levels of bat mortality. For example, if it is found that the turbines are significantly impacting local bat populations, shutting down the turbines at low wind speed might reduce bat mortality to acceptable levels. The management options will have the goal to reduce mortality risk while minimally impacting project viability.

Wetland Resources

- Final width of permanent access road will be 14 feet. After construction, the temporary crane pads, and temporary width of road will be restored to grass using a native seed mix or wetland using stockpiled wetland soils. Trees will be replanted elsewhere on the site to replace the trees cut along the campus drive.

- The Contractor will prepare an erosion control plan to protect wetland and grassland resources, as well as downstream drinking water supply, Crystal Lake.

- The College will comply with all conditions in the Order of Conditions issued by the Gardner Conservation Commission and will comply with all terms and Conditions for a Category 1, Non Reporting of the Department of the Army Programmatic General Permit for Massachusetts.

- The College will construct 2,600 SF of wetland replication as shown on the site base plan, Drawing C-1A.

Health and Safety

- The Contractor will prepare a construction phase Health and Safety Plan for worker safety that complies with all state and federal standards.

- The College will develop an Operational Plan for the wind turbines that will include adaptive management for ice throw and shadow flicker. Ice throw can

be managed either through automated control systems in the turbines which shut the turbines down when the Supervisory Control And Data Acquisition (SCADA) system senses blade weight imbalances due to icing and/or through a variety of ice prevention and ice melting technologies that can be applied to the blades. Decisions on specific ice throw mitigation strategies will be dependent on the turbine vendor selected. Having adequate solutions for ice through mitigation will be one criteria used in selection of the turbine manufacturer for the project.

Turbine Flicker

- If the College receives complaints from residential property owners regarding the shadow flicker, the College is committed to programming the automated control system to shut down the turbines at the easily determined times such impact may occur.

Additional Mitigation

- The College will obtain and adhere to all necessary permits as listed in Table 2.1.
- The College would contract the service and maintenance of the turbines to the manufacturer or to a manufacturer approved subcontractor experienced in such service.
- During both construction and operation of the wind turbines, all solid and liquid wastes shall be removed from the site in accordance with all applicable regulations.
- During construction, heavy equipment will be used that utilizes lubricants, fuel, coolant antifreeze and other potentially hazardous materials. Best Management Practices (BMPs) will be implemented to assure there is no release or spills of any such materials on the project site.
- The College commits to following turbine manufacturers recommended procedures in performing any routine maintenance or repairs that involve handling or disposal of such lubricants or coolants.

2.2 No Action Alternative

The No Action alternative is considered in the EA to provide a comparison of environmental effects of the Proposed Action. Under the No Action alternative, DOE would not provide funding.

While it is possible that the College could seek other funding sources, that scenario would be identical to the Proposed Action and would not provide a meaningful comparison of potential impacts. For purposes of this EA, the No Action alternative is evaluated as if the wind project is not built.

2.3 Alternative Sites Considered But Eliminated From Detailed Analysis

Two other areas of the campus, a shorter turbine height, and an alternative alignment for the access road were considered by the College for the proposed project:

- An area adjacent to the salt shed towards the rear of the main campus, near the undeveloped portion of the property
- A wooded area of higher elevation at the northeasterly limit of the College property
- A shorter turbine (315 feet maximum)
- A shorter, more direct, access road that would impact a Bordering Vegetated Wetland (BVW) that is classified as an Outstanding Resource Water (ORW)

The alternative sites were considered in terms of open exposure to prevailing winds, access, economic feasibility, obstructions for constructability, proximity to the primary electric load center for the College, distance from residential areas, and aviation airspace.

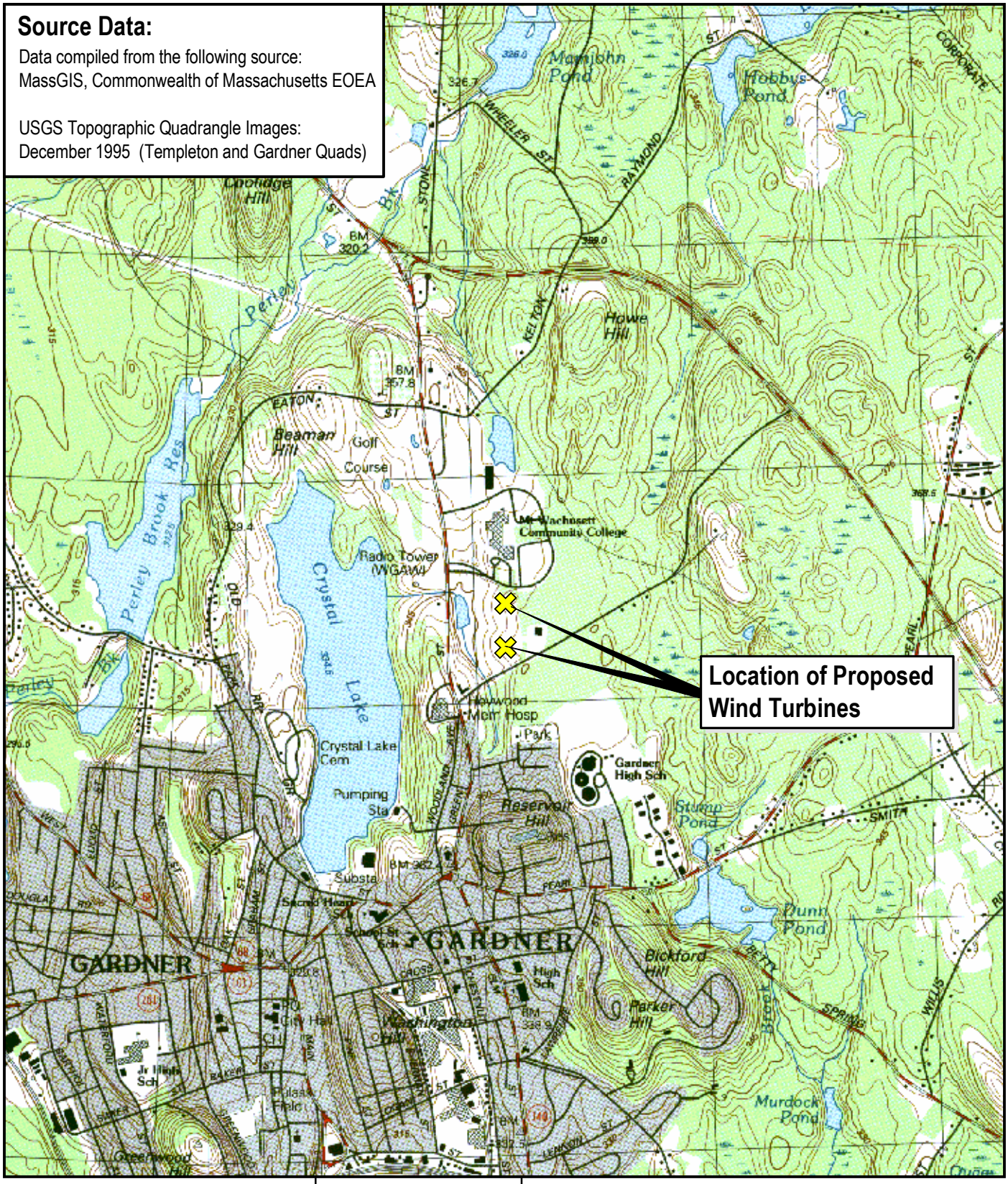
The salt shed area would require additional land clearing to obtain construction access and staging. The electric load center for the College is on the opposite side of the main building. Cost of construction would be higher and would affect the economic feasibility of the project.

The wooded area of higher elevation was considered in order to optimize use of the wind resource. However, significant clearing of the forest would be required to construct a long access road to the site and to clear obstructions for construction. This would further fragment the woodland in the area and would require longer roads and other infrastructure for site development. The electric load center for the College would be a significant distance. Cost of construction would be significantly higher, would not be offset by a comparable increase in wind energy, and would affect the economic feasibility of the project. Additionally, the site is closer to residential areas.

A shorter turbine at the site of the Proposed Action was considered during preparation of the Feasibility Study. The analysis determined that a shorter turbine would not be economically feasible.

A shorter service road that would align directly with the two turbines was considered. However, this alignment would cross a narrow section of BVW that has been classified an ORW because it is tributary to a public water supply (Crystal Lake shown on Figure 1).

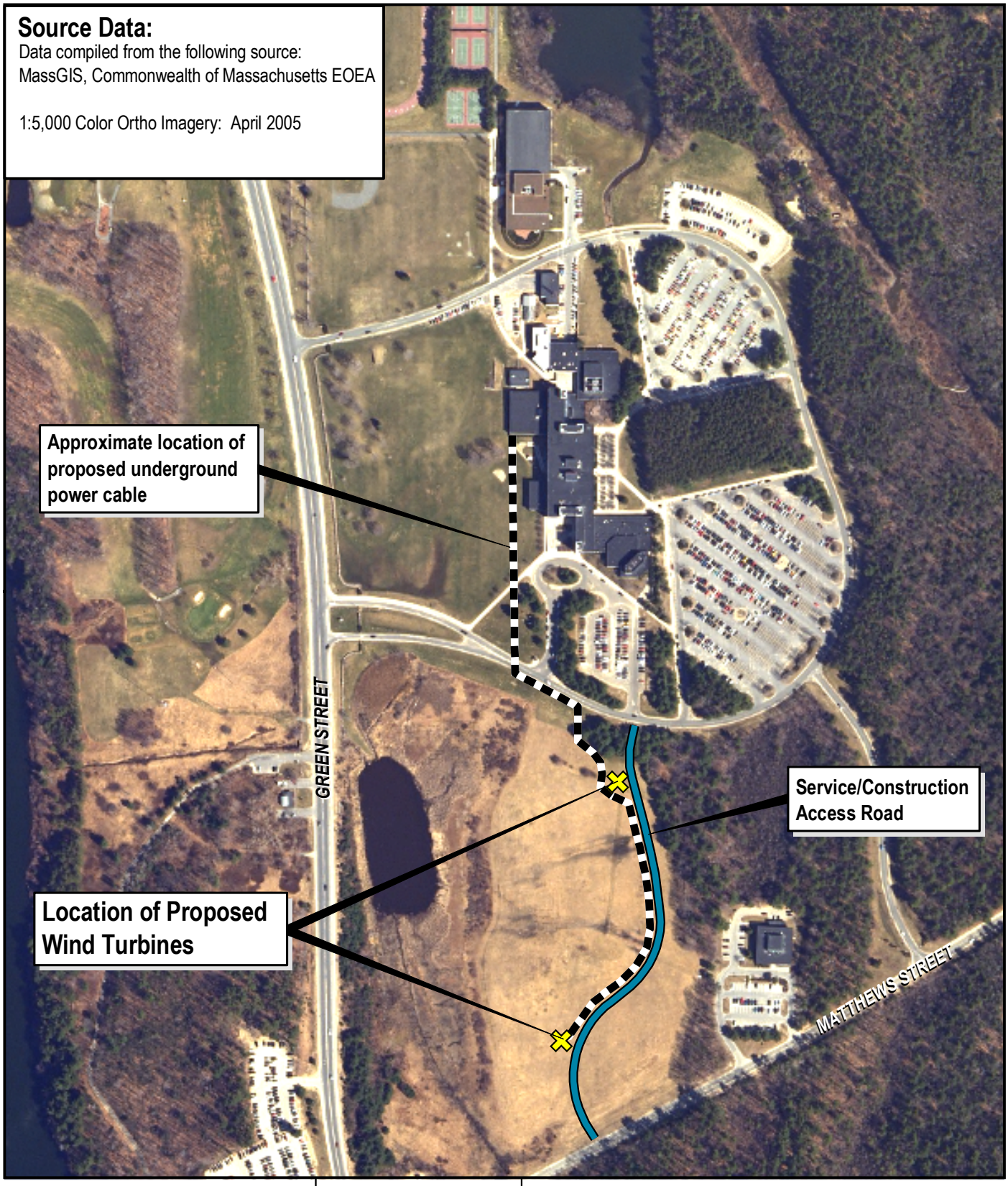
These alternatives were determined by the College to be not feasible when compared to the proposed action and were eliminated from further consideration and study in this EA.

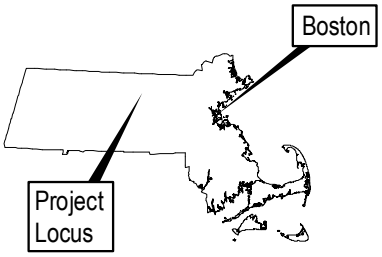


Locus Map

Mount Wachusett Community College
Wind Turbine Project
Gardner, MA

Figure 1



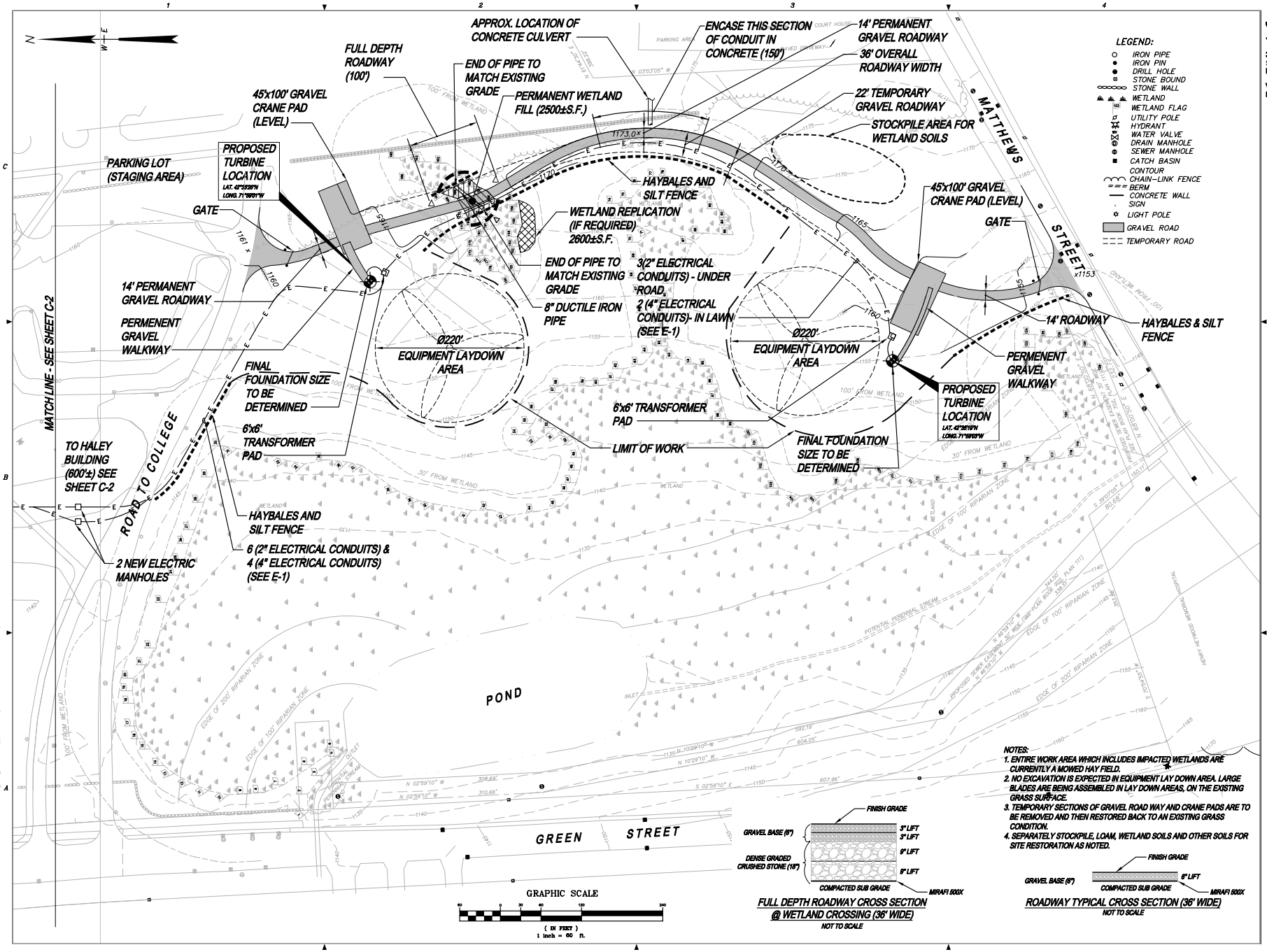


Approx. Scale: 1"=400'

Project Site Map

Mount Wachusett Community College
Wind Turbine Project
Gardner, MA

Figure 2



FULL DEPTH ROADWAY CROSS SECTION @ WETLAND CROSSING (36' WIDE)

NOT TO SCALE

NOTES:

1. ENTIRE WORK AREA WHICH INCLUDES IMPACTED WETLANDS ARE CURRENTLY A MOWED HAY FIELD.
2. NO EXCAVATION IS EXPECTED IN EQUIPMENT LAY DOWN AREA. LARGE BLADES ARE BEING ASSEMBLED IN LAY DOWN AREAS, ON THE EXISTING GRASS SURFACE.
3. TEMPORARY SECTIONS OF GRAVEL ROAD WAY AND CRANE PADS ARE TO BE REMOVED AND THEN RESTORED BACK TO AN EXISTING GRASS CONDITION.
4. SEPARATELY STOCKPILE, LOAM, WETLAND SOILS AND OTHER SOILS FOR SITE RESTORATION AS NOTED.

