

STATE OF MAINE
LAND USE REGULATION COMMISSION

IN THE MATTER OF DEVELOPMENT)	Pre-Filed Direct Testimony of
APPLICATION DP 4889)	Patrick Graham, Janine Murchison, and
CHAMPLAIN WIND, LLC)	Jodi O’Neal on behalf of
BOWERS WIND PROJECT)	Champlain Wind, LLC

On behalf of Champlain Wind, LLC (“Champlain”), Patrick Graham, Janine Murchison, and Jodi O’Neal are submitting this pre-filed direct testimony in support of DP 4889 for the Bowers Wind Project.

I. QUALIFICATIONS AND BACKGROUND

A. Patrick Graham

I am employed by James W. Sewall Company (Sewall) of Old Town as Director of Renewable Energy Services and am a Licensed Professional Engineer in the States of Maine, Georgia and South Carolina. I have worked for Sewall since 2006. I am responsible for the management, scheduling, and overall design and quality of civil/environmental engineering, aerial mapping and GIS development projects within the renewable energy market for Sewall. I graduated from the University of North Carolina at Chapel Hill with a BSPH in Environmental Science and Engineering in 1992 and the Georgia Institute of Technology with a MS in Environmental Engineering in 1997. During my employment at Sewall, I have worked on the civil engineering design of several wind projects within the State of Maine including the Stetson Mountain Wind Project, Stetson II Wind Project, Kibby Wind Project, Record Hill Wind Project, and the Rollins Wind Project. Our work on these wind projects included the layout and design of the access roads, crane paths, and turbine pads, and also included aerial mapping and parcel mapping support. Prior to my employment at Sewall, I worked as an environmental engineer

and project manager for engineering consulting firms in the state of Georgia from 1997 to 2006. My resume is attached as Exhibit A.

B. Janine Murchison

I am employed by James W. Sewall Company (Sewall) as a Project Engineer/Project Manager and am a Licensed Professional Engineer in the State of Maine. I have worked for Sewall since 2007. I am responsible for the management and design of civil engineering projects being worked on in the Caribou office supported by the Old Town office. I graduated from the University of Maine with a B.S. Degree in Civil Engineering in 1986. During my employment at Sewall, I have worked on civil and site design projects for municipal and private clients including resort development roadway and site design as well as downtown pedestrian and parking lot improvements design; additionally I worked on the access road, crane path, and turbine pad design for the Stetson II Wind Project. Prior to my employment at Sewall, I worked as a civil engineer at the following locations: Dufresne-Henry/Stantec 2001 to 2007; County Environmental Engineering 1998 to 2000; Aroostook Engineers 1986 to 1997. My resume is attached as Exhibit B.

C. Jodi O'Neal

I am employed by James W. Sewall Company (Sewall) as a Staff Engineer and I am Certified as an Engineer-Intern in the State of Maine. I am also a Certified Professional in Erosion and Sediment Control. I have worked for Sewall since 2007. I graduated from the University of Maine with a B.S. Degree in Civil Engineering in 2002. Prior to working for Sewall, I was employed by Plymouth Engineering from 2002 to 2007. The majority of my experience involves development of site designs and the preparation of hydraulic and drainage calculations and analysis for large land development projects. This work is typically utilized for

permitting of large projects and the development of design measures to control the quantity and quality of storm water runoff from developed sites. My resume is attached as Exhibit C.

D. Company Qualifications and Background

James W. Sewall Company (Sewall) is a full-service consulting firm based in Old Town, Maine. The company offers a multidisciplinary array of services, including engineering, surveying, construction management, land use planning, Geographic Information Systems (GIS) consulting, aerial mapping and photogrammetry, and forest resource consulting. The Engineering, Surveying, and Utilities (ESU) Division includes professional engineers, professional land surveyors, GIS analysts, and technicians with expertise in virtually every discipline of civil engineering, including site design and permitting, structural, hydraulic, environmental, geotechnical, and transportation engineering.

Sewall has 150 employees and eight corporate offices in six states: Alabama, Minnesota, New York (two offices), North Carolina, South Carolina, and two offices in Maine. Sewall has built its business over the years by establishing collaborative long-term partnerships with its clients. Sewall consultants assist public and private sector clients throughout the United States, Canada, and overseas with projects that range in size and scope from municipal subdivision peer reviews to massive multi-year geocoding contracts in major metropolitan areas.

