Section 6
Land Division History

6.0 Land Division History

Pursuant to Section 10.25.Q, the Applicant is required to trace the land division history of the lot where the development is proposed from the parent lot, over the past 20 years, to determine if the new lot formation constitutes a subdivision.

Highland Wind LLC reviewed the land records of Bayroot LLC with respect to its property in Highland Plantation, Somerset County, from September 1, 1990 to December 13, 2010. As of September 1, 1990, title to Bayroot's property in Highland Plantation was vested in Oxford Paper Company. Highland Wind's review of title discloses the following items of record affecting Bayroot's land in Highland Plantation appearing after September 1, 1990:

1. Deed of Easement from Julian M. Dunphy to Oxford Paper Company dated June 30, 1992 and recorded in Book 1805, Page 316.

2. Deed from Oxford Paper Company to Julian M. Dunphy dated June 30, 1992 and recorded in Book 1820, Page 216, conveying a parcel of land of six acres, more or less, to abuttor. The deed also conveys an easement; said easement is on an outparcel, and not contiguous with the parent parcel for this Project.

3. Deed from Oxford Paper Company to Mead Oxford Corporation dated January 1, 1996, recorded in Book 2256, Page 59 (Mead's source deed).

4. Deeds of Easements between Buckfield Timber LLC and Mead Oxford Corporation dated July 2, 1999 and recorded in Book 2573, Pages 75, 83 and 128.

5. Deed of Easements from Julian M. and Lelia G. Dunphy to Mead Oxford Corporation dated June 11, 2002, recorded in Book 2962, Page 61.

6. Amended Application of Mead Oxford Corporation reflecting name change to MeadWestvaco Oxford Corporation, dated January 16, 2003, recorded in Book 3088, Page 182.

7. Deed from MeadWestvaco Oxford Corporation to Bayroot LLC dated November 24, 2003, recorded in Book 3237, Page 181 (Bayroot's source deed).

8. Deed from Bayroot LLC to Linkletter Timberlands, LLC dated May 24, 2004 and recorded in Book 3327, Page 329, conveying stand-alone parcel on southerly town line, adjacent to Lexington, and not contiguous with the parent parcel for this Project.

9. Notice of Layout and Taking in favor of the State of Maine dated March 8, 2006 and recorded in Book 3650, Page 159, conveying slope, drainage and channel diversion rights, but no fee interest.

Please note that Items 2 and 8 reflect transactions regarding outparcels; i.e. parcels not contiguous with the parent parcel.

Appendix 6-1

Bayroot LLC
Highland Plt
Somerset Co., ME

Highland Plt Wind Park Map

"ROADS" CLASSES

- 1 - Primary Paved Hwy
- 2 - Secondary Paved Hwy
- 3 - Light Duty Rd
- 4- -Main Gravel "Owned" Rd
- 5 - Secondary Gravel "Owned" Rd
- 6 - Un-maintained/Winter "Owned" Rd
- 7 - Old Grown-in "Owned"Rd
- 8 - Railroad
- 9 - Hiking Trail
- 12 - Power Line
- 0 - Undesignated
- 50 - Forester Added Rd
- 51 - ROW Secondary
- 61 - ROW Winter
- 71 - ROW Old Grown In
- 96 - ROW Grant to Other
- 97 - AT Associated Trail
- 98 - AT Trail
- 99 - ROW Grant

WET NF

- AL - Alder
- BG - Bog
- FL - Flowage
- PG;/RV;/WA - Great Pond, River, Water
- TL - Transmission Line

WIND PARK FEATURES

- Turbines
- 101m Rotor Diameter
- MET Towers (Potential Permanent)
- Poles
- Dwellings & Structures
- Overhead Electric System
- Underground Collection System
- SW Phosphorus Buffer
- SW Vegetation Buffer
- Laydown & Yarding Areas
- OM Buildings
- Vernal Pool
- RipRap Areas
- Crane Pad
- Roads & Pads
- Clearing Limits

OTHER SYMBOLOGY

- Highland (Moxie)
- Bayroot LLC Lands
- Waterbodies
- 1 Intermittent Stream
- 2 Perennial Stream
- 3 Forester Added Stream
- state
- county
- town