ROADWAY TYPICAL CROSS SECTION (36' WIDE)

NOT TO SCALE

JACOBS
Jacobs Engineering Group, Inc.
343 Congress Street
Suite 2100
Boston, MA 02210
V: 617.242.9222
F: 617.242.9824

CONSULTANTS

Revision:

Date:	By:	Description:
1 11-11-09	RAT	WETLAND REVISIONS
2 11-20-09	RAT	STOCKPILE AREA

CLIENT AND(OR) PROJECT INFO.

WIND TURBINE PROJECT
MT. WACHUSETT COMMUNITY COLLEGE
GARDNER, MA

Key Plan:

Scale: 1"=60'

Jacobs Project No.: F5W95700

Drawing Title:

SITE BASE PLAN

Date: SEPTEMBER 14, 2009

Designed By: RAT
Drawn By: GPN
Checked By: WTG

Drawing No.: C-1A

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Environmental Categories Evaluated and Dismissed From Further Analysis

USDOE NEPA guidance documents were used to identify environmental categories within the affected environment and evaluate the potential for impacts from the proposed action. Elements of the affected environment are discussed in detail. Some environmental categories are not present at the project site or are not likely to have impacts associated with the proposed action as discussed below and summarized in Table 3-1.

- ✓ Air Quality

Other than temporary construction-related fugitive dust emissions, Air Quality will not be affected by the project because it will not result in adverse air emissions and auto traffic within the area will not increase. Additionally, the energy project will have an overall positive impact on air quality since two turbines of this size are expected to reduce power plant emissions (primarily CO_2) by approximately 5 million pounds per year. Therefore, adverse impacts are not expected and Air Quality is dismissed as an impact category for analysis.

- ✓ Coastal Resources

The project is in central Massachusetts and is not near any coastal resources. Therefore, impacts are not expected and Coastal Resources is dismissed as an impact category for analysis.

- ✓ Parkland [Section 4(f)]

The project will not result in the direct (physical) or indirect (impairment) use of a publicly owned park, recreation area, wildlife or waterfowl refuge, or land of a historic site. Therefore, impacts are not expected and Section 4(f) Resources is dismissed as an impact category for analysis.

- ✓ Farmland

The project would not affect agricultural lands or prime or unique farmland soils as defined by the Natural Resource Conservation Service. Therefore, impacts are not expected and Farmland is dismissed as an impact category for analysis.

- ✓ Floodplain

The FEMA floodplain map for the area was checked. The project is not within the 100 or 500-year floodplain. Therefore, impacts are not expected and Floodplain is dismissed as an impact category for analysis.

- ✓ Hazardous Materials

The MassGIS database was reviewed for hazardous materials issues. No potential solid waste sites were identified. The Massachusetts Department of Environmental Protection (DEP) Waste Site Reportable Release Look Up website was reviewed. There are records of a reportable oil release and chemical release at the College from 1997. The proper clean-up procedure was followed and the sites are considered closed. These releases were not near the field site. The proposed site has historically been a mowed field and there is no known history of hazardous materials released in the area. Therefore, impacts are not expected and Hazardous Materials is dismissed as an impact category for analysis.

During construction, heavy equipment will be used that utilizes lubricants, fuel, coolant antifreeze and other potentially hazardous materials. Best Management Practices (BMPs) will be implemented to assure there is no release or spills of any such materials on the project site.

During operation, wind turbines also require lubricants and coolants, some of which might be considered Hazardous Materials if released into the environment. The College commits to following turbine manufacturers recommended procedures in performing any routine maintenance or repairs that involve handling or disposal of such lubricants or coolants. The College would contract the service and maintenance of the turbines to the manufacturer or to a manufacturer approved subcontractor experienced in such service. Most service happens without cranes or additional equipment with service personnel climbing the ladder inside the turbine tower and hoisting necessary equipment or materials inside the tower.

During both construction and operation of the wind turbines, all solid and liquid wastes shall be removed from the site in accordance with all applicable regulations.

- ✓ Historical, Archaeological, and Cultural Resources

Consultation was carried out with the Massachusetts Historical Commission (MHC) during preparation of the Feasibility Study. MHC determined *"that this project is unlikely to affect significant historic or archaeological resources"*. Formal DOE coordination with MHC pursuant to Section 106 of the National Historic Preservation Act has been initiated. Based on the 2008 Determination by MHC, impacts are not expected and Historical, Archaeological, and Cultural Resources is dismissed as an impact category for analysis. Concurrence from MHC is provided in Chapter 8.

- ✓ Natural Resources and Energy Supply

The project would not cause an increase in demand that would exceed available natural resources such as building materials, or energy supplies. The project would have a long-term beneficial impact to energy supply because wind energy is a renewable resource. Therefore, impacts are not expected and Natural Resources and Energy Supply is dismissed as an impact category for analysis.

- ✓ Secondary Impacts

The project will serve existing electric demand at the College and will not induce other development. Therefore, impacts are not expected and Secondary Impacts is dismissed as an impact category for analysis.

- ✓ Socioeconomic Impacts / Environmental Justice

The area is not mapped as an Environmental Justice area on the MassGIS database. The project will not change local or regional land use. Therefore, impacts are not expected and Socioeconomic Impacts / Environmental Justice are dismissed as an impact category for analysis.

- ✓ Water Quality

Crystal Lake is west of the College campus as shown on Figure 1. Crystal Lake is a surface water supply for the City of Gardner. Water is pumped to the lake from Cowee Pond and Perley Brook Reservoir and treated at the Crystal Lake Water Treatment Facility. The wetland system on the campus is upstream of the Lake and the intermittent stream ultimately flows to the Lake. The project will not modify any stream or other body of water. There will be an unavoidable minor wetland crossing for the gravel access road at the upper reaches of the wetland. This is discussed below in Section 3.4. The erosion control measures presented in Section 2.1.3 will be in place to protect the wetlands and water quality. Therefore, impacts to Crystal Lake are not expected and Water Quality is dismissed as an impact category for analysis.

- ✓ Wild and Scenic Rivers

The National Park Service and MassGIS databases have been checked. There are no national or state Wild and Scenic Rivers within the project area. Therefore, impacts are not expected and Wild and Scenic Rivers is dismissed as an impact category for analysis.

- ✓ Transportation

The project will not result in an increase in vehicular traffic or require a change in traffic circulation. No new roads are required except for the gravel service access

road. Therefore, impacts are not expected and Transportation is dismissed as an impact category for analysis.

- ✓ Intentional Destructive Acts

In December 2006, the DOE Office of General Counsel issued interim guidance stipulating that NEPA documents completed for DOE actions and projects should explicitly consider intentional destructive acts (i.e., acts of sabotage or terrorism). Construction and operation of the wind turbines would not involve the transportation, storage, or use of radioactive, explosive, or toxic materials. Consequently, it is highly unlikely that construction or operation of the turbines would be viewed as a potential target by saboteurs or terrorists. The project location is not near any national defense infrastructure or in the immediate vicinity of a major inland port, container terminal, freight trains, or nuclear power plants. The Proposed Action would not offer any targets of opportunity for terrorists or saboteurs to inflict adverse impacts to human life, health, or safety.

In summary, this EA evaluates the impacts of the No Action and the Proposed Action alternatives under the following impact topics:

- Avian Resources
- Bat Resources
- Wetland Resources
- Land Use
- Aviation Resources
- Electro Magnetic Interference
- Visual Resources (and Shadow Flicker)
- Noise
- Health and Safety

Table 3-1_ Environmental Categories Evaluated

Impact Categories	Determination
Air Quality	No Adverse Impacts Expected. Dismissed from Further Analysis.
Coastal Resources (Coastal Dune)	Not Present. Dismissed from Further Analysis.
Department of Transportation Act: Sec. 4(f)	Not Present. Dismissed from Further Analysis.
Farmlands	Not Present. Dismissed from Further Analysis.
Wildlife—Avian	Addressed in EA.
Wildlife--Bats	Addressed in EA.
Wetlands	Addressed in EA.
Rare and Endangered Species	Addressed in EA.
Land Use	Addressed in EA.
Floodplains	Not Present. Dismissed from Further Analysis.
Hazardous Materials, Pollution Prevention, and Solid Waste	No Impacts Expected. Dismissed from Further Analysis
Historical, Architectural, Archaeological, and Cultural Resources	No Impacts Expected. Dismissed from Further Analysis
Aviation	Addressed in EA.
Electro Magnetic Interference	Addressed in EA.
Light Emissions or Visual Impacts (including flicker effect)	Addressed in EA.
Natural Resources and Energy Supply	No Impacts Expected. Dismissed from Further Analysis
Noise	Addressed in EA.
Secondary (Induced) Impacts	No Impacts Expected. Dismissed from Further Analysis
Socioeconomic Impacts / Environmental Justice	No Impacts Expected. Dismissed from Further Analysis
Water Quality	No Impacts Expected. Dismissed from Further Analysis
Wild and Scenic Rivers	Not Present. Dismissed from Further Analysis
Transportation	No Impacts Expected. Dismissed from Further Analysis
Health and Safety	Addressed in EA.
Source: DOE NEPA Guidance Document and Consultant Evaluation	

3.2 Avian Resources

3.2.1 Affected Environment

Introduction

The project site is located in a 13 acre isolated field approximately 600 feet south of the main building on the College campus. Habitat surrounding the field includes a small pond and wetland, fragmented secondary woodland, and commercial development associated with the College campus, district court, hospital, golf course, and residential areas. Low, secondary oak-pine woodland and the District Court abut the site to the east. Matthews Road forms the site's southern boundary, across which taller, secondary oak-pine woodland occurs. To the west, the field descends to a pond with bordering vegetated wetlands and a wet meadow.

Information for this section was taken from the *Phase I Avian Risk Assessment* prepared for the project. Additional information can be found in the report, which is provided in Appendix 2. The existing avian resources at the site and within the general area are summarized below. Site visits, a literature search, a search of various databases, and a nesting bird census were utilized to understand avian resources within the project area.

Methodology

In July 2003, the USFWS Wind Turbine Siting Working Group issued voluntary *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (*Guidelines)* to the USFWS Regions and general public. These *Guidelines* would assist staff in providing technical assistance to the wind energy industry to avoid or minimize impacts to wildlife and their habitats through evaluation of potential development sites, design and location within such sites, and pre-and post-construction impact studies. Recommendations were included on site development and turbine design and operation. The *Guidelines* were based on information available at the time. Industry use of and feedback on the *Guidelines* was encouraged. In April 2004, the USFWS issued a supplemental memo on Implementation of the Guidelines.

The methodology developed for site selection, pre-construction data collection, site design, and post-construction monitoring for the Proposed Project has been based on the scale of the project and specific local conditions, using the *Guidelines* and project comment letter as a guide.

In March 2008 the New England Field Office of USFWS sent an early coordination comment letter to the College regarding the Proposed Project that included a recommendation for 3 years of pre-construction radar studies. The use of radar studies for three years as part of the pre-construction assessment protocol for the Project was evaluated. The College determined that radar studies were not warranted

for the Project based on the assessment of several factors. The nocturnal migration pattern (traffic, altitude, percent of birds flying at rotor height, etc.) has been well documented by radar studies at more than 20 sites in the northeast. There is no data to indicate that migration patterns would be substantially different at the Project site. Additionally, post-construction mortality studies at wind energy facilities have established that average fatalities are relatively low. Based on the literature and site-specific evaluations, the Project appears to be a wind power facility with very low risk of avian impacts. In summary, the high financial cost of pre-construction radar studies cannot be justified for a project with only one or two turbines situated in an area without significant avian nesting, foraging, migrating, or wintering habitat.

Federal and State-Listed Species

No federal or state-listed species were observed at the site during the April and June 2008 site investigations. Early consultations were carried out with state and federal agencies regarding threatened and endangered species. The USFWS determined in a letter dated March 5, 2008 that no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the USFWS are known to occur in the project area. The Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (NHESP) determined in a letter dated March 3, 2008 that the site is not mapped as Priority or Estimated Habitat and the database does not contain any state-listed species records in the immediate vicinity of the site.

The Sharp-shinned Hawk, a Massachusetts species of special concern, has been recorded in the County.

Breeding Birds

A nesting bird census was conducted at the site during June of 2008. In total, 43 species were recorded at and immediately adjacent to the project site. About half of the species nest within the field, the forested edge adjacent to the field, or within the wetlands adjacent to the pond. The species observed were mostly songbirds of upland fields and forest edges. Both male and female Bobolinks were observed, suggesting that Bobolinks nest at the site. This species was the only obligate grassland bird nesting in the field. The Willow Flycatcher has established a small breeding population in the shrub zone bordering the pond. The Willow Flycatcher is listed on the *Yellow Watchlist*, which includes the highest priority birds for conservation.

Migratory Birds

Migratory bird groups are discussed separately as nocturnal songbirds, raptors, and waterbirds.

Nocturnal Migrating Songbirds

Night-migrating songbirds are the most numerous birds migrating over Massachusetts. In Massachusetts, songbird migration is concentrated from mid-March to early June (spring migration) and from late August through mid-November (fall migration). Most night migration occurs along broad fronts rather than following topographic features such as coastlines, ridges and valleys. At times, migrating birds might change direction when there are significant topographic features such as very high mountains or might concentrate on the coastline.

Based on a review of the literature and evaluation of the project site, nocturnal songbird migration above the project site will be part of an extensive broad-front migration over central Massachusetts. The site is located away from the coast and other ecological barriers and magnets that could concentrate nocturnal migrants. The characteristics of migration traffic above the site will be low to moderate and most birds will fly will above the rotor-swept area.