To date, Sewall professionals have provided permit-level and construction design services on ten commercial-scale wind energy projects in New England, including nine projects in Maine. These projects represent 299 wind turbine generators, 135 miles of access roads, and over 600 MW of potential power production. Attached as Exhibit D is a chart identifying the wind power projects in Maine for which Sewall has either provided permit-level or construction design services, and the key characteristics of each project. Although wind power construction

was new in Maine beginning with the Mars Hill project in 2006, there is now substantial wind power construction experience in Maine. In close coordination with the State review agencies, construction techniques have been developed and implemented in a manner that successfully maintains the groundwater hydrology, minimizes soil erosion and sedimentation, and accommodates the specific needs of wind power projects. These techniques have been incorporated into the design drawings for this project.

II. INVOLVEMENT WITH THE BOWERS WIND PROJECT

The James Sewall Company (Sewall) has provided the civil engineering design for the layout of the access roads, crane paths, turbine pads, and operation and maintenance building for the Bowers Wind Project. During the design of the project, efforts were made to utilize, to the extent practicable, the existing network of forestry roads to access the turbine pads and minimize the amount of new roadways and land disturbance necessary for the project. We have completed the drainage analysis within the project area to properly size drainage structures as well as develop stormwater quantity and quality control measures to address runoff from the site. The stormwater erosion and sediment control measures included within the permitting plans for this project were developed in cooperation with input from professionals at the Department of Environmental Protection (DEP), Land Use Regulation Commission (LURC) and the State of Maine Soil Scientist.

The purpose of this testimony is to briefly explain the process and the design criteria utilized for the development of the access roads, crane paths, and the turbine pads for the Bowers Wind Project. The civil design plans for the Project are included as Exhibit 1A of the Application. Of primary concern with the development of any of these types of projects is to minimize the overall disturbance of the project area, avoid natural resources, and utilize existing

roadways whenever possible. This task must be balanced with development of access roads and crane paths that are suitable for the transport and installation of the large components that are required for wind energy projects. Minimum roadway widths, grades, and curvature all play an important role in the proper layout of wind projects. Turbine pads must be developed that not only provide room for the permanent installation and maintenance of the wind turbines, but also allow room for the positioning of large equipment and components necessary to assemble the turbines. In addition, balancing grades of the access roads, crane paths, and turbine pads such that large quantities of roadway materials do not need to be brought in from offsite or removed from the site also needs to be considered to balance project costs and practical construction methodologies.

The Bowers Mountain Project includes 27 Turbines: up to 10 of the turbines may be Siemens 3.0 MW turbines, and the balance will be Siemens 2.3 MW turbines. The roadway and crane path geometry used for this project was based on recommendations from Siemens, the applicant's experience with other wind projects, and input from the site contractor, Reed & Reed. The design includes 20-foot wide access roads and 35-foot wide crane paths. The minimum curvature for centerline horizontal alignments used for access roads and crane paths was 150 feet. The maximum longitudinal slope along access roads and crane paths was twelve percent (12%) and the maximum cross slope grade used was two percent (2%). The typical size of the turbine pad was 334 feet in diameter with an approximate cross slope of one to two percent (1-2%). Avoidance of impacts to natural resources such as existing wetlands and vernal pools was a key design criteria for determining the location of the proposed access roads, crane paths, and crane pads.

A hydraulics and drainage analysis was completed for this project for pre-development and post-development conditions for the site. The purpose of this analysis was to properly size drainage structures, design temporary and permanent erosion control and water quality measures, to demonstrate that there will not be any adverse effects downstream of the project, and to insure that the proposed design for the facility is in accordance with State and Federal regulations.

The drainage analysis was completed using the 2, 10, and 25-year Type III 24 hour design storms. All drainage structures were sized to accommodate the 25-year storm.

Watershed areas used in our analysis are based on subwatershed level boundaries from the US Environmental Protection Agency Office of Water watershed boundary dataset available through the Maine Office of GIS. The hydrologic soils properties within the project area were provided from soils analysis completed by Albert Frick Associates, Inc.

Sewall worked closely with DEP and Dave Rocque, the State soil scientist, to ensure that the stormwater management and the erosion and sedimentation control measures are appropriate for the type of development and existing conditions. For example, a number of construction techniques have been developed in prior wind projects in Maine and used successfully during construction to ensure that groundwater hydrology is maintained and erosion during construction is minimized. These measures are reflected in the site-specific erosion and sedimentation control plan (the “E&S Plan”), which is included as Exhibit 10A of the Application. Additionally, the full stormwater analysis is included in Section 10.0 and Exhibit 10B of the Application.