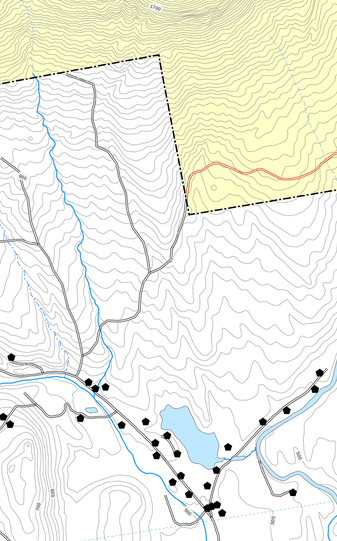
WAGNER FOREST MANAGEMENT, LTD.

Projection: UTM Nad 83 Zone 19
Scale: 1 to 15840 1" = 20 chains
Cover types based on Fall '04 & Spring '05
color IR aerial photography
Base GIS data from WFM
Other GIS data from Sewall processed by Stantec

Feb 08, 2011

DECLINATIONS W (2006): 16 - Pittsburg, NH
17 - East Moxie, ME, 18 - Hersytown, ME

0 660 1,320 2,640 3,960 Feet



Section 7
Existing Uses and Structures

7.0 EXISTING USES AND STRUCTURES

The Project consists of both a generating facility and associated facilities, including a generator lead. The proposed location of the generating facility is located entirely on land currently used for commercial logging operations.

Logging activities will continue, unimpeded, in the surrounding area, except to the extent limited by those obligations set forth in this Application. The Project will be using the existing network of roads associated with those logging activities, with upgrades where appropriate, to provide construction and operational access. This will reduce the need for new road development.

A total of approximately 3.1 miles of existing logging roads will be used and rebuilt or upgraded to the extent necessary, and approximately 18.2 miles of new roads will be constructed. These improvements will facilitate, and will not substantially impede, the continuing commercial land management activities in the area. The Project is designed such that new roads will avoid wetland and stream impacts wherever practicable. Aside from the existing network of logging roads, the only other structures located on the Project ridgelines are five temporary meteorological (met) towers.

In addition to its use as a commercial timberland, the property on which the proposed generating facility will be constructed is also used for recreation. The principal recreational use of the property is hunting, but the land is also used for snowmobiling and all-terrain vehicle use. These uses will continue, substantially unchanged, after development of the Project. There will be times during construction, however, when certain areas within the proposed development will be off-limits to recreationalists for safety reasons.

The 9.5-mile long generator lead for the Project is similarly compatible with existing land uses. In addition to being co-located with an existing Central Maine Power Company-owned transmission line for the majority of its length, the generator lead route also passes through commercial timberland for the majority of its total length.

Section 8
Financial and Technical Capacity

8.0 FINANCIAL AND TECHNICAL CAPACITY

Pursuant to Land Use Regulation Commission (LURC) Rule Chapter 10.25.C, prior to development, an Applicant must demonstrate that:

1. It has adequate financial resources to construct the proposed improvements, structures, and facilities and meet the criteria of all state and federal laws and the standards of these rules;.and
2. It has retained qualified consultants, contractors and staff to design and construct proposed improvements, structures, and facilities in accordance with approved plans.

This section sets forth evidence of the financial capacity of the Applicant as well as a commitment to provide evidence to LURC of financing for the Project prior to commencing construction of the Project.

This section also sets forth the qualifications of the Applicant's technical team, and commits the Applicant to demonstrating to LURC the adequate qualifications of the selected contractor prior to beginning construction.