Migrating Raptors

Based on a review of the on-line database maintained by the Hawk Migration Association of North America, Broad-winged Hawk is the most common migrant within about 10 miles of the project site. Broad-wing passage peaks in mid to late September. North-central Massachusetts lacks the long, linear ridges that would concentrate migrating hawks on updrafts. Hawks migrating over north-central Massachusetts rely mostly on rising columns of air, known as thermals. The migration pattern is broad front since thermal development is random by nature. The birds migrate at altitudes ranging from 600 up to 1,500 feet, well above the rotor-swept area.

Migrating Waterbirds

In the immediate project vicinity there are no large lakes, marshes, mudflats or other types of ecological magnets that would attract waterbirds, including geese, ducks, or other species in significant numbers. A small pond abuts the project site but would not attract more than small numbers of waterbirds during migration. Additionally, there are no agricultural fields at the site or nearby that would provide stopover habitat.

Wintering Birds

The Audubon Society's Christmas Bird Count (CBC) data are generally recognized as an excellent overview of the birds that inhabit an area or region during early winter. The data for the Westminster CBC (which overlaps the project site) were examined to understand the winter bird population likely to occur at the project site. The database indicates that the most common birds were waterbirds with Mallard Duck the most likely to occur in winter at the small pond adjacent to the project site.

The most land birds recorded included introduced species such as the starling and house sparrow as well as chickadee, junco, and other common birds. Eight species of raptors were recorded, with the red tail hawk the most abundant. The Sharp-shinned Hawk, a Massachusetts species of special concern, was recorded in the CBC.

A review of the CBC data and evaluation of the habitat at the project site, suggest that the site will have limited bird use in winter.

3.2.2 Environmental Consequences of Proposed Action

The impacts to avian resources resulting from the project were evaluated in terms of disturbance and displacement risk, and collision risk.

Disturbance and Displacement Impacts

Disturbance and displacement impacts may occur at the site as a result of construction, habitat modification and wind-turbine operation.

Some birds may be displaced temporarily during the construction period. Site preparation for the access road and turbine areas may displace birds. Such impact would have a greater effect during the breeding season. Site preparation is scheduled for the fall-winter season, which would reduce the potential for impacts.

There would be some modification to the field habitat and functional grassland for construction of the access road and turbine site. The project would not however fragment woodlands because the forests are already fragmented by the development within the area. Habitat modification and loss of some functional grassland may affect the small Bobolink population. The College is in the process of developing a campus-wide landscape management program that would include modification of the field mowing procedures for the benefit of grassland bird species, as outlined in Section 2.1.3. The management plan for the field will also evaluate the benefit of managing the field in favor of shrubland to provide habitat for species such as Willow Flycatcher.

Turbine operation could potentially displace breeding Bobolinks, but studies in the northeast indicate that these birds will nest near turbines. Impact during operation is therefore unlikely or insignificant.

In summary, disturbance and displacement effects resulting from the project are expected to be minor.

Collision Impacts

Collision risk varies with bird type. Nocturnal migrant songbirds, raptors, and waterbirds are discussed separately.

Nocturnal Migrating Songbirds

Collision risk factors for nocturnal migrating songbirds include tower height, guy wires, and lighting. The proposed wind turbines are low in height compared to tall communication towers (less than 500 feet), are on monopoles that do not have guy wires, and will have flashing FAA obstruction lights. Studies indicate that steady-burning lights are associated with more bird fatalities (Gehring, 2009). Songbirds are also at risk when the birds land in woodland or other habitats near the field to feed to replenish energy for their migration. The site for the proposed turbines would not concentrate migratory stopover because wooded habitat is not concentrated at the site but available at other nearby areas.

It is likely that collision mortality will be similar both in numbers and species composition of migrants to what has been recorded at other sites. As discussed in more detailed in the avian risk assessment report, the highest fatality rate reported is approximately 7-9 birds per turbine per year. Additionally, since fatalities at wind turbine sites are generally divided among many species, this would amount to one or two individuals of the most common species. This level of mortality is not likely to be biologically significant.

Raptors

Collision risk factors for raptors at wind turbine sites include design features, habitat features, and use of the area by raptors. Critical design features include number and spacing of turbines, lattice tower design, and fast rotating blades. Habitat features include prey base and nesting areas. Species most at risk would be those that nest or winter in the vicinity and become habituated to the wind turbines, as opposed to migrating raptors. The project poses low risk to raptors because there will be only one to two turbines on monopoles that would be widely spaced apart in a flat open field. The site evaluation identified the Red-tailed Hawk and Turkey vulture as the species likely to become habituated to the project. Migrating raptors are not expected to be impacted because migration in the area takes place across a broad geographic front at altitudes above the sweep of the rotors.

Waterbirds

Impacts to waterbirds are expected to be negligible because there are no significant wetland habitats that would attract or concentrate waterbirds at the site. The adjacent pond and wetland area are too small to attract significant numbers of waterbirds.

Summary of Avian Environmental Consequences

With the installation of only one to two turbines, the absolute numbers of fatalities would in all likelihood be very small and, when distributed among several avian species, would not be considered biologically significant. When compared with most other wind power facilities, collision risk factors for raptors will be minimal.

Collision risk to night-migrating songbirds is likely to be similar to other sites examined because the altitude of migration is generally above the sweep of the wind turbine rotors. In summary, collision effects resulting from the project would not expected to be biologically significant. Further, the Applicant Committed measures discussed in Section 2.1.3 will minimize avian impact. These measures include underground electrical supply lines, monopoles, flashing lights for FAA lighting, habitat management and enhancement for field birds.

3.2.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Avian Resources. Baseline conditions as described under Affected Environment would remain unchanged.

3.3 Bat Resources

3.3.1 Affected Environment

Introduction

The proposed turbine location is an old-field habitat surrounded by second growth forest, wetland, open water, and open grassland habitats. Old field habitat refers to abandoned agricultural land in the early stages of succession between meadow and forest, when grasses and wildflowers dominate, with scattered shrubs. A walking survey of the area revealed a low density of appropriately-sized snags that could contain roosting habitat for cavity- and bark-roosting bat species. The southeast corner of the project area, however, contained some taller snags that might provide suitable roosting habitat. Several small ponds and marshes surrounded the project site and could be used as foraging habitat by local bats.

Information for this section was taken from the *Phase I Bat Risk Assessment*, *Pre-Construction Acoustic Monitoring Report*, and *Supplemental Pre-Construction Acoustic Monitoring* reports prepared for the project. Additional information can be found in the reports, which are provided in Appendix 3. The existing bat resources at the site and within the general area are summarized below. Site visits, a literature search, a search of various databases, and acoustic monitoring were utilized to understand bat resources within the project area. A discussion of the USFWS Guidance on assessment of potential impacts to bats can be found in Section 3.2.1.

Methodology

A Phase 1 Bat Risk Assessment was conducted to determine the potential for bat habitat loss and collision mortality from the construction and operation of the proposed wind project. In addition to a Phase 1 Assessment, acoustic monitoring was

conducted. The Anabat™ SD-1 ultrasonic detection system is a cost effective procedure that gives a site-specific understanding of the baseline bat activity. Existing bat resources at the site and within the general area are summarized below.

The on-site evaluation was conducted in August 2008. The site visit assessed major habitat features associated with roosting and foraging activity by the species of bats likely to occur on or near the project area (e.g. dominant tree species, presence of tree snags, general tree size, presence of exposed rock outcrops, available water, and open field habitat).

The *Phase 1 Bat Risk Assessment* involved 1) an on-site evaluation to determine habitat features that may be predictive of bat usage, including roosting habitat, foraging habitat, and hibernacula; 2) a literature search to determine known populations of bats near the project site; and 3) consultation with appropriate MADFW and US Fish and Wildlife Service biologists to determine the presence of protected species or hibernacula near the project site.

The *Pre-Construction Acoustic Monitoring* involved Anabat™ SD-1 ultrasonic detection systems placed at various heights on the existing meteorological (met) tower. The met tower is within the approximate location of the proposed turbines. Three microphones were installed on the tower. The low microphone (LOW) was installed at 10 m altitude, the middle microphone (MID) was installed at 29 m altitude, and the high microphone (HIGH) was installed at 49 m altitude. Bat activity was monitored from 05 June through 11 November 2008. Spring activity for 2009 was also monitored using the detectors on the tower with an additional detector adjacent to the wetland and small pond.

Federal and State Listed Bat Species

Two listed bat species have been observed in Massachusetts: the federally endangered Indiana myotis (*Myotis sodalis*) and the state Species of Special Concern, the eastern small-footed myotis (*M. leibii*). Consultation with MADFW and the U.S. Fish and Wildlife Service (USFWS) was carried out to obtain information about the presence of protected species or migratory tree-bats in the region.

The USFWS listed the Indiana myotis as federally-endangered in 1967. Currently, most of the known population of Indiana myotis exists in hibernacula mainly located in Indiana, Kentucky, and Missouri. No existing Indiana myotis hibernacula are known from Massachusetts.

Although *M. leibii* is not federally protected, it is considered a species of management concern and has conservation status in most of the New England states (including Species of Special Concern in Massachusetts), and several states in the mid-Atlantic region, including Pennsylvania, Maryland, West Virginia, Tennessee, and Kentucky. The eastern small-footed myotis has an extensive distribution (from

Ontario to New England, southward to Georgia and westward to Oklahoma), although it is not considered common anywhere within its range.

MADFW identified caves and abandoned mines near the project site, but none of these sites were considered potential hibernacula. There appeared to be very little exposed rock habitat that could be used as roost sites by the eastern small-footed myotis (MA Species of Special Concern). Few data are available in the published literature pertaining to the distribution of eastern small-footed myotis in Massachusetts during both summer (reproductive) and winter (hibernation) periods. The only published winter record of eastern small-footed myotis in Massachusetts was provided by Veilleux (2007). A total of five eastern small-footed myotis was observed within Bat's Den Cave, in the town of Egremont, Berkshire County. No summer colonies are known from Massachusetts, although regional summer occurrences are available for New Hampshire.

Myotis spp., which contains four species including the federally-endangered Indiana myotis (*Myotis sodalis*) and the state Species of Special Concern eastern small-footed myotis (*Myotis leibii*), represented 30.6% of the total bat activity. The inability to reliably identify these two species from the other species within the genus *Myotis* limits the use of these data to quantify the potential presence or use of the project site by these species. However, a bat risk assessment of the project site determined that no *M. sodalis* have been documented during the summer in the state of Massachusetts and there are no documented *M. leibii* within 50 km of the project site. Given the proximity of the WMCC project site to suburban landscapes, it is likely that most, if not all of the *Myotis spp.* Activity can be attributed to the little brown myotis (*M. lucifugus*).

<u>Bats Likely to Occur at the Site</u>

A review of the literature, including analysis of the New England Bat Colony database (S. Reynolds, unpublished data) revealed that the Worcester County region has a relatively diverse bat community. Of the species of bats that have been observed in Massachusetts, several have geographical ranges that occur within Worcester County, or in the surrounding counties as listed below:

- Little brown myotis (*Myotis lucifugus)*
- Northern myotis (*Myotis septentrionalis)*
- Hoary bat (*Lasiurus cinereus)*
- Silver-haired bat (*Lasionycteris noctivagans)*
- Eastern red bat (*Lasiurus borealis)*
- Eastern pipistrelle or tricolor bat (*Perimyotis subflavus)*
- Big brown bat (*Eptesicus fuscus)*

Acoustic monitoring was carried out and the data was analyzed. During the summer-fall 2009 sampling period, a total of 2,150 bat calls were recorded and identified at the project site. 80% of the total bat activity was detected at the LOW microphone well below the rotor sweep zone of the turbine. Less than 1% of the total bat activity was heard at the HIGH microphone, within the rotor seep zone. All species of migratory tree bats, the hoary bat, red bat, and the silver-haired bat were detected during the sampling period.

Patterns of bat activity (evening temporal data, altitudinal variation, and species composition) are more consistent with summer foraging and commuting activity than migratory activity. This will be further assessed after the spring 2009 monitoring. Roost surveys of Worcester County and the acoustic data collected at the site suggests a significant resident bat population in the area that is dominated by the big brown bat and little brown myotis.

To reduce errors in identification of species, the silver-haired bats and big brown bats were put in a single group. The genus Myotis was considered one group because of high variation in calls within the group. The *Myotis* spp. bats were the dominant bats heard at the LOW microphone. The silver-haired/big brown bat group (*Lnoct-Efus*) and the hoary bat (*L. cinereus*) were the dominant groups heard at the MID microphone. Only one bat call was detected at the HIGH microphone, which was identified as a hoary bat (*L. cinereus*).

For all microphones, the highest percent of activity came from the silver-haired/big brown bat group (54.0%). Given the relatively urban landscape surrounding the project site, it is highly likely that most of the calls from the silver-haired/big brown species group were from the big brown bat, a house-roosting bat that is well documented within the area. The *Myotis group*, represented 30.6% of the total bat activity, the second highest percentage. Given the proximity of the WMCC project site to suburban landscapes, it is likely that most, if not all of the *Myotis spp*. can be attributed to the little brown myotis. Within the *Myotis spp*. group, most of the activity was detected at the LOW microphone (90.4%), well below the rotor sweep zone of the turbines. The hoary bat represented the third highest percentage of the total activity (10.7%), mostly at the MID detector.

Data collected at the site, compared to pre-construction studies for other wind projects, suggest medium levels of bat activity for the summer and fall sampling period. The spring studies are consistent with the fall data.

3.3.2 Environmental Consequences of Proposed Action

Most bat mortality appears to occur during migration. Surveys from across North America suggest that migratory tree bats (hoary bats, red bats, and silver-haired bats) have higher mortality rates at wind turbine sites than other species. The reason for these species being at higher risk of collision mortality is uncertain. It is likely that

the large geographic ranges and the long-distance migratory behavior of these species expose them to a higher risk of turbine-related collision mortality.

Federal and State listed species

Based on the on-site survey and consultation with the MADFW and USFWS, there are no data to suggest that protected bat species reside on or near the project site. It is unlikely that populations of either the eastern small-footed myotis or the Indiana myotis will be impacted by development of the project.

Bats within the *Myotis spp* group cannot be reliably identified using acoustic signature. The *Myotis* species represented 30% of total bat activity detected at the site. Myotis spp. includes four species including the two listed bat species *M. sodalis* and *M. leibii* and the state species of special concern eastern small footed myotis, *M leibii*. However, over 90% of the bat activity from *Myotis spp.* occurred at the LOW microphone, below the rotor sweep zone, and none occurred at the HIGH microphone within the rotor sweep zone of the proposed wind turbine.

Given the lack of documented *M. leibii* and *M. sodalis* within 50 km of the project site and the proximity of the site to suburban landscapes, it is likely that most, if not all of the *Myotis spp*. activity can be attributed to the little brown myotis (*M lucifugus*).

Other bats

Hoary bats, the most commonly killed bat at wind sites (Arnett 2005), represented approximately 11% of the total bat activity. However, this is a lower percentage of total activity than seen at many pre-construction acoustic monitoring surveys.

Summary of Bat Environmental Consequences

Based on the data summarized above and discussed in detail in reports included as Appendix 3, fatality numbers at the project site are likely to be similar in composition but lower in magnitude (on a per turbine basis) to other wind projects sites in the northeastern United States. Given the size of the project, it is unlikely to adversely impact bat populations in the region. Additional acoustic monitoring is underway for Spring 2009 (March 15 – June 15).

During the on-site evaluation, potential roosting habitat was observed in the southeast corner of the project area. No construction is proposed in this area and therefore there will be no impacts to potential roosting habitat. The wind turbines will be not placed on the field edge or adjacent to the pond and wetland habitat and will therefore not impact the area where commuting and foraging bats would be at a higher density.

3.3.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Bat Resources. Baseline conditions as described under Affected Environment would remain unchanged.