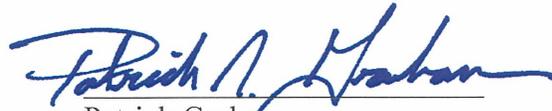
The project was designed to meet the State’s water quality standards based on the existing and proposed development within the watersheds. The State erosion and sedimentation control standards were met using a variety of DEP-approved best management practices (BMPs) including silt fence, bark mulch berms, level lip spreaders, rock sandwiches, and vegetated

buffers. The entire project lies within lake watersheds, all of which require phosphorous calculations to be completed. Appropriate treatment measures were taken to mitigate phosphorus runoff from the project and protect these lakes. Phosphorous treatment measures utilized for this project include designating vegetated buffer areas within the project boundary to be maintained with limited disturbance for the life of the project.

III. CONCLUSION

Sewall believes that we have provided a design for the access roads, crane paths, turbine pads, and O&M building that minimizes impacts to the surrounding landscape and natural resources while providing an efficient and practical roadway network for component delivery and installation at the Bowers Mountain Wind Farm. Our design takes advantage of the existing forestry roads as much as practicable to access the site. We have included within our design BMPs approved by DEP and LURC to treat stormwater runoff from the site.

Date: 9 June 2011


Patrick Graham

STATE OF MAINE
County of Penobscot

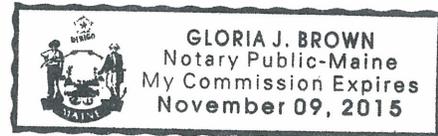
Date: June 9, 2011

Personally appeared before me the above named Patrick Graham, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,


Notary Public

My commission expires: 11-9-11



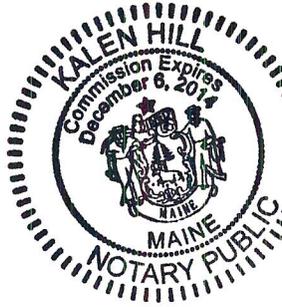
Date: 06/09/11

Janine Murchison
Janine Murchison

STATE OF MAINE
County of Aroostook

Date: 6-9-2011

Personally appeared before me the above named Janine Murchison, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of her knowledge and belief.



Before me,

Kalen Hill

Notary Public

My commission expires: 12-6-2014

Date: 6/9/2011

Jodi O'Neal
Jodi O'Neal

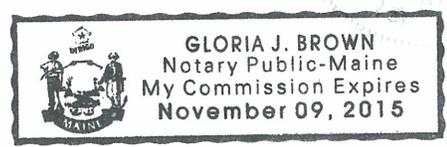
STATE OF MAINE
County of Penobscot

Date: June 9, 2011

Personally appeared before me the above named Jodi O'Neal, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of her knowledge and belief.

Before me,

Gloria J. Brown
Notary Public
My commission expires: 11-9-15



Graham, Murchison, and O'Neal Pre-Filed Direct Testimony Exhibits

Exhibit A: Graham Resume

Exhibit B: Murchison resume

Exhibit C: O'Neal Resume

Exhibit D: Sewall Chart on Wind Power Projects

Patrick N. Graham, P.E.

Director of Renewable Energy Services

Engineering, Survey & Utilities Division

Mr. Graham joined the James W. Sewall Company in 2006 and has over 18 years of experience in civil and environmental engineering as it relates to site development & permitting, water resources management, wastewater collection & treatment, soil and water quality, and human health risk assessment. His areas of specialization include civil site design, environmental permitting, environmental site assessments, environmental site and field investigations, environmental remediation, stormwater management, and municipal utility GIS development. He currently serves as Sewall's Director of Renewable Energy Services and Market Lead for wind energy project development.

EDUCATION

B.S.P.H., Environmental Science and Engineering, University of North Carolina at Chapel Hill, 1992

M.S., Environmental Engineering, Georgia Institute of Technology, 1997

PROFESSIONAL LICENSES AND AFFILIATIONS

Licensed Professional Engineer, Maine #11236

Registered Professional Engineer, Georgia #26690

Licensed Professional Engineer, South Carolina #24401

RELEVANT EXPERIENCE

Senior Project Manager

Stetson Mountain Wind Project, Washington County, Maine. Responsible for aerial mapping of 45-mile transmission line corridor and civil road and site design for 57MW wind farm including 38 GE 1.5MW wind turbine generators. Civil design included turbine micrositing, roadway plan and profile, stormwater management facilities and erosion & sedimentation control plans. Assisted project team with rezoning and site development permitting submittals to the Maine Land Use Regulation Commission.