8.1 Financial Capacity

Attached hereto in Appendix 8-1 are the following documents demonstrating that Highland has the requisite financial resources to construct the Project:

- A letter of interest from CoBank, ACB, a leading bank in financing energy and power development projects, stating that CoBank has an excellent working relationship with the manager of the majority member of Highland Wind LLC and that CoBank believes that Highland Wind LLC has the ability to develop, construct, own and operate the project;

- A letter from The Northern Trust Company, confirming the assets of the "controlling majority owner" of Highland Wind LLC;

- A letter from Thomas Colgan, Vice President of Highland Wind LLC, President and CEO of Wagner Forest Management, Ltd., and manager for the majority member of Highland Wind LLC, of which the "controlling majority owner" is a part, confirming the authority of Highland Wind LLC to access the very significant, financially adequate resources of its members for expenditures related to permitting and financing this project; and

- A memo from Michael Novello, Secretary of Highland Wind LLC and an employee of Wagner Forest Management, describing, *inter alia*, the process by which financing for large projects is obtained, and how Highland plans to use that process to obtain financing.

In addition, Highland proposes to protect the public interest against inadequately funded construction by committing to provide LURC with evidence of financing for the Project prior to commencing construction, and is willing for its permit to include that as a condition.

Additional information regarding the funding of Highland's decommissioning plan is provided in Section 22.

8.2 Technical Capacity

The project team involved in the development of the Highland Wind Project is nearly identical to the project team involved with the successful Record Hill Wind Project. This team has significant experience in all facets of design, construction, and financing necessary to construct and operate wind projects.

The project team consists of:

- The members of Highland Wind, LLC, which includes the members of Independence Wind LLC;
- Wagner Forest Management Ltd.;
- Stantec Consulting (natural resource assessments, permitting);
- James W. Sewall Company (civil engineering);
- RLC Engineering, Inc. (electrical engineering design);

- Terrence J. DeWan and Associates (visual impact analysis);
- Evan Richert, AICP
- Bruce Lockwood, Portland Research Group
- Resource Systems Group (sound assessment);
- TRC/Northeast Cultural Resources (prehistoric archaeological resources),
- Independent Archeological Consulting (historic archaeological resources),
- Public Archeology Lab (historic architectural resources); and
- Albert Frick Associates, Inc. (soils).

Each consultant was chosen because of their considerable and well respected expertise in their respective disciplines. Resumes of the key team members are attached (Appendix 8-2).

Appendix 8-1

CoBANK™

November 8, 2010

Marcia Spencer-Famous
Maine Land Use Regulation Commission
22 State House Station
Augusta, Maine 04333-0022

RE: Highland Wind LLC Project

To Whom It May Concern:

CoBank, ACB ("CoBank") is writing this letter in support of Highland Wind LLC's proposed wind project to be located in Highland Plantation, Maine (the "Project").

We also understand that Highland Wind LLC intends to raise non-recourse debt financing for the Project. CoBank, as a provider of construction and term debt financing for wind energy projects, hereby confirms that it intends to provide a proposal for the financing of the Project subject to certain conditions including, among other things, financeable contracts for power. In order to be financeable, the off-takers must be creditworthy and purchase electricity to provide cash flows over the contracted period sufficient to amortize all of the debt.

CoBank has been a leader in energy and power finance for many years, having arranged and provided financing for numerous power related projects in the United States. In the last two years, CoBank has either led or participated in several wind financings. CoBank is a member of the Farm Credit System, a Government Sponsored Enterprise, which has over $208 billion in assets. CoBank individually has over $45 billion in assets and carries a credit rating of AA – by S&P and Fitch.

In addition, CoBank has had an excellent working relationship with Wagner Forest Management who oversees the property being developed by Highland Wind LLC. Based upon several discussions, CoBank believes that Highland Wind LLC has the ability to develop, construct, own and operate the Project.

This letter is not meant to be, nor shall it be construed as, a binding commitment to provide financing. Any commitment by CoBank to provide financing is subject to satisfactory due diligence (including the receipt of such information as may be deemed necessary, as well as review of all documentation) and obtaining credit approval from CoBank's credit committees. Please feel free to contact us if you have any questions in connection with the above.

Sincerely,

Brett A. Challenger
Division Manager
Energy Services Division
CoBank, ACB

The Northern Trust Company
50 South LaSalle Street
Chicago, Illinois 60603
(312) 630-6000

Northern Trust

December 17, 2010

Maine Land Use Regulation Commission
22 State House Station
Augusta, Maine 04333-0022

Dear Commission:

The controlling majority owner of Highland Wind, LLC ("the Client") has been a custody client of The Northern Trust Company ("the Bank") for over eight years. At the behest of the Client, we are confirming the Client's availability of funds to finance the development of Highland Wind, LLC's proposed windfarm in Maine in compliance with environmental laws and regulations, which is currently undergoing permit review by the Maine Land Use Regulation Commission ("the Development"). We understand the estimated cost of the Development to be approximately $245 million.