3.4 Wetland Resources

3.4.1 Affected Environment

Information on wetlands resources within the area was obtained from the MassGIS database, site walks, and wetland site delineation. Additional information can be found in the wetland delineation report from Haines Hydrogeologic Consulting (November 26, 2008) provided in Appendix 6.1. The project site is adjacent to a wetland system that contains a pond, brook, shallow fresh marsh, shrub swamp and wet meadow. The wetland system is tributary to Crystal Lake, a public water supply for the City of Gardner. A wet meadow extends up into the open field. The brook is not shown on the USGS map and is therefore assumed to be an intermittent stream. Land Under Water consists of the land under the pond. There is an isolated wetland in the northwester portion of the field.

The Bordering Vegetated Wetlands (BVW) were field delineated and surveyed using the three technical criteria of vegetation, soils, and hydrology. The BVW vegetation includes Red Maple, Arrowwood, Red Osier Dogwood, Steeplebush, Meadowsweet, sedges, rushes, goldenrod, Dew berry, New England Aster, Cattail, and Sphagnum Moss. The wetland soils consist of seasonally saturated dark brown to black silty loam over mottled subsoil. A finger of BVW extends up into the field and is likely the result of a drainage outfall from the Courthouse. The 100-foot Buffer Zone for the BVW extends 100 feet landward in the upland portion of the property.

The Gardner Conservation Commission (GCC) reviewed the wetland delineation. They approved the delineation and issue a Determination of Applicability in December 2008 (provided in Appendix 6.2).

3.4.2 Environmental Consequences of Proposed Action

Construction of the access road will result in an unavoidable impact of approximately 2,500 SF to the isolated vegetated wetland. A Notice of Intent was filed with the Commission pursuant to the Massachusetts Wetlands Protection Act and the Gardner Wetland Ordinance for work in the Buffer Zone of the BVW and impacts to the isolated wetland. The New England District of the U.S. Army Corps of Engineers has issued a Programmatic General Permit for projects with minimal impact work in wetlands. The project would qualify under Category 1, Non

Reporting because there is less than 5,000 SF of impact (temporary and permanent) and will comply with the PGP terms and conditions.

Approximately 2,500 SF of the isolated wetland in the northwestern portion of the field will be unavoidably altered to construct the access road, as shown on Figure 3 Site Base Plan C-1A. The GCC issued an Order of Conditions for the project in November 2009 (provided in Appendix 6.3). Wetland replication of 2,600 SF is proposed adjacent to the areas and is an applicant committed measure.

3.4.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Wetlands. Baseline conditions as described under Affected Environment would remain unchanged.

3.5 Land Use

3.5.1 Affected Environment

The College is located on approximately 300 acres of state owned land. The developed portion of the College campus consists of the main academic building, the Fitness and Wellness center, facilities buildings, parking lots and access roads. Other areas on the parcel include wooded areas, expanses of lawn, wetland areas, and a 13-acre field south of the main building which is the proposed project site. Land use surrounding the College includes a district court, hospital, golf course and residential areas.

3.5.2 Environmental Consequences of Proposed Action

The project would result in the temporary disturbance of approximately 5 acres during construction for the turbine bases and the access road during construction. Most of this area would be restored with a smaller area of the field permanently converted for the gravel access road and turbine pads.

The applicant is committed to implement erosion controls (haybales and silt fence) during construction, and complete field restoration to mitigate for the temporary construction impacts to the field. No adverse impacts to land use are anticipated.

3.5.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Land Use.

Baseline conditions as described under Affected Environment would remain unchanged.

3.6 Aviation Resources

3.6.1 Affected Environment

The proposed wind turbine site lies 2.6 nautical miles (16,161-feet) from Gardner Municipal Airport in Gardner, MA. The Airport (GDM- FAA identifier) is a public use airport with a single 2,999-foot long runway. The airport has a single non-precision circle to land instrument approach procedure with non-standard instrument departure minimums. There is no published instrument departure procedure for the airport.

3.6.2 Environmental Consequences of Proposed Action

An aeronautical study, completed by Aviation Systems Inc. and provided in Appendix 1, evaluated potential obstructions to Federal Aviation Administration (FAA) airspace surfaces. A similar process was carried out for the met tower. The FAA requires notice prior to the construction of any structure that is greater than 200 feet above ground level or within certain distance criteria from an airport. During the preparation of the Feasibility Study for the project, the Federal Aviation Administration (FAA) was asked to review the project. FAA issued a Determination of No Hazard to Air Navigation for the 415-foot maximum height. Based on subsequent survey and evaluations completed during the preparation of the EA, the proposed location for the turbines has been shifted approximately 100 feet east. This location is approximately 8 feet higher. As part of the ongoing preliminary design effort, the revised location will be submitted to FAA to update the Determination. The 2008 determinations are provided as Appendix 1. Therefore, no significant impacts to aviation resources are anticipated.

3.6.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Aviation Resources. Baseline conditions as described under Affected Environment would remain unchanged.

3.7 Electromagnetic Interference

3.7.1 Affected Environment

Electromagnetic Interference (EMI) is any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment. Due to the electricity-generating part of the

wind turbine that contains rotating magnets and current-carrying wires, wind turbines can potentially cause electric and magnetic fields (EMF), which are a type of EMI (National Institute of Environmental Health Sciences, 2002). However, the windings of the electric generator are close together and are surrounded by an electrically-conductive metal cover, so the EMF-EMIs outside the turbine are very low. The electric and magnetic field (EMF) aspects of the proposed wind turbine project were evaluated to determine whether operation of wind turbines would interfere with signal reception for radio stations. Health effects of power-line EMF were also evaluated. Information for this summary was taken directly from the report by Peter Valberg, *Radiofrequency, (RF) Impact of Mt. Wachusett Community College Wind Turbines*, February 3, 2009, which is provided as Appendix 4. The nearest radio station is WGAW, an AM radio station operating at 1,340 kilohertz (kHz) located on Green Street across from the College. The tower for the radio station is over 1,000 feet from the 2 proposed turbines.

The "electromagnetic spectrum" refers to oscillating (time-varying) electric and magnetic fields. Different regions of the spectrum are characterized by the oscillation frequency, as given in units of cycles per second, or "Hertz" abbreviated as Hz. The spectrum encompasses frequencies from below the kilohertz range (kHz, 1,000's of Hertz) up through microwaves (gigahertz, GHz, or billions of Hertz) and on up in frequency into infrared, light, ultraviolet, and X-rays. Visible light is the major source of electromagnetic energy in our environment. The human body generates heat energy (electromagnetic energy in the infrared portion of the spectrum). The radiofrequency (RF) portion of the electromagnetic spectrum is at a lower frequency than infrared (heat) radiation, and below the "ionizing" portion of the spectrum. There are many sources of RF energy in our environment such as radio, TV, cell phones, pagers, and microwave ovens.

3.7.2 Environmental Consequences of Proposed Action

There are two ways that wind turbines may interfere with communications infrastructure:

1. The presence of the turbines could physically block reception of the signal through shadowing or ghosting.

2. Physical rotation of the wind turbine generator, and transformation of the electric power to 60 Hz, will produce electric and magnetic fields with certain frequencies on the electromagnetic spectrum, which could potentially add or partially cancel the electromagnetic waves produced by the radio station.

Shadowing is similar to objects blocking sunlight and casting shadows. Large obstacles can block radio and other communication waves and cast "shadows." The ability to cast a shadow depends upon the how the wavelength of the electromagnetic wave compares to the size of the blocking object. The wavelength of WGAW's broadcast frequency is about 224 meters, and the turbine blade tip-to-tip diameter is

about 88 meters, with the width of the blades being far less, about 3.5 meters. Turbine blades with these dimensions are not able to block radio signals that have wavelengths much larger than the turbine's physical dimensions.

Ghosting is similar to shadowing but is due to intermittent reflections of the radio waves from the rotating turbine blades, which may then lead to constructive or destructive interference between direct and reflected radio waves at the reception point. As in the case of shadowing, the ability to reflect radio waves depends upon the relative size of the radio waves and the object they may reflect from. Because the radio station is over 1000 feet distant from the wind turbines, the amount of RF power reaching the turbine blades is a tiny fraction of total radiated power, *i.e.*, approximately 0.013%. As a fraction of the RF field strength reaching the turbine blades, the proportion of RF scattered by each wind turbine would be, at most, roughly in the ratio of blade length to RF wavelength, or about 1.6% (3.5 / 224). Energy is approximately $[(3.5)\times(3.28)]^2$ / $[(1000)^2]$ or 0.0132% Thus, the reflected waves will have very little energy compared to the direct waves. Consequently, no ghosting interference is expected from the turbines.

Direct electromagnetic waves coming from wind turbines is caused from the rotation of the blades which rotate at anywhere from 14 to 20 rpm and generate AC power at a 60-Hz frequency. The power generated by the turbines will be transmitted through an underground cable to the College. The possibility of interference with radio-station signals *via* the mechanism whereby the two different frequencies of electromagnetic fields could add and subtract to produce harmonics at the added and subtracted frequencies was evaluated. Because the frequency of electromagnetic waves from the turbine output (60 Hz) and the frequency of the radio station (1,340 kHz or 1,340,000 Hz) are so far apart, no distortion from adding and subtracting these frequencies would be anticipated.

Health effects of power-line EMF were also evaluated. No electric field will be created because of the underground alignment of the conductors and the electrically conducting shell of the turbines. For magnetic fields, it can be expected that the power-line magnetic fields immediately nearby will be lower than 5 milliGauss (mG), which is lower than typical magnetic field levels found in the vicinity of some household appliances (National Institute of Environmental Health Sciences, 2002. There is no expectation of adverse health risks.

In summary, the proposed electric-power wind turbines would not cause interference with radio reception from the WGAW AM radio station. Furthermore, the EMF produced by the electrical equipment associated with the turbines and their interconnects to the College would not only be localized to the immediate vicinity of this equipment, but would also be far below any available guideline levels for EMF that are protective of public health.

3.7.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Electro Magnetic Interference. Baseline conditions as described under Affected Environment would remain unchanged.

3.8 Visual Resources

Information for this section was taken from *Mount Wachusett Community College Wind Turbine Visualizations* prepared by the University of Massachusetts, Wind Energy Center (UMass). Additional information can be found in the report which is provided in Appendix 5.

3.8.1 Affected Environment

The University of Massachusetts Wind Energy Center performed a visual impact analysis for the project. A potential visual impact map was prepared. The selected sites utilized for photo simulations have the most potential for visual impact from the proposed wind project and are representative of the viewpoint from each area. At each site photographs were taken and precise locations identified and utilized to prepare renderings using WindPRO software. The program uses turbine specifications, geometry and site-specific base-photographs to produce photo realistic renderings. Turbine model Vestas V82 1.65MW with an 80m hub height was used for these studies. The location of each viewpoint is listed in Table 3-2 and shown on Figure 4. All photo simulations are included in the full visualization report included in the appendix.

Table 3-2_ Viewpoints for Photo Visualizations

Viewpoints	Distance to turbines (meters)		Location/Description
	Turbine 1,	Turbine 2	
1	1040	1203	Matthews St
2	478	285	Hospital
3	724	902	Green St
4	387	404	Boulder Dr.
5	1661	1462	Osgood St
6	1199	1342	Golf Course
7	883	1080	Eaton St
8	1519	1322	Park St

Source: Adapted from Wind Turbine Visualizations, UMass, Wind Energy Center, April 30, 2009

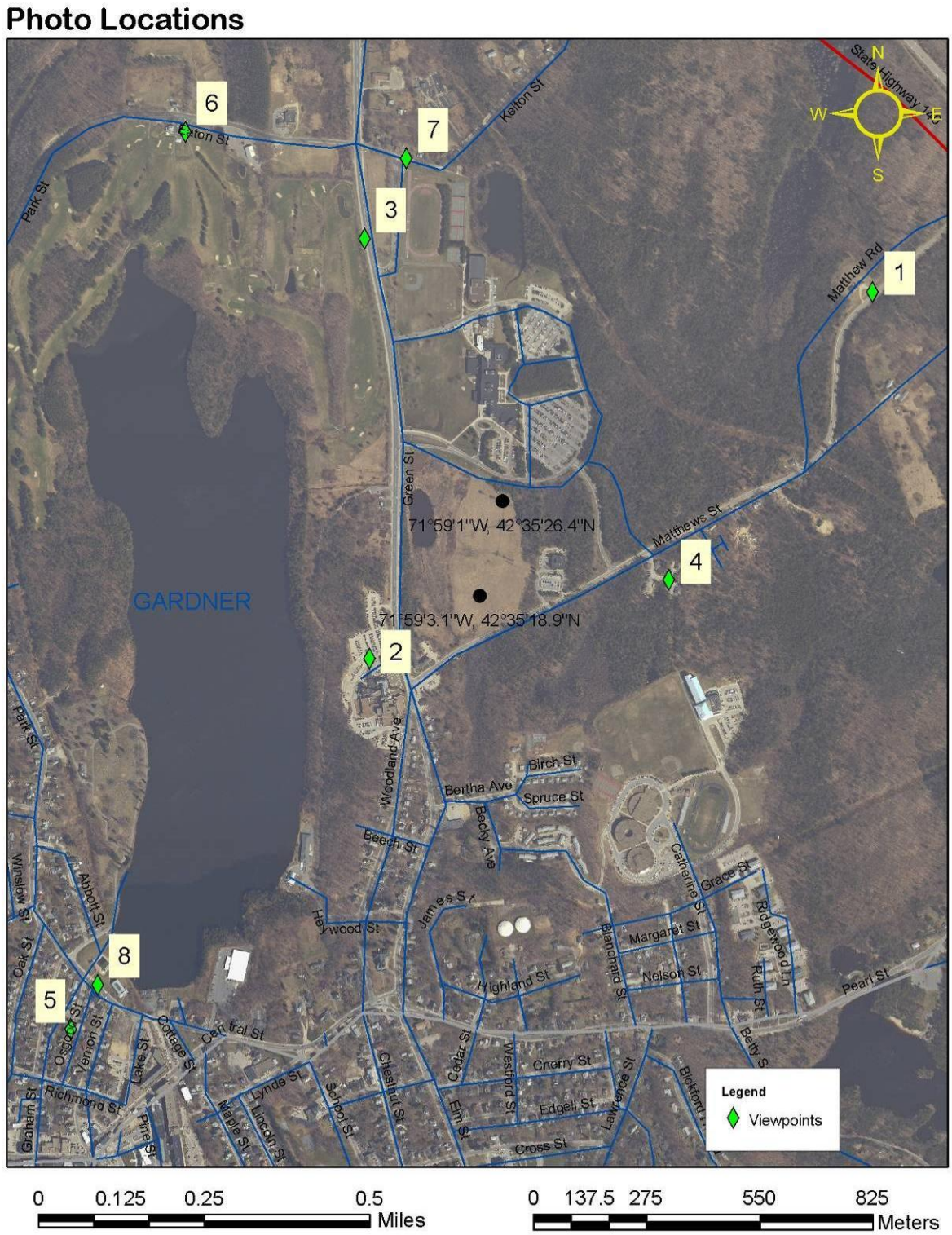


Figure 4 Locations Of Viewpoints For Visualization Study.
Source: UMass, Wind Energy Center,

3.8.2. Environmental Consequences of Proposed Action

Photo simulations were prepared using Photomontage module of WindPRO software. The results are summarized in Table 3-3. Other viewpoints closer to the center of the City were considered but eliminated because the turbines would not be visible. Selected photo simulations are provided in Figures 5 and 6. Photos of all the viewpoints can be seen in Appendix 5.