Stetson II Wind Project, Washington County, Maine. Responsible for civil road and site design for 25MW wind farm including 17 GE 1.5MW wind turbine generators. Design included turbine micrositing, roadway plan and profile, stormwater management facilities and erosion & sedimentation control plans. Assisted project team with site development permit submittal to the Maine Land Use Regulation Commission.

Sheffield Wind Project, Sheffield, Vermont. Responsible for final civil road and site design for proposed 40MW wind farm including 16 Clipper 2.5MW wind turbine generators. Design included turbine micrositing, roadway plan and profile, stormwater management facilities and erosion & sedimentation control plans. Assisted project team with construction and operational stormwater permit submittals to the Vermont Department of Environmental Conservation.

Kibby Wind Power Project, Kibby & Skinner Townships, Maine. Senior consultant to Sewall Project Team for civil road and site redesign for proposed 132MW wind farm including 44 Vestas V90 3.0MW wind turbine generators. Responsible for review of project design plans and Maine Land Use Regulation Commission permitting submittals.



Record Hill Wind Project, Roxbury, Maine. Senior consultant to Sewall Project Team for civil road and site redesign for proposed 50.6MW wind farm including 22 Siemens 2.3MW wind turbine generators. Responsible for review of project design plans and Maine Department of Environmental Protection site permitting submittals.

Rollins Wind Project, Lincoln/Lee, Maine. Senior consultant to Sewall Project Team for parcel mapping and civil road and site redesign for proposed 60MW wind farm including 40 GE 1.5MW wind turbine generators. Responsible for review of project design plans and Maine Department of Environmental Protection site permitting submittals.

Bowers Wind Project, Carroll Plantation, Maine. Responsible for aerial mapping of ridgelines and transmission line corridor for proposed 57MW wind project in Penobscot County and Washington County. Senior Project Manager responsible for design included turbine micrositing, roadway plan and profile, stormwater management facilities and erosion & sedimentation control plans, as well as parcel mapping, dwelling survey, ALTA survey, and transportation route study. Assisting project team with site development permit submittal to the Maine Land Use Regulation Commission.

DeepCwind Offshore Wind Project, Monhegan Island, Maine. Project Director for environmental permitting of the first proposed floating offshore wind research project in North America. The project is being developed by a consortium of academia and industry partners led by the University of Maine and will be sited approximately 2.5 nautical miles south of Monhegan Island in the Gulf of Maine. The first one-third scale floating offshore wind turbine and platform is proposed to be installed in Summer 2012. Responsible for directing environmental permitting team, development of state and federal permit applications, and project mapping and GIS support.

Offshore Wind Energy Geographic Information System (OWEGIS), Gulf of Maine. Responsible for data development and geodatabase population for offshore wind energy GIS development project with the University of Maine. Collaborated with University researchers to create comprehensive overlapping multi-faceted GIS consisting of over 450 data layers accessed through an ArcMap interface that have been derived from public and private sources, including traditional GIS data, discrete observational data, geospatial data extracted from scientific and government literature resources, and value-added data. The system included physical characteristics, economic, cultural, environmental, infrastructure and legal boundary data. OWEGIS was created with the intent to collect, analyze, and display geospatial information to assist in planning, permitting, and the development of offshore wind energy in the Gulf of Maine.

Fatal Flaw Analyses, Various Potential Wind Project Sites, Mid-Atlantic United States. Senior consultant for Sewall Project Team for conducting GIS-based fatal flaw analyses for numerous prospective wind project development sites across the mid-Atlantic area of the eastern United States. Analysis included development of cadastral mapping, aerial orthophotography image analysis, and GIS data compilation. Fatal flaw analyses were designed to display and analyze geospatial information to assist in planning, permitting, and development of commercial-scale land-based wind energy projects. Responsible for development of fatal flaw process and review of final reports.

Janine S. Murchison, P.E.