As of December 15, 2010, the Client had unencumbered cash and securities at the Bank in excess of $245 million, and on every day of at least the past year, has had unencumbered cash and securities of at least $245 million.

The Bank makes no claims about the continued availability of those assets. This letter does not represent a letter of credit from the Bank, and the Bank is in no way compelled to fund any aspect of the Development.

Yours truly,

Jeffrey M. Porta
Senior Vice President

WAGNER
FOREST MANAGEMENT, LTD.

February 4, 2011

Ms. Catherine Carroll
Ms. Marcia Spencer-Famous
Maine Land Use Regulation Commission
22 State House Station
Augusta, Maine 04333-0022

Dear Ms. Carroll and Ms. Spencer-Famous:

I understand questions have been raised concerning whether Highland Wind, LLC's ("Highland") application has sufficiently demonstrated, for purposes of completeness for processing determination, that it has "adequate financial resources to construct the proposed improvements, structures, and facilities and meet the criteria of all state and federal laws and the standards of these rules". This letter is intended to help you understand more clearly the organization of Highland and its financial resources. In addition, Highland will be amending section 8 of its revised application (December 29, 2010) to contain the information presented below.

As I believe LURC is aware, Wagner Forest Management, Ltd. (Wagner), which has been in business since 1955, currently manages 1.1 million acres of timberland in the state of Maine and a total of 2.5 million acres throughout New England and eastern Canada. Wagner manages this large expanse of timberland on behalf of our clients, who are institutional investors and high net worth individuals. In addition to performing this timber management role for timber assets currently owned by our clients, Wagner also identifies and invests client funds in additional attractive timberland opportunities, as well as selected energy opportunities. In this investment capacity, over the last 15 years Wagner has raised over $1 billion dollars in funds from our clients. In all of the large timberland and energy investments that Wagner has made on behalf of these clients, Wagner also invests our own funds alongside our clients. I am the President and CEO of Wagner, and have held this position since 1997.

In order to develop, construct and operate a wind farm in Highland Plantation, in January 2008 Wagner and Independence Wind LLC -- owned by Robert H. Gardiner and Angus S. King, Jr. -- joined forces to cause the creation of Highland. Highland is owned by two members: (1) Independence Wind LLC, and (2) a consortium of private institutional and individual investors with whom Wagner has worked for decades. This consortium of private investors is the majority owner of Highland.

One of the investors in this consortium is Wagner. Another investor -- the principal investor in the consortium -- is the "Client" referred to in the December 17, 2010 letter from the Northern Trust Company. It is this private investor who, "on every

Phone: 603-795-2002 • **Fax:** 603-795-4631 | PO Box 160 • 150 Orford Rd • Lyme, New Hampshire 03768 | WagnerForest.com

day of at least the past year, has had unencumbered cash and securities of at least $245 million" at the Northern Trust Company. This private investor was aptly labeled the "controlling majority owner" of Highland by Northern Trust Company in its letter because of the scale of investment that this private investor has made and has pledged to continue to make in Highland.

The officers of Highland are as follows. Robert H. Gardiner is the President[1], Angus S. King, Jr. and Thomas J. Colgan are the Vice Presidents, and Michael Novello of Wagner Forest Management is the Secretary. Member duties are roughly divided up and allocated as follows. Independence Wind LLC is charged with studying all potential impacts of the project, as presented in the initial and now revised application, with explaining the project publicly, and with working with Highland Plantation residents and other interested parties and individuals. Wagner, on behalf of the consortium of investors and as explained below, is charged with managing all financial aspects of the project, including all financial transactions. Matters involving selection, design and siting of project components have been jointly shared.