Table 3-3_ Photo Simulation Results

Viewpoints	Location/Description	Results
1	Matthews St	The blades of the north turbine are visible above the trees but the south turbine is not visible behind the evergreen trees.
2	Hospital	Both turbines are very visible.
3	Green St	From view of the MWCC campus both turbines clearly visible.
4	Boulder Dr.	The tips of the turbine blades of the north turbine can be seen above the tops of the trees. The blades of the south turbine can also be seen through the bare tree branches.
5	Osgood St	The blades of both turbines can be seen through the tree branches above the rooftops of the houses.
6	Golf Course	From this viewpoint both of the turbines are clearly visible.
7	Eaton St	From this viewpoint both of the turbines are clearly visible.
8	Park St	The blades of both turbines are clearly visible above the tree line.

Source: Wind Turbine Visualizations, UMass, Wind Energy Center, April 30, 2009

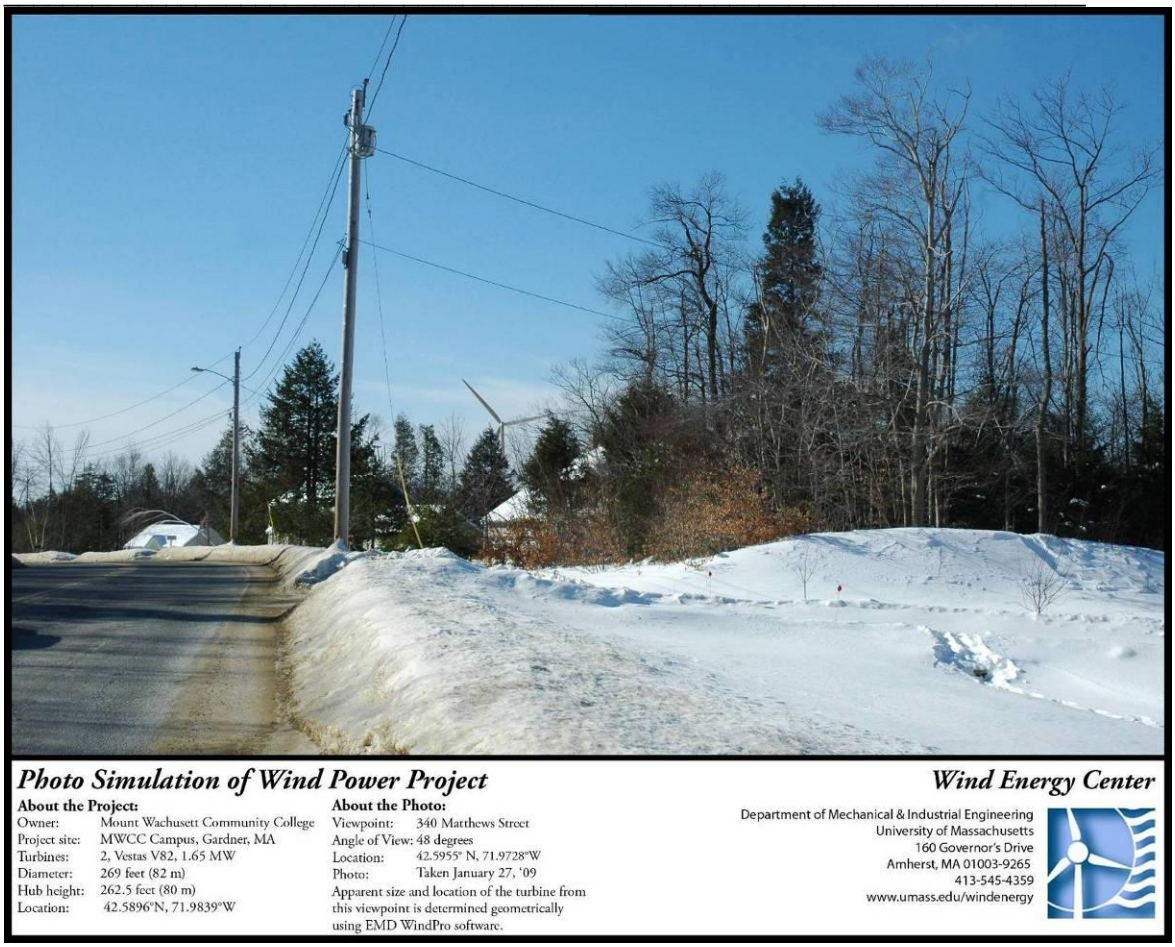


Figure 5 Photo Simulation at Matthews Street
Only Turbine 1 is visible.

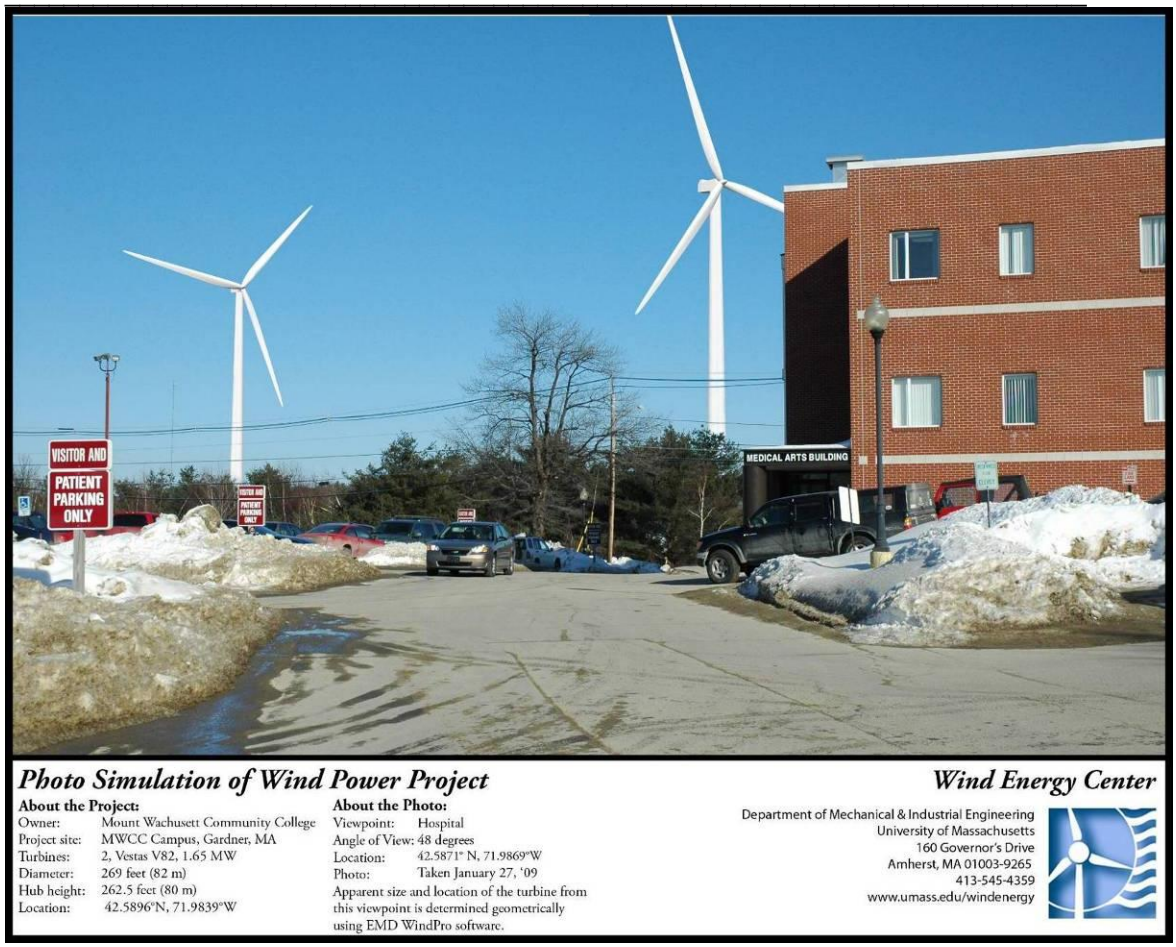


Figure 6 Photo Simulation From Hospital.
Both wind turbines are clearly visible.

3.8.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Visual Resources. Baseline conditions as described under Affected Environment would remain unchanged.

3.9 Shadow Flicker

Information for this section was taken from *Mount Wachusett Community College Shadow Flicker Analysis* prepared by the University of Massachusetts, Wind Energy Center (UMass). Additional information can be found in the report which is provided in Appendix 8.

3.9.1 Affected Environment

The University of Massachusetts Wind Energy Center performed a shadow flicker analysis for the proposed two turbine wind power installation at the Mount Wachusett Community College in Gardner, MA. A shadow flicker analysis uses geometry and site-specific data inputs to determine an estimated number of hours per year that a flickering shadow can be cast on a given receptor site or viewing area. Shadow flicker is a periodic obstruction of light. It is the term used to describe what happens when rotating turbine blades come between the viewer and the sun, causing a moving shadow.

Shadow flicker is usually quantified by the number of hours per year during which a location would be exposed to flickering from nearby wind turbines. While this is primarily a matter of geometry, other factors must be considered; even at times when the sun is lined up geometrically with the turbine and the receptor, various factors may prevent flicker. For instance, it is not possible for shadow flicker to occur when the sun is not visible, such as on cloudy or foggy days, or if a wind turbine is not rotating or is turned toward the wind in such a manner that the blades would not cast a shadow on the receptor site. Obstacles located between a wind turbine and the viewer, such as trees, hills, and buildings, will reduce or eliminate the duration and/or intensity of shadow flicker.

The study considered flicker at distances of up to 2 km from the proposed wind site. However, at distances greater than approximately one kilometer (0.6 miles), light is sufficiently dispersed by particles in the air that the blades no longer produce distinct shadows.

The receptors identified for the shadow flicker study are listed in Table 3-4. The locations can be seen on Figure 7.

Table 3-4_ Shadow Flicker Receptors

Shadow Receptor	Distance to Turbines (meters)		Location/Description
	Turbine 1,	Turbine 2	
A	184	200	Courthouse
B	478	285	Hospital
C	387	404	Boulder Dr,
D	398	496	Golf Course
E	216	434	MWCC Building
F	883	1080	Eaton St
G	626	554	Gardner Middle School

Source: Adapted from Shadow Flicker Analysis, UMass, Wind Energy Center, May 19 2009

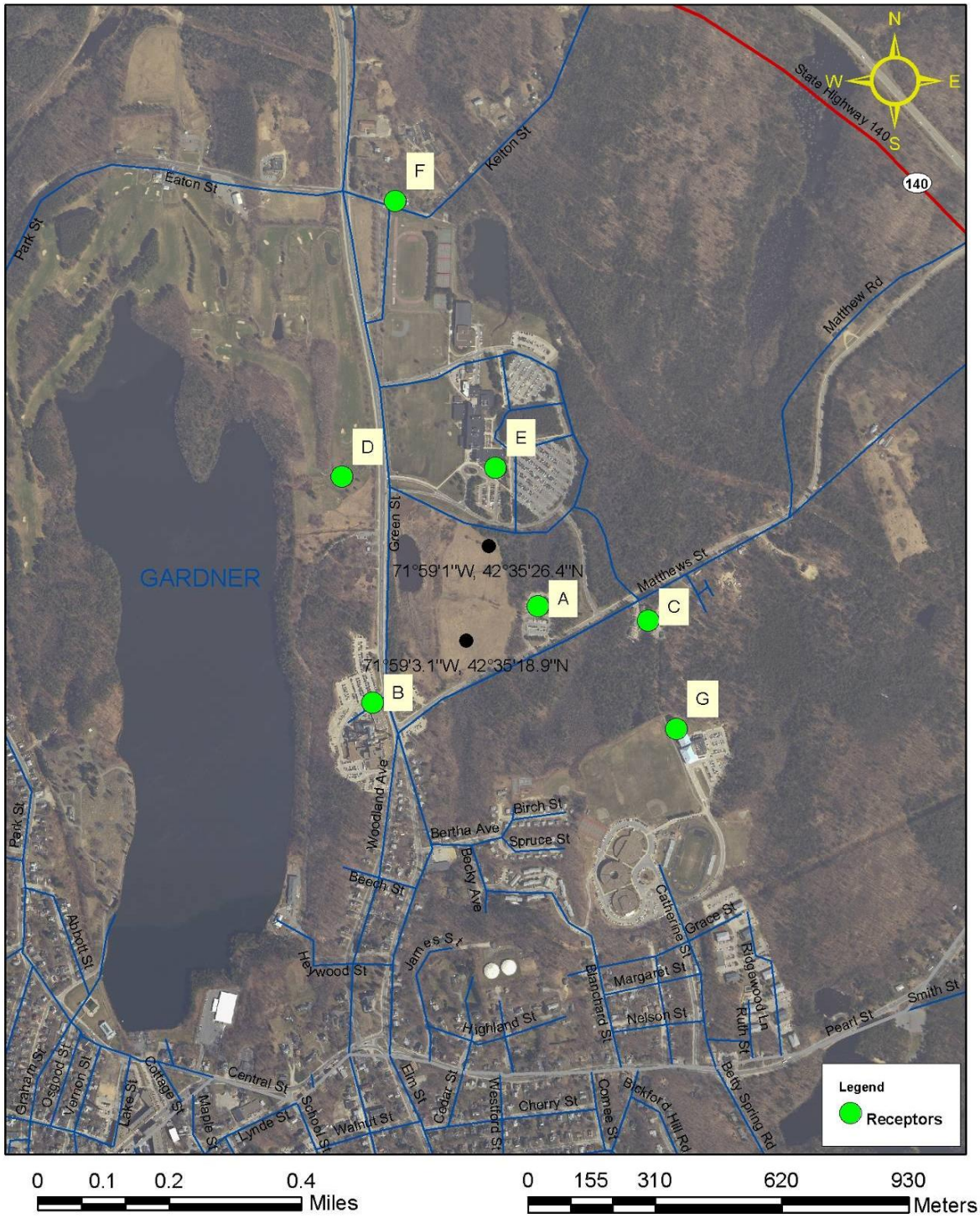


Figure 7 **Location of Shadow Flicker Receptors**

3.9.2. Environmental Consequences of Proposed Action

Shadow Flicker

The flicker impacts at seven locations nearby the proposed turbine sites have been estimated. Analyses were carried out for two Vestas V82 1.65 MW turbines. The duration and season of expected impact varies according to receptor location. Table 3-5 summarizes flicker duration at each of the receptors. Shadow flicker maps for the two turbines are provided in Appendix 8 for the surrounding area. Shadow calendars, which illustrate the season and time and of day flicker can be expected, are also provided in Appendix 8.

Table 3-5_ Shadow Flicker Results

Shadow Receptor	Shadow, hrs/year (hours : minutes) worst case	Shadow days/year	Max Shadow hrs/day (hours : minutes)	Expected Shadow hrs/year (hours : minutes)
A	135:21	119	1:29	53:07
B	0:00	0	0:00	0:00
C	88:36	135	0:52	33:10
D	58:14	107	0:47	18:47
E	90:32	76	1:26	25:23
F	0:00	0	0:00	0:00
G	47:43	96	0:37	17:26

Source: Shadow Flicker Analysis, UMass, Wind Energy Center, May 19, 2009

Receptor A, the Courthouse, is located near the base of the turbine, and shadow flicker will occur most often at this location. Shadow flicker generally decreases as the distance between a receptor and the turbines increases.

The number of hours of shadow flicker per year has been estimated through computer simulations for seven shadow receptors nearby the proposed turbine site in Gardner, MA. Shadow flicker maps for the area surrounding the proposed site have been generated, and estimated flicker durations at each receptor site have been tabulated. This analysis is designed to be conservative and therefore the actual number of shadow hours will likely be less than estimates presented here.