Project Manager, Engineering & Survey Division

Ms. Murchison joined James W. Sewall Company in 2007 with over 20 years of experience in the civil engineering field. Ms. Murchison has managed, designed, and monitored construction activities on a wide variety of projects including roadway, storm drain, water, and sewer systems. She also has practical experience with downtown revitalizations, airport improvements, pedestrian trails, landfill closures, boat landings, parking lots, site design, environmental permitting, and all aspects of construction services.

EDUCATION

B.S., Civil Engineering, University of Maine, 1986

M.S., Business, Husson College, Caribou, Maine 1995

PROFESSIONAL CERTIFICATIONS AND AFFILIATES

Registered Professional Engineer, Maine #7125

Trustee, Caribou Public Library

Trustee, Caribou Utilities District

RELEVANT EXPERIENCE

Bowers Mountain Wind Project, Penobscot and Washington Counties, Maine. Currently managing the civil design for a proposed wind farm including up to 10 Siemens 3.0 MW wind turbine generators and up to 17 Siemens 2.3 MW wind turbine generators. Design includes turbine micro-siting, site layout, roadway plan and profile, stormwater management and erosion & sedimentation control plans. Assisting project team with civil site narratives and drawings for development permit submittal to the Maine Land Use Regulation Commission.

Stetson II Wind Project, Washington County, Maine. Managed and prepared civil design for a 25MW wind farm including 17 GE 1.5MW wind turbine generators. Design included site layout, roadway plan and profile, stormwater management and erosion & sedimentation control plans. Assisted project team with civil site narratives and drawings for successful application of the Development Permit submission to the Maine Land Use Regulation Commission. Additionally, managed and prepared final design drawings and specifications for bidding and construction phases.

Twin Pine Camps, LLC Expansion Project, T1 R8 WELS, Maine: Managed and prepared successful application for an Amendment to Development Permit per Maine Land Use Regulation Commission (LURC) requirements. Assisted with site design of roads, driveways, and parking lots for the addition of nine (9) transient Cove Cabins and a library/sauna building. Coordinated the efforts of the owner, environmental, and architectural team members.

KTAADN Resorts, T1 R8 WELS, Maine: Currently in the final stages of managing and preparing a Development Permit application per Maine Land Use Regulation Commission (LURC) requirements for the 'Adventure Lodge' portion of the resort. Managed the site design development of the proposed access roads, the proposed Lodge, a hotel/restaurant/conference center, in addition to the proposed 21 transient Family Cabins adjacent to the Lodge. Coordinated the efforts of the owner, environmental, and architectural team members.

Downtown Master Plan, Presque Isle, Maine: Managed and prepared a 20-year master plan, with 5-year implementation strategies for the downtown's focus area. Conducted a downtown workshop to discuss strategies and priorities; managed land use analysis, branding recommendations, funding option recommendations, and conceptual designs;

prepared transportation and parking analysis; updated goals, strategies, and action plans and broke information down based on the four-point approach for downtown development: organization, economic restructuring, design, and promotion. Presented the final report and design concepts at separate meetings with the downtown committee, the city council, and the planning board. Coordinated the efforts of the city and the downtown committee as well as the landscape architect and urban planner team members.

Prior to joining James W. Sewall Company, Ms. Murchison worked on numerous projects, primarily in the northern Maine area; several of which are outlined below:

Maysville Street Extension and Reconstruction Project; Presque Isle, Maine: Assisted with the preparation of a Site Location application; designed roadway, storm drain and sewer collection systems; managed concrete bridge, landscape, traffic and lighting design; managed construction monitors and provided construction services for one mile stretch of road adjacent to and in conjunction with the Aroostook Centre Mall. Also coordinated the work between engineering subconsultants, financially interested parties, and the Maine Department of Transportation (MDOT).

Big Rock Ski Area; Mars Hill, Maine: Assisted with the preparation of a site location application for proposed improvements to include additional ski trail development, additional ski lift sites, base area building construction and renovations, and parking area expansions; managed design improvements to ski trail lighting system. Also prepared a Spill Prevention, Control, and Countermeasure (SPCC) Plan for the facility.

Allagash Road Reconstruction Project; Dickey, Maine: Designed and monitored the reconstruction of a portion of the Allagash Road (Rapid Road) between the Little Black River Bridge and the St. John River Bridge as a result of previous flooding. This project involved coordination with MDOT as both the Little Black River and St. John River Bridges were being reconstructed simultaneously with this project. The Maine DEP and the Army Corps of Engineers were also involved due to the road's proximity to the rivers and correlated flood plain wetland issues.