Similar to innumerable other investments in which Wagner serves as investment manager for these long-standing private investors, the consortium's interest in Highland is managed by a Wagner-owned subsidiary that was created specifically for this purpose. This management company is called Wagner Wind Energy II, LLC. In its role as manager for the controlling owner, Wagner Wind Energy II, LLC has kept all our consortium investors up to date on the progress and development of our project. All the members of Highland, including the investors in the consortium, understand that the total project cost of a fully completed Highland wind farm will be close to $250 million. The Highland Wind LLC agreement gives the manager, Wagner Wind Energy II LLC, the authority to issue capital calls to Highland's members to fund the expenses associated with this project. The members of Highland, including all consortium investors, remain fully committed to seeing this project through to completion. To date, Highland's investors, including those who are part of the consortium, have spent more than $5 million on this project.

As mentioned in our permit application, Highland supports LURC conditioning any permit on a requirement that, prior to the commencement of construction of the project, Highland must demonstrate to LURC that it has in place the financial resources required to properly construct and legally operate the project.

Thank you for your attention to this supplemental information.

---

[1] In one place in the revised Highland application (*see* Section 1.0, Applicant Information), the following sentence appeared: "The Applicant's representative is its Managing Member, Rob Gardiner, and its agent is Stantec Consulting Services, Inc." Consistent with other places in the application and in a host of legally-binding easements and other agreements related to the Highland project, Rob Gardiner should have been described as President and not Managing Member. All other aspects of this sentence are correct.

Sincerely,

Tom Colgan

Tom Colgan

President and CEO
Wagner Wind Energy II, LLC
Wagner Forest Management, Ltd.

WAGNER
FOREST MANAGEMENT, LTD.

MEMORANDUM

To: Katherine A. Joyce, Bernstein Shur

From: Mike Novello, Wagner Forest Management

Re: Project Financing Overview for Highland Wind; Explanation of CoBank Terminology

Date: February 1, 2011

Because of statements made by attorneys for Friends of Highland Plantation and the Maine Appalachian Trail Club in letters recently sent to LURC concerning how wind development projects are financed and when, you have asked that I provide you a memorandum containing an overview of wind development financing. I have done so here. In addition, I have provided explanations to questions asked by Marcia Famous Spencer in her letter to you dated January 28, 2011.

As you know, I am employed by Wagner Forest Management, and have been managing all financial aspects of Highland Wind LLC since its inception, including budgeting, expenditures of investor money for permitting costs, work with potential turbine vendors, and preliminary discussions with potential internal and third party sources of construction financing. I began working for Wagner in 2007 and during that time, one of my responsibilities was to successfully finance the installation of a 27.6 kW solar energy system for the company. Prior to working for Wagner, I spent 4 years as a financial analyst for GE Energy. I hold a Bachelor of Arts degree from Dartmouth College, and an MBA from the Lally School at Rensselaer Polytechnic Institute.

Project Finance Explanation:

From a conceptual standpoint, buying a wind farm is not fundamentally different from buying a house (albeit a very expensive house). Although there are many subtle nuances about the exact mechanism of project finance for wind farms, all of these variations boil down to two major categories -- all-equity financing, or equity + debt financing -- and in that way, are parallel to the process of house buying.

100% equity financed projects are exactly what their name implies – wind farms that are financed solely with the cash of the owner of the wind farm. This would be akin to having enough money in your checking account to simply write a check for the full amount of the purchase price to the current owner of the house you wish to buy. Obviously very few people are able to simply purchase a new home outright. Even smaller are the number of people who actually do so – given the availability of mortgages, many people who could afford to purchase their home outright choose to take out a mortgage for some portion of the purchase price.

As in the house example, there are very few companies in the world that either are able or even willing to build a wind farm solely with the money in their bank account, given the availability of commercial financing for these projects. If it were a requirement for showing financial capacity that a grid-scale wind project developer prove, *at the beginning of the development permitting process and prior to that project having obtained the requisite permits,* that the developer has sequestered in a separate bank account and will leave untouched until construction begins the tens or hundreds of millions of dollars required for project construction, very few wind developers, if any, would either be able to demonstrate financial capacity at the outset of permitting or be built. It is my understanding that no other grid-scale wind project permitted by LURC has