Two shadow receptor locations (A and C) could potentially experience more than 30 hours of flicker per year. The Courthouse (receptor A) would experience the greatest number of hours of flicker (53 hours, 7 minutes). This flicker would occur as a result of the southern turbine's location. There are trees located between the turbine and the Courthouse which are likely to reduce flicker impact at the Courthouse. Potential flicker impact would nearly always be after 3:00 pm.

The Boulder Drive neighborhood (receptor C) is surrounded by trees that are likely to lower the number of hours of flicker at this location, especially since late in the day the sun angle is low. At this location, flicker from the north turbine is possible from May through July between about 6:45pm and 8 pm. In general, wind speeds are lower during the summer than during other seasons of the year, and so actual flicker durations may be further reduced during this time as a result of the blades not turning. Flicker from the south turbine is possible in February through early April and again between September and early November from about 5 pm to 7 pm.

Several other locations are expected to see some flicker impacts. The College campus building (receptor E) to the north of the turbines is expected to receive approximately 25.5 hours of flicker per year. The results of the analysis indicate that the Golf Course (receptor D) located to the west of the turbines will experience approximately 18.5 hours of flicker per year. The Gardner Middle School (receptor G) is expected to receive approximately 17.5 hours of flicker per year. There are also several residences located to the east of receptor C that are expected to have between 0.015-25 hours of shadow flicker per year.

The hospital (receptor B) and the residences near the intersection of Eaton and Kelton Street (receptor F) are not expected to experience any flicker.

Modern utility-scale wind turbines (600 – 3,000 kW) are typically three-bladed machines that rotate at rates of 26 – 12 revolutions per minute (RPM), respectively. If, for example, sunlight passes through the rotor of a three-bladed wind turbine rotating at 20 RPM, then the light will flicker at a rate of 3x20=60 shadows per minute, i.e. 1 per second, or 1 Hertz (Hz). Such low frequencies are harmless in terms of health and safety. While flickering light in the ranges of about 5–30 Hz can cause seizures in sensitive individuals, rates of less than 2 Hz such as those associated with wind turbines do not (Erba, 2006).

Shadow flicker can be controlled both by trees situated between the turbines and the receptor site and/or programming the automated controls of the turbines to shut the machines down at times of unacceptable shadow flicker impacts. The receptor sites indicated as having potentially significant impact in the Shadow Flicker study are largely blocked from the turbines by heavy existing tree cover. The impact at those sites occurs very few hours of the year. However, if the College receives complaints from residential property owners regarding the shadow flicker, the College is committed to programming the automated control system to shut down the turbines at the easily determined times such impact may occur.

3.9.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Visual Resources.

Baseline conditions as described under Affected Environment would remain unchanged.

3.10 Noise

Information for this section was taken from *Mount Wachusett Community College Turbine Sound Analysis* prepared by the University of Massachusetts Wind Energy Center (WEC). The complete report with additional information is provided in Appendix 7.

3.10.1 Affected Environment

WEC performed a sound analysis for the proposed turbines. The sound analysis was completed using the "Decibel" module of WindPRO software version 2.6.1.252. The program uses turbine specifications, topography, and site-specific data inputs to determine the estimated decibel levels coming from the turbines at each location or Noise Impact Area.

The sound impacts at five locations (Noise Impact Areas) listed in Table 3-6, near the proposed turbine site were estimated. Analyses were carried out for turbine model Vestas V82 1.65MW (80m hub height).

Table 3-6_ Locations of Noise Impact Areas

NIA	Name *	Location UTM NAD 83	Distance Turbine 1, (meters)	Distance to Turbine 2 (meters)
A	Hospital Adm. Bldg	42°35'13.66"N, 71°59'8.58"W	401	192
B	Boulder Drive*	42°35'20.77"N, 71°58'44.76"W	370	380
C	MWCC Building*	42°35'32.78"N, 71°59'1.30"W	208	423
D	Hospital*	42°35'13.43"N, 71°59'12.82"W	445	250
E	Courthouse	42°35'21.76"N, 71°58'55.11"W	153	167

* Indicates Noise Sensitive Receptor

The locations (see Figure 8) near the turbines were chosen to be used as Noise Impact Areas in the WindPRO simulation due to their proximity to the project site and their likelihood to be most impacted by sound from the wind turbines. Three of the five locations are noise sensitive receptors because they are residential, hospital or school sites. However, the college site does not have residential dormitories. Sites further away are unlikely to be impacted by sound from the wind turbines in any noticeable way.

Figure 8 **Location of Noise Impact Areas**

3.10.2 Environmental Consequences of Proposed Action

Table 3-7 summarizes decibel output at each of the five Noise Impact Areas for the two turbines under consideration. This table shows the estimated values of maximum decibel levels for each location for two turbines, for the turbines plus ambient sound and the maximum additional exposure above ambient sound levels (last column).

WindPRO adds the sound levels from each turbine to estimate the sound level that will be produced by the two turbines together. A map provided in the report in Appendix 7 graphically shows the different sound levels calculated from the WindPRO Decibel simulation for the two Vestas V82 turbines. The full WindPRO calculation report can also be found in the report. The assumptions employed in the calculations were chosen in order to arrive at a conservative estimate.

Table 3-7_ Estimated Sound Level Results at Noise Impact Areas (NIA)

NIA	**Name**	**Max Sound Levels Turbines** dB(A)	**Max Sound Levels Turbine + Ambient** dB(A)	**Max additional exposure** dB(A)
A	Hospital Adm. Bldg	46.0	49.1	6.9
B	Boulder Drive	41.8	47.6	4.0
C	MWCC Building	45.3	48.8	6.3
D	Hospital	43.9	48.2	5.4
E	Courthouse	49.2	51.0	9.6**

**Sites A and E are not Noise Sensitive Receptors

The sound levels at the Noise Impact Areas have been estimated through computer simulations for five areas nearby the proposed turbine site at MWCC in Gardner, MA. Sound Level maps for the area surrounding the proposed site have been generated, and estimated sound levels at each Noise Impact Area have been tabulated. The ambient sound levels were not measured at the Gardner site. Data from a WEC study in Templeton, MA was used for the WindPRO analysis in this study. The ambient sound levels in Gardner are most likely higher since the Templeton site is a quieter setting.

Massachusetts regulates noise as a form of air pollution under the Air Pollution Control Regulations, 310 CMR 7.10. The DEP Noise Policy includes criteria Massachusetts Department of environmental protection (Mass DEP) uses to evaluate noise impacts at occupied residences, or other sensitive receptors such as schools and hospitals. If the noise level at a sensitive receptor's location increases by more than 10 decibels above ambient levels, noise mitigation would be required.

None of the locations will have an increase of 10 dB(A) over ambient levels. Although the Courthouse would have an increase of 9.6, close to the 10 threshold, the courthouse is not a sensitive receptor.

The maximum additional exposure at the Courthouse site would be 9.6 which is close to 10, the Mass DEP limit for noise sensitive receptors. However, the Courthouse would not be considered a regulated sensitive receptor. In addition it is assumed that the Courthouse building is air conditioned and that all courthouse activities take place indoors. Outside at the courthouse, the noise level from the wind turbines is estimated to be approximately the same as the background noise in a quiet business office. The vegetation is not as dense at the Courthouse, Hospital and the College building and the effect of ground attenuation may be lower than in a heavily wooded area such as Boulder Drive. Outside at the other Noise Impact Areas, the noise level from the wind turbines is estimated to be below that level, somewhere between the noise level of a residential area at night and a quiet business office. Table 3-8 provides noise levels of common environmental sounds for comparison. This study does not evaluate whether these levels of sound can be heard at all above ambient noise levels at the Noise Impact Areas. It is unlikely that the proposed wind turbines will have noticeable sound impact at areas further from the project site than the selected Noise Impact Areas.

Table 3-8 _Decibel levels of Environmental Sounds

dBA	Source
120-140	Produces Pain
130	Jet Aircraft During Takeoff (at 20 meters)
120	Snowmobile, Tractor Without Cab
110	Rock Concert
100-105	Chain Saw
95 to 100 dB	Home Lawn Mowers
90	Semi-trailers (at 20 meters)
Above 80	Discomfort Level
80	Heavy Traffic
70	Automobile (at 20 meters)
65	Vacuum Cleaner
60	Conversational Speech (at 1 meter)
50	Quiet Business Office
40	Residential Area at Night
20	Whisper, Rustle of Leaves
10	Rustle of Leaves
0	Threshold of Audibility

Source: OSHAX.org.

3.10.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Noise. Baseline conditions as described under Affected Environment would remain unchanged.

3.11 Health and Safety

3.11.1 Affected Environment

The project area was evaluated for existing public safety hazards. Potential hazards include the existing meteorological tower. The site is monitored on a daily basis. No safety incidents have been reported.

3.11.2 Environmental Consequences of Proposed Action

Health and safety consequences of the Proposed Action would include construction phase issues and operational issues.

During the construction phase, the Contractor would be responsible for a Health and Safety Plan that addresses hoisting and rigging operations, construction vehicle traffic circulation, and public safety near the work area. The Contractor would be expected to comply with all OSHA regulations.

Operational health and safety issues discussed in this section relate to ice throw from the wind turbines. Health and safety relative to EMI is discussed in Section 3.7. Health and safety relative to shadow flicker is discussed in Section 3.8.

Under certain atmospheric conditions such as freezing rain or sleet, ice can build up on wind turbine rotor blades. When the turbine is not operating, the ice will eventually fall to the ground below. When the turbine is operating, ice fragments which detach from the blades can potentially be thrown from the turbine. The accumulation of ice is dependent on local weather condition and the turbine's operation. A literature search was conducted in order to evaluate the potential for impacts from ice throw. One study (Garrad Hassan 2007) suggests that ice fragments typically land within approximately 300 feet of the wind turbine. At distances greater than 700 feet, the risk of fragments appears to be very low. Additionally, anecdotal evidence suggests that ice fragments are more likely to drop off rather than be thrown off the rotors.

The wind turbine industry has developed mitigation measures for ice prone conditions. The College is committed to incorporating measures into the operational plan for the proposed turbines. Turbines are designed to automatically turn off if the blades are not balanced. Since ice formation would cause an imbalance, the turbines will shut themselves off if there is enough ice formation on the blades to cause the

imbalance. The ice will eventually melt and fall directly below the turbines. As part of the College's operational plan the turbines will visibly be inspected before they are turned back on.

In summary, with mitigation measures incorporated into the operational plan for the wind turbines, impacts from ice shedding and ice throw are not expected to be significant.

3.11.3 Environmental Consequences of No Action

Under the No Action alternative, DOE would not provide funding to the College to construct the proposed wind energy project. The project would not be built as part of a Federal Action, and there would be no Federal Action impacts to Health and Safety. Baseline conditions as described under Affected Environment would remain unchanged.

CHAPTER 4 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

The irreversible commitment of resources is the use of non-renewable resources including fossil fuel, construction materials, fiscal resources, cultural resources, biological resources, and land converted to long term project use.

Labor, materials and energy would be expended for the project. Approximately one acre of land would be occupied for the access road and turbine site. Wildlife habitat and individuals of some species could be lost during construction and operation of the project.

Fossil fuel, construction material, and human labor would be used during the construction of the project. Up to two wind turbines would be committed to the project. These resources are generally in sufficient supply and would not have an adverse effect on the availability of wind turbines for other wind energy projects.

An area within an isolated vegetated wetland would be altered but wetland replication is proposed. Wildlife habitat loss and bird and bat mortality would occur as a result of the project. However, due to project location, small scale of the project and the absence of federal or state listed species, the loss is not expected to be biologically significant. Habitat enhancement and post construction mortality studies are proposed to minimize impact.

The proposed project would have long term positive benefits because it would displace carbon-generated power and reduce the consumption of fossil fuels. This would ultimately result in a reduction in greenhouse gases.

The proposed commitment of natural, physical, human and fiscal resources to complete the project would result in increased use of renewable energy sources and would outweigh the commitment of resources.

CHAPTER 5 CUMULATIVE IMPACTS OF PROPOSED ACTION

Cumulative impacts are the additive impacts of the Proposed Action on the environment when considered along with other past, present, and future actions, regardless of who takes the action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Actions considered for cumulative impacts of the proposed project are other actions undertaken by the College and other wind energy projects in the area.

The College has completed other renewable energy projects in the past such as a biomass fired heating system, a biomass gasification and cogeneration system and installation of a photovoltaic array on the roof of the main building. These projects combined with the proposed wind energy project will have a positive cumulative impact be decreasing the use of non-renewable fossil fuel. Other future renewable projects planned by the College involved new technologies for the biomass cogeneration system and would be located within existing facilities.

The College maintains a 300 acre campus that includes lawn, fields, gardens, woodland and other natural areas. The College plans to develop a campus wide grounds management program to reduce maintenance costs. An additional benefit of this program is that it would enhance natural areas by reduced mowing and reduction of some areas of managed turf. The program will provide an opportunity to cumulatively improve habitat for grassland bird species which will offset the minor loss of habitat at the project site.

The Proposed Action would generate some noise, which would add to the ambient noise levels in the project area. There are no other known noise generating projects proposed at the College. The ambient noise environment consists of a typical urban/suburban area. As discussed in Section 3.10 the noise levels at Noise Sensitive Areas is expected to be between the noise level of a residential area at night and a quiet business office. The courthouse will have the highest sound levels, with the campus having the next highest sound levels. Both of these locations generally have activities that might be sensitive to noise, take place inside the buildings.

The Proposed Action would affect the viewshed in the project area. The turbine would be the dominant, but not the only, vertical component in the immediate landscape. As discussed in Section 3.8 the turbines will be visible from several locations. Additionally, two shadow flicker receptor locations could potentially experience more than 30 hours of flicker per year.

There would be an unavoidable impact to isolated vegetated wetlands for the construction of the access road as discussed in Section 3.4. The project qualifies for a Section 404 Category 1 Programmatic General permit and the Gardner Conservation

Commission has issued the project an Order of Conditions. Permanent impacts to the isolated wetland will be approximately 2,500 SF. Approximately 2,600 SF of wetland replication is proposed.

The proposed project would likely have a minor impact to birds and bats due to collisions with the turbines as discussed in Sections 3.2 and 3.3. The location of current and proposed wind turbines in the region are provided on the web by the USDOE Wind & Hydropower Technologies Program and the Massachusetts Technology Collaborative, Renewable Energy Trust. Other existing or planned turbines in the area are several miles away and it is unlikely that the proposed project would have a cumulative regionally significant impact on wildlife.

CHAPTER 6 DISTRIBUTION LIST

The U.S. Department of Energy notified federal, state, and local agencies, tribal government representatives (not applicable), elected officials, businesses, organizations, and special interest groups of the Proposed Action. The list of recipients that were notified by postcard of the availability of the Draft EA and attachments is presented below.