Presque Isle Boat Landing; Maine: Designed access road and boat launch on the Aroostook River; project included concrete launch planking, paved parking lot and access road; provided construction monitoring and construction services. Environmental permitting was also completed as required by the Maine DEP and the Maine Department of Inland Fisheries and Wildlife.

Caribou Downtown Revitalization Project, Phases I and II; Maine: Completed site topographical survey and managed Design Charrette for conceptual site and façade design master planning. Managed and prepared the preliminary and final designs of the Phase I Sweden Street portion of the project and the Phase II Downtown Mall portion of the project. Improvements included the removal of a 26' x 280' mall canopy and associated concrete sidewalks as well as the installation of sidewalk trees, historic lighting, decorative pole banners, and the removal and reuse of existing concrete sidewalk pavers. The project also included electrical coordination with Maine Public Service for the removal of an underground transformer and the subsequent replacement with an above-ground transformer, serving 32 businesses. Provided construction monitoring and administrative services for both phases of the project. Each portion was funded, in part, by CDBG.

Jodi O'Neal, EI, CPESC

Staff Engineer

Mrs. O'Neal joined the James W. Sewall Company in January of 2007. She has eight years of experience in engineering design and permitting. Her primary focus is in wind power, commercial/retail development and subdivision design which includes site and utility design, stormwater management, and environmental and construction related permitting.

EDUCATION

BS in Civil Engineering, University of Maine, Orono, 2002

PROFESSIONAL CERTIFICATION

Engineer Intern

Certified Professional in Erosion and Sediment Control #3888

RELEVANT EXPERIENCE

STAFF ENGINEER

Stormwater Design and Analyses Successfully designed and permitted many stormwater systems for many different types of sites from complex wind power projects, commercial developments, subdivisions and mining operations to small site reconfigurations throughout the state. She uses the existing grade of the land to accomplish stormwater treatment to the best extent possible. This preserves the natural beauty of the site and minimizes development costs.

Kibby Wind Power Project, Kibby & Skinner Townships, Maine. Stormwater analysis, erosion and sedimentation control and permitting for civil road and site redesign for proposed 132MW wind farm including 44 Vestas V90 3.0MW wind turbine generators. Permitting was done through the Maine Land Use Regulation Commission

Record Hill Wind Project, Roxbury, Maine. Stormwater analysis, erosion and sedimentation control and permitting for civil road and site redesign for proposed 50.6MW wind farm including 22 Siemens 23MW wind turbine generators. Permitting was done through the Maine Department of Environmental Protection for a Site Location of Development Act permit.

ALSID Site, Bangor, Maine. Design and permitting for 3+ acre commercial lot including site and storm drainage design and utility coordination. Permitting included MDEP Stormwater Permit and local Site Plan approval.

Emerson Mill Road Pit, Hermon, Maine. Design and permitting for a commercial clay mining pit. This was a sensitive erosion and sedimentation control project because it was a large exposed area that is constantly being disturbed. This project had to meet both State and Local requirements.

Kayden's Corner Subdivision, Hermon, Maine. Designed roadway and lotting for a 10 lot residential subdivision. configuration to maximize lot efficiency and minimize wetland impacts. Used soil filters for stormwater drainage control. Represented the client at planning board meetings. Achieved State and local approval.

Wind Energy Projects in Maine

Sewall has a history of successful design and permitting work on wind projects as depicted below.

	Wind Energy Projects								
	Mars Hill Wind, Aroostook County, ME	Stetson Wind Washington County, ME	Stetson II Wind, Washington County, ME	Kibby Wind, Franklin County, ME	Record Hill Wind, Oxford County, ME	Highland Pft. Wind, Somerset County, ME	Rollins Wind, Penobscot County, ME	Bull Hill Wind, Hancock County, ME	Bowers Wind, Penobscot & Washington Counties, ME
Project Details									
Turbines	28	38	17	44	22	48	40	19	27
Installed Capacity (MW)	42	57	25.5	132	50.6	128.6	60	34.2	69.1
Access/Ridgeline Road length (miles)	11	15	6	36	7	23	14	5	10
Turbine Elevations – Range (feet)	668-1710	668-1069	625-903	2483-3234	1762-2140	1552-2237	573-999	395-611	707-1138
Project Status									
Operational	2007	2009	2010	2009					
Under Construction					√		√		
Permitting Phase						√		√	√