Federal

Congressman John W. Olver, 1st District of Massachusetts
U.S. Fish and Wildlife Service, New England Region
Contact: Marvin Moriarty, Regional Director, Northeast Region
Tom Chapman, Supervisor, New England Field Office (NEFO)
Vernon Lang, NEFO
Anthony P. Tur, NEFO
Federal Aviation Administration
Contact: Mike Blaich, OE Airspace Specialist
Contact: Bob Siris, Project Manager, Obstruction Evaluation, NE Region
U.S. Army Corps of Engineers, New England Division
Contact: NEPA Reviewer

State

MA Executive Office of Energy and Environmental Affairs
Contact: Secretary Ian Bowles
MA Historical Commission/SHPO
Contact: Brona Simon, Executive Director, SHPO
MassDOT Aeronautics Division (formerly Massachusetts Aeronautics Commission)
Contact: Lawrence Gallo, Airport Engineering
Denise Garcia, Environmental, NEPA Review
MA DEP Central Region
Contact: Martin Suuberg, Regional Director, and NEPA/MEPA Reviewer
MA Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program
Contact: Thomas French, Assistant Director
Emily Holt Endangered Species Review Assistant
MA Division of Capital Asset Management (DCAM)
Contact: Jenna Ide, Manager, Energy Efficiency and Sustainable Buildings Group
John Crisley, Energy Planner, Energy Efficiency and Sustainable Buildings Group
First District Court of Northern Worcester (Gardner District Court)
Contact: Whitney Brown, Clerk's Office

Regional

Montachusett Regional Planning Commission

Contact: Glenn Eaton, Executive Director

City of Gardner
Mayor Mark P. Hawke
City Council
Contact: City Clerk
Airport Commission
Contact: Ken Bonk, Chairman
Kevin McCole, Airport Manager
Conservation Commission
Contact: Joseph Bishop, Chairman
Board of Health, Health Department
Contact: Dr. Joseph Forte, Chairman, Board of Health
Bernard Sullivan, Director, Health Department
Planning Board
Contact: Allen Gross, Chairman
Community Development and Planning
Contact: Robert Hubbard Director
Levi Heywood Memorial Library
Contact: Gail P. Landy, Director
Gardner Educational Television
Contact: Tim Josti, Jr., Director of Local Programming

Private Organizations and Other Interested Parties
Massachusetts Audubon Society
Contact: E. Heidi Ricci, Senior Environmental Policy Analyst
Jeff Collins, Director Ecological Extension Services
WGAW Talk 1340
Contact: Spencer Marshall, Programming
Heywood Hospital
Contact: Daniel Moen, CEO
Forbush Bird Club
Contact: John C. Root, President
Life Flight, UMASS Memorial
Contact: Mark Restuccia, MD Medical Director
Worcester Telegram and Gazette
Contact: Sandra Bowles, Leominster Office
Gardner News
Contact: Livi Regenbaum, City Editor
Abutters on Green Street, Matthews Street, Kelton Street and Boulder Drive

CHAPTER 7 REFERENCES

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CHAPTER 8 SCOPING PROCESS AND AGENCY CORRESPONDENCE

This chapter contains the following:

1. Notice of Scoping Letter, December 18, 2008
2. Scoping Distribution List
3. Scoping comment letter from Montachusett Regional Planning Commission, January 28, 2009
4. Scoping email from FAA, January 7, 2009
5. Letter sent to MEPA, November 24, 2008
6. Advisory Opinion letter from MEPA, December 1, 2008
7. Early coordination letter from USFWS, March 5, 2008
8. Early coordination Determination from MHC, Feb 26, 2008
9. Concurrence from MHC, June 25, 2009
10. Early coordination letter from NHESP, March 3, 2008

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3305

December 18, 2008

TO: Distribution List

SUBJECT: Notice Of Scoping – Mount Wachusett Community College Wind Energy Project, Gardner, Massachusetts

The U.S. Department of Energy (DOE), in compliance with the National Environmental Policy Act (NEPA) of 1969, plans to prepare an Environmental Assessment (EA) for the proposed Mount Wachusett Community College (MWCC) Wind Energy Project in Gardner, Massachusetts.

Pursuant to the requirements of NEPA, the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021), DOE will prepare a draft EA to:

- Identify environmental effects of implementing the proposed action (construction of up to 2 wind turbines);
- Evaluate viable alternatives to the proposed action, including a no action alternative;
- Describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- Characterize any irreversible and irretrievable commitments of resources that would be involved should this proposed action be implemented.

Pending completion of the EA, DOE proposes to provide Congressionally Directed Federal funding to MWCC for the construction of the wind turbines.

Project Location and Proposed Action

MWCC is located on a 300 acre state-owned site in Gardner, Massachusetts. The College proposes to install and operate up to 2 grid-connected megawatt scale wind turbine electric generators on campus to offset power purchases. The College has developed a renewable energy curriculum and is a recognized leader in the use of clean energy technology. The College has installed a biomass fired heating system, a biomass gasification and cogeneration system, and a photovoltaic array on the roof of the main building.

Federal Recycling Program Printed on Recycled Paper

The proposed location for the wind turbines is the site of the current meteorological test tower, as shown on Figure 1, Project Locus and Figure 2, Project Site. The site would not require significant site preparation or tree clearing. It is close to the primary electric load center for the college, and is at a maximum distance from residential neighborhoods.

The specific turbine model has not been identified but would be up to 2.1 megawatts (MW) each. The types of wind turbines being considered turn at a maximum rate of approximately 32 revolutions per minute. The proposed turbines would be installed on monopole towers with a total height to the top of the blade arc a maximum of 415 feet above ground level (AGL). Final height and blade diameter determination will be made through an evaluation of optimized turbine power output and cost/availability. Power transmission from the turbine site to the interconnection at the main meter room for the campus would be through underground cable. Installation of the cable would consist of trenching within previously disturbed areas such as the open field, the two lane campus access road and lawn areas. A transformer would be installed near the base of the wind turbine. A short, narrow gravel service road, likely along the existing access for the met tower, would be constructed from the nearby campus access road to allow for construction and maintenance.

The project is approximately 3 miles from Gardner Municipal Airport. A Determination of No Hazard to Air Navigation has been issued by FAA for the 415 foot maximum height. The structurse will be lighted in accordance with the FAA Advisory Circular on Obstruction Marking and Lighting.

Development of Reasonable Range Of Alternatives

A range of turbine heights and alternative site locations on the campus have been evaluated that considered cost and environmental impacts. The alternatives will be discussed in the EA along with the No Action alternative. The draft EA will identify the Preferred Alternative.

Probable Environmental Effects/Issues Scoped for the EA

The EA will describe all potential impacts on the environment caused by the project and will identify mitigation measures that will be incorporated into the project design to reduce or eliminate those impacts. An Environmental Overview was completed as part of the Feasibility Study prepared for the project. The following elements of the environment have been identified as potential impact categories:

- Wetland Resources
- Water Quality
- Visual

- Noise
- Electromagnetic Interference (EMI)
- Aviation
- Birds/Bats
- Pedestrian Safety and Risk Assessment

Early coordination has been carried out with the Massachusetts Historical Commission (MHC), the Massachusetts Division of Fisheries & Wildlife, Natural Heritage and Endangered Species Program (MDFW, NHESP), and the US Fish and Wildlife Service (USFWS). In a response to MWCC's Project Notification Form dated February 26, 2008, MHC determined that the project is unlikely to affect significant historic or archaeological resources. A Phase 1 Bat Risk Assessment, an Acoustic Monitoring Program, a Phase 1 Avian Risk Assessment and a Nesting Bird Census have been completed.

Summary of Avian Studies

The project site is located in a currently mowed field on the outskirts of an urban center. Habitat surrounding the 13-acre field includes a small pond and wetland, fragmented secondary woodland, and commercial development (a college campus, parking lots, district court, hospital, golf course, and a highway). Construction of the project will not fragment woodland, and will not impact shrubland, wetland, or other native habitat.

The Nesting Bird Census identified approximately 22 species nesting within the grassy field, forested edge, and wetlands adjacent to the field. The species observed were mostly songbirds of upland fields and forest edges. Raptors and shorebirds such as the American Woodcock or Wilson's Snipe do not nest in the turbine area. Of interest were Bobolink and Willow Flycatcher. No federal or state-listed avian species were observed, nor were they expected according to correspondence from the NHESP and USF&WS.

Nocturnal songbird migration above the project site will be part of a broad-front migration over central Massachusetts. Additionally, the site is located away from the Atlantic coast and other ecological barriers and magnets. A search of studies at many other similar sites in the Eastern U.S. indicates that migration traffic will be low to moderate at the site and most birds will fly well above the rotor-swept area.

Based on the results of the risk assessment, fatality numbers and species impacted at the project site are likely to be similar, on a per turbine per year basis, to those found at Eastern and Midwestern U. S. projects that have been studied. Because there will be only one or two turbines, the absolute numbers of fatalities will in all likelihood be very small and when distributed among several species, are not likely to be biologically significant. When compared with most other wind power facilities, collision risk factors for raptors

are minimal. Collision risk to night-migrating songbirds is likely to be similar to other sites examined because the altitude of migration is generally above the sweep of the wind turbine rotors.

Summary of Bat Studies

A walking survey of the area revealed a low density of appropriately-sized snags that could contain roosting habitat for cavity- and bark-roosting bat species. The southeast corner of the project area did, however, contain some taller snags that would provide suitable roosting habitat. Consultation with state and federal agencies and a review of the literature did not identify the presence of protected species. There appeared to be very little exposed rock habitat that could be used as roost sites by the eastern small-footed Myotis (MA Species of Special Concern). Several small ponds and marshes surrounded the project site and could be used as foraging habitat by local bats.

Preconstruction acoustic monitoring was carried out for the summer and fall season of 2008. Acoustic monitoring will be carried out during the spring 2009 migratory season to document the complete migratory cycle of bats at the project site. Results of the monitoring will be included in the draft EA.

Based on the results of the risk assessment, fatality numbers at the project site are likely to be similar in both composition and magnitude (on a per turbine basis) to other wind projects sites in the eastern United States. Given the small size of the project (1 or 2 turbines), total impact of the project is unlikely to significantly impact local bat populations. There were no data to suggest that protected bat species will be impacted by development of the MWCC project site.

Mitigation

Several mitigation measures will be evaluated in the EA. A grassland management plan will be developed for the project site and other areas of the college to improve avian habitat. The field will not be mowed until after August 1 to protect nesting birds. Brushy areas will not be mowed to provide additional habitat for the Willow Flycatcher. The southeast corner of the project area will not be disturbed to minimize impacts to potential bat roosting habitat.

Post construction studies are proposed as outlined in the Mitigation Overview. Design elements such as underground cable and monopole towers have been incorporated into the project to minimize impacts to avian and bat species.

Public Scoping

The general public and all interested state, local, and federal agencies are invited to participate in the environmental documentation process. Agencies should identify the issues, within their statutory responsibilities, that should be considered in the EA. The general public is also invited to submit comments on the scope of the EA. Please send your comments regarding the scope and content of the EA to:

Jacobs Engineering
343 Congress Street, 2nd FL
Boston, MA 02210
Attn: Maryann Magner
maryann.magner@jacobs.com

DOE will make the Draft EA available for public review and comment when complete. This scoping letter, the Phase 1 Avian Risk Assessment, the Phase 1 Bat Risk Assessment, the Mitigation Overview, the Draft EA (when available), and other relevant documents will be posted on the DOE Golden Field Office electronic reading room at www.eere.energy.gov/golden/reading_room.aspx, under the NEPA Documents section for the course of this project.

Please provide your input regarding the proposed project **on or before January 29, 2009.** Thank you for your participation in the environmental review process.

Sincerely,

Steven P. Blazek
NEPA Compliance Officer
U.S. Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

5

Scoping Distribution List
MWCC Wind Turbine Project

Congressman John W. Olver
1st District of Massachusetts
463 Main Street
Fitchburg, MA 01420

Tom Chapman, Supervisor
USF&WS, NEFO
70 Commercial Street, Suite 300
Concord, NH 03301-5087

Vernon Lang
USF&WS, NEFO
70 Commercial Street, Suite 300
Concord, NH 03301-5087

Mike Blaich
FAA, AJR-322
1701 Columbia Ave.
College Park, GA 30337

Bob Siris, Obstruction Evaluation
FAA, New England Region
12 New England Executive Park
Burlington, MA 01803

NEPA Reviewer, Regulatory Office
US Army Corps of Engineers, NE
696 Virginia Road
Concord, MA 01742-2751

Brona Simon, Ex Director, SHPO
MA Historical Commission/SHPO
220 Morrissey Boulevard
Boston, MA 02125

Lawrence Gallo, Airport Engineering
MA Aeronautical Commission
10 Park Plaza
Boston, MA 02116

Denise Garcia, Environmental
MA Aeronautical Commission
10 Park Plaza
Boston, MA 02116

Martin Suuberg, Regional Director
MA DEP Central Region
627 Main Street
Worcester, MA 01608

Thomas French, Assistant Director
Division of Fisheries and Wildlife
North Drive
Westborough MA 01581

Emily Holt, Reviewer
NNESP (tracking No. 08-24193)
North Drive
Westborough MA 01581

Jenna Ide, Manager, E2SB
MA DCAM
One Ashburton Place
Boston, MA 02108

John Crisley, Energy Planner
MA DCAM
One Ashburton Place
Boston, MA 02108

Whitney Brown, Clerk's Office
Gardner District Court
108 Matthews Street
Gardner, MA 01440-0040

Glenn Eaton, Executive Director
MRPC
R1427 Water Street
Fitchburg, MA 01420

Mayor Mark P. Hawke
City Hall
95 Pleasant Street, RM 125
Gardner, MA 01440

City Council
c/o City Clerk
95 Pleasant Street RM 118
Gardner, MA 01440

Ken Bonk, Chairman
Airport Commission
95 Pleasant Street
Gardner, MA 01440

Kevin McCole, Airport Manager
499 Airport Road
Gardner, MA 01440

Joseph Bishop, Chairman
Conservation Commission
115 Pleasant Street
Gardner, MA 01440

Dr. Joseph Forte, Chairman
Board of Health
95 Pleasant Street
Gardner, MA 01440

Bernard Sullivan, Director
Health Department
95 Pleasant Street
Gardner, MA 01440

Allen Gross, Chairman
Planning Board
115 Pleasant Street
Gardner, MA 01440

Robert Hubbard, Director
Community Development and Planning
115 Pleasant Street
Gardner, MA 01440

Gail P. Landy, Director
Levi Heywood Memorial Library
55 West Lynde Street
Gardner, MA 01440

Tim Josti, Jr, Director
GETV Local Programming
200 Catherine Street
Gardner, MA 01440

E. Heidi Ricci
Mass Audubon Society
208 South Great Road
Lincoln, MA 01773

Jeffrey Collins
Mass Audubon Society
208 South Great Road
Lincoln, MA 01773

Scoping Labels
MWCC Wind Turbine Project
Page 2 of 2

John C. Root, President
Forbush Bird Club
c/o Barton Kamp
43 Zenith Drive
Worcester, MA 01602

Livi Regenbaum, City Editor
The Gardner News Inc.
P.O. Box 340
309 Central Street
Gardner MA 01441-0340

Spencer Marshall, Programming
WGAW Radio
362 Green Street
Gardner, MA 01440

Life Flight, UMASS Memorial
Mark Restuccia, MD, Director
55 Lake Avenue North
Worcester, MA 01655

Secretary Ian Bowles
Executive Office of Energy and
Environmental Affairs
100 Cambridge St, Suite 900
Boston, MA 02114

Daniel Moen, CEO
Heywood Hospital
242 Green Street
Gardner, MA 01440

Sandra Bowles
Worcester Telegram & Gazette
27 Monument Square
Leominster, MA 01453

Marvin Moriarty, Regional Director
USF&WS Regional Office
300 Westgate Center
Hadley, MA 01035-9589

MONTACHUSETT
REGIONAL PLANNING COMMISSION
R1427 Water Street Fitchburg, Massachusetts 01420
(978) 345-7376 FAX (978) 348-2490 Email: mrpc@mrpc.org

January 28, 2009

Jacobs Engineering
343 Congress Street, 2nd FL
Boston, MA 02210
Attn: Maryann Magner

Dear Ms. Magner:

At the Montachusett Regional Planning Commission (MRPC) meeting held on January 27th, 2009, Commission Members reviewed and discussed the Notice of Scoping for the Mount Wachusett Community College (MWCC) Wind Energy Project located in Gardner, Massachusetts. The U.S. Department of Energy (DOE) plans to prepare an Environmental Assessment for this project.

MWCC is located on a 300 acre state-owned site in Gardner, MA. The College proposes to install and operate up to 2 grid-connected megawatt scale wind turbine electric generators on campus to offset power purchases. The College has developed a renewable energy curriculum and is a recognized leader in the use of clean energy technology. The College has installed a biomass fired heating system, a biomass gasification and cogeneration system, and a photovoltaic array on the roof of the main building. After reviewing the documents made available under by DOE, the project as proposed in the scope will have minimal environmental effects.

MRPC Commission Members found this proposal in conformity with regional goals, policies and objectives subject to local approval from the City of Gardner. The project meets MRPC goals of Environmental Quality, Individual Opportunity and Welfare, Economic Development, and Energy. The Commission recommends the Mount Wachusett Community College to continue to work with the U.S. Department of Energy (DOE) and the City of Gardner to bring this project to fruition.

Sincerely,

Glenn Eaton
Executive Director

Cc: Robert Rizzo, Director of Sustainability and Energy Policy, MWCC

Magner, Maryann

From: Mike.Blaich@faa.gov
Sent: Wednesday, January 07, 2009 7:40 AM
To: Magner, Maryann; maryann.magner@iacobs.com
Cc: Allen.M.Lucas@faa.gov
Subject: Environmental Assessment of wind energy project in Gardner, MA

Hi Maryann,

I received a postcard showing "Notice of Scoping" and a request from the US Dept of Energy (DOE) to get public input on the scope of environmental issues and alternatives, for a wind energy project at the Mount Wachusett Community College in Gardner, MA. If their structure(s) meet FAA Filing Notice Criteria, then they must submit an aeronautical study(ies) on-line at our Public Web Site, written below my name. The FAA Filing Notice Criteria is explained on the Home Page of this web site. If an aeronautical study is required, then I will be the one to write them a determination. For any environmental issues, please contact Allen Lucas for his input, if needed.

Thanks,

Mike Blaich
OE Airspace Specialist -Wind Turbines East (WTE)
Tel: 770-909-4329
Fax: 770-909-4325
Email: mike.blaich@faa.gov
Public Web Site for filing/status checks: www.oeaaa.faa.gov

1

JACOBS

343 Congress Street
Boston, Massachusetts 02210 USA
1.617.242.9222 Fax 1.617.242.9824

November 24, 2008

Secretary Ian A. Bowles
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn: Richard Bourré

Subject: Request for Advisory Opinion
Wind Energy Project
Mount Wachusett Community College
Gardner, Massachusetts

Dear Secretary Bowles:

As the consultant to Mount Wachusett Community College (MWCC) for the above referenced project, we are writing to request confirmation in writing that MEPA review is not required for the project.

The project involves state action but does not meet or exceed any of the MEPA review thresholds as discussed below. The project will seek state funding for a portion of the cost of construction. The Massachusetts Aeronautical Commission (MAC) will issue an Airspace Review determination. The Gardner Conservation Commission will review the project pursuant to the Massachusetts Wetlands Protection Act and the Gardner Wetland Ordinance.

The project will also receive U.S. Department of Energy (DOE) funding for part of the cost of construction. The project will be the subject of an Environmental Assessment (EA) pursuant to DOE implementing procedures for compliance with NEPA. DOE has requested confirmation in writing that the project does not require review under MEPA.

Project Location and Proposed Action

MWCC is located on a 300 acre state-owned site in Gardner, Massachusetts. The College proposes to install and operate one or two grid connected megawatt scale wind turbine electric generators on campus to offset power purchases. The College has developed a renewable energy curriculum and is a recognized leader in the use of clean energy technology. The College has installed a biomass fired heating system, a biomass gasification and cogeneration system, and a photovoltaic array on the roof of the main building.

The proposed location for the wind turbines is the site of the current meteorological test tower, as shown on Figure 1, Project Locus. The site would not require significant site preparation or land disturbance. It is close to the primary electric load center for the College, and is at a maximum distance from residential neighborhoods.

The specific turbine model has not been identified but would be up to 2.1 megawatts (MW) each. The types of wind turbines being considered turn at a maximum rate of approximately 32 revolutions per minute. The proposed turbines would be installed on monopole towers with a total height to the top of the blade arc at a maximum of 415 feet above ground level (AGL). Final height and blade diameter determination will be made through an evaluation of optimized turbine power output and cost/availability. Power transmission from the turbine site to the interconnection at the main meter room for the campus would be through underground cable. Installation of the cable would consist of trenching within previously disturbed areas such as the open field, the two lane campus access road and lawn areas. A transformer would be installed near the base of the wind turbine. A short, narrow gravel service road would be constructed from the nearby campus access road to allow for construction and maintenance.

The project is approximately 3 miles from Gardner Municipal Airport. A Determination of No Hazard to Air Navigation has been issued by FAA for the 415 foot maximum height. The structure will be lighted in accordance with the FAA Advisory Circular on Obstruction Marking and Lighting.

MEPA Thresholds

Land: NA. The project site is within an existing mowed field. Land disturbance will be limited to the tower footing, installation of an underground cable connection and a small gravel service road. Direct alteration of land is estimated at approximately 1-2 acres. The project does not involve the creation of impervious area, except for the tower footing.

Rare Species: NA. State and federal listed species do not occur at the site. The letter from NHESP, dated March 3, 2008 is attached. Phase 1 risk assessments have been completed for avian and bat species and will be included in the NEPA EA document.

Wetlands: NA. The project will not impact Bordering Vegetated Wetlands. The project will be within the riverfront of a perennial stream and the buffer zone for a small pond and associated BVW. A small area of isolated vegetated wetland that is subject to federal and city jurisdiction may be impacted. A Notice of Intent will be submitted to the Gardner Conservation Commission, if required.

Water: NA. The project does not have any elements that apply to this category.

Wastewater: NA. The project does not have any elements that apply to this category.

Transportation: NA. A gravel access road will be constructed off an internal campus access road. The project is not a transportation project.

Energy: NA. The project consists of construction of 1 to 2 turbines with a capacity of up to 2.1 MW each, for a total of less than 5 MW.

Air: NA. The project does not have any elements that apply to this category.

Solid/Hazardous Waste: NA. The project does not have any elements that apply to this category.

Historic and Archaeological Resources: NA. The Massachusetts Historical Commission (MHC) has been consulted. The project is not expected to affect historic or archaeological resources. See attached MHC Determination dated February 26, 2008.

Areas of Critical Environmental Concern (ACEC): NA. The MassGIS database has been consulted. The project area is not within an ACEC.

Regulations: NA. The project does not have any elements that apply to this category.

Thank you for your attention to this matter. If you have any questions or need additional information please contact me at 617-242-9222 or by email: maryann.magner@jacobs.com

Sincerely,

Maryann T. Magner

Maryann T. Magner
Senior Environmental Planner

Enclosures: Figure 1, USGS Project Locus
Letter from NHESP, dated March 3, 2008
Determination from MHC, dated February 26, 2008

cc: Edward Terceiro, Executive Vice President, Mount Wachusett Community College
Rob Rizzo, Director of Sustainability & Energy Policy, Mount Wachusett Community College
DOE NEPA file

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

December 1, 2008

Maryann Magner
Jacobs Engineering Group, Inc.
343 Congress Street
Boston, MA 02210

Re: Request for Advisory Opinion
Wind Energy Project - Mount Wachusett Community College - Gardner

Dear Ms. Magner:

I am writing in response to your letter of November 24, 2008, in which you requested a determination as to whether review under the Massachusetts Environmental Policy Act (MEPA), M.G.L. c. 30, §§61-62I, would be required for the project referenced above.

According to your letter, Mount Wachusett Community College is proposing to install and operate one or two grid-connected wind turbine electric generators (up to 2.1 megawatt (MWs) each) on its 300-acre campus in Gardner to offset power purchases. It is anticipated that approximately one to two acres of new impervious surfaces would be created to install the wind turbines. In your letter, you also stated that the project would not exceed any MEPA review thresholds.

Based on the information you provided, I concur that, notwithstanding the fact that the project is being undertaken by an Agency of the Commonwealth, it does not exceed any MEPA review thresholds. Therefore, I find that the project is not subject to review under MEPA and the submission of an Environmental Notification Form (ENF) is not required.

M. Magner Advisory Opinion 12/1/08

Pease contact Rick Bourré, Assistant Director of the MEPA Office, at (617) 626-1130 if you have any questions concerning this matter.

Sincerely,

Alicia McDevitt
Assistant Secretary

ABM/RAB/rab

2

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/northeast/newenglandfieldoffice

March 5, 2008

Reference:	Project	Location
	Wind turbines	Gardner, MA

Maryann Magner
Jacobs Edwards and Kelcey
343 Congress St.
Boston, MA 02210

Dear Ms. Magner:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed project referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Operation of wind turbines can adversely affect a variety of wildlife species, including migratory birds and bats. In order to assess the level of risk and the scope of species potentially present in a wind turbine project area, this office recommends that 1) the spatial and temporal uses of the rotor-swept zone by wildlife be identified and evaluated using radar and other remote sensing techniques for a period of three years, and 2) the local site environs be evaluated to determine the presence and magnitude of habitat fragmentation syndrome of effects that would be implicated by project construction and/ or operation. These effects may include the direct loss of habitat; an increase in edge habitat; increased nest parasitism and predation; increased isolation of remaining forest; a decrease in abundance and diversity of area-sensitive species; a decrease in size of remaining forest patches; increased human disturbance; a decrease in habitat suitability for area-sensitive species and a concurrent increase in habitat suitability for edge or generalist species; and interruption of travel corridors, displacement and other behavioral effects.

- 2 -

We recommend that the above pre-construction surveys be conducted to inform the project proponent, as well as the Service, of potential wildlife conflicts during the site selection and planning stages. With this information, risks can be assessed, and methods to avoid, minimize and mitigate impacts to wildlife may be accommodated. Without these pre-construction surveys, operational disruptions could reduce the benefits of this important alternative energy source while attempting to avoid impacts to wildlife. Absent adequate pre-construction surveys and careful analysis of subsequent data, the siting, construction and operation of a wind project that results in mortality to wildlife would likely result in violation of federal laws, such as the Migratory Bird Treaty Act and the Endangered Species Act.

Thank you for your coordination. Please visit the Wind Energy page on the New England Field Office's website for useful links, including guidance documents for avoiding and minimizing impacts to wildlife (http://www.fws.gov/northeast/newenglandfieldoffice/FedActivities-WindEnergyProj.htm). Please contact Vernon Lang or myself at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Anthony P. Tur
Endangered Species Specialist
New England Field Office

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950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

After review of MHC files and the materia you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

Walter L. Maros
Preservation Planner
Massachusetts Historical Commission
2/26/08
Date

PROJECT NOTIFICATION FORM

Project Name: Wind Turbine Project

Location / Address: Mount Wachusett Community College

City / Town: Gardner

Project Proponent

Name: Mt Wachusett Community College, Robert Rizzo, Director, Facilities Admistration

Address: 444 Green St, Gardner

City/Town/Zip/Telephone: Gardner, MA 01440, 978-632-6600

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
DOE	Grant
Massachusetts	Possible Funding
GardnerCon Comm	Order of Conditions for Buffer Zone work

Project Description (narrative):

Construction of up to two wind turbines on monopole towers.
Please see attached Project Narrative

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

The existing met tower will be removed.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

No.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Yes. Up to two wind turbines on monopole towers will be constructed.

5/31/96 (Effective 7/1/93) - corrected

950 CMR - 275

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

No.

What is the total acreage of the project area?

Woodland	acres	Productive Resources:	
Wetland	acres	Agriculture	acres
Floodplain	acres	Forestry	acres
Open space 2	acres	Mining/Extraction	acres
Developed	acres	Total Project Acreage 2	acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area? Footings for two monopole towers

Site of existing meteorological test tower in open field.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: Maryann T. Magner Date: 1-31-08

Name: Maryann. Magner, Senior Environmental Planner

Address: Jacobs Edwards and Kelcey, 343 Congress Street

City/Town/Zip: Boston, MA 02210

Telephone: 617-242-9222

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

7/1/93

950 CMR - 276

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

RECEIVED
JUN 12 2009
MASS. HIST. COMM

June 8, 2009

043683

Brona Simon
Executive Director
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

CONCURRENCE: Brona Simon
BRONA SIMON
STATE HISTORIC
PRESERVATION OFFICER
MASSACHUSETTS
HISTORICAL COMMISSION
6/25/09

Dear Ms. Simon:

Subject: Section 106 Consultation
Mount Wachusett Community College's Wind Turbine Project

By this letter, the U.S. Department of Energy (DOE) is consulting with you, in your official SHPO capacity, regarding Section 106 compliance with the National Historic Preservation Act (NHPA) for the Mount Wachusett Community College (MWCC) Wind Turbine Project.

Previously, the consultant for MWCC submitted to your office a Project Notification Form (PNF) as part of the Feasibility Study for the project. At that time your office determined that the project is unlikely to affect significant historic or archaeological resources (2/26/08). This letter transmits an updated PNF for your review.

MWCC proposes to construct up to two wind turbines on campus. Construction would take place on campus-owned lands, within areas previously disturbed for the construction of the college and the adjacent district court house. The DOE Proposed Action would provide Congressionally Directed Federal funding to MWCC for a portion of the cost of construction of the wind turbines.

DOE is preparing a Draft Environmental Assessment (DEA) for the project. You will be given the opportunity to review and comment on the Draft Environmental Assessment when it is available.

Mount Wachusett Community College proposes to install and operate one to two grid-connected megawatt scale wind turbine electric generators on its main campus to offset power purchases. The proposed location for the wind turbines is at 444 Green Street in the City of Gardner, Worcester County, Massachusetts, as shown on Figure 1, USGS Project Locus, Figure 2, Project Site, and Figure 3, Site Base Plan. The existing 50 meter meteorological test tower, which will be removed, is currently located at the site. Two turbines are proposed as shown on the figures. The project site would be approximately 3 acres. A gravel service road would be constructed for construction and maintenance.

The specific turbine model has not been identified but would be up to 2.0 megawatts (MW) each. The proposed turbines would be installed on monopole towers with a total height to the top of the blade arc a maximum of 415 feet above ground level (AGL). Power transmission from the turbine site to the interconnection at the main meter room for the campus would be through underground cable.

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If you agree with DOE's assessment that there will be no affect to historic or archaeological resources, please concur, as your concurrence is required for DOE's record of compliance under Section 106.

Please contact Laura Margason at 720-356-1322 with any questions regarding this consultation.

Sincerely,

Steve Blazek
NEPA Compliance Officer

Enclosures: Figures 1, 2, & 3
Updated PNF, dated May 27, 2009

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

3/3/2008

Maryann Magner
Jacobs Edwards and Kelcey
343 Congress St
Boston MA 02210

RE: Project Location: Mt Wachusett Community College
Town: GARDNER
NHESP Tracking No.: 08-24193

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-listed rare species in the vicinity of the above referenced site.

Based on the information provided, the NHESP has determined that at this time the site is not mapped as Priority or Estimated Habitat and the NHESP database does not contain any state-listed species records in the immediate vicinity of this site. However, we recommend that potential impacts to birds be considered during the design and permitting process for all wind turbines.

This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. If you have any questions regarding this letter please contact Emily Holt, Endangered Species Review Assistant, at (508) 389-6361.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

www.masswildlife.org

Division of Fisheries and Wildlife
Field Headquarters, North Drive, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7891
An Agency of the Department of Fish and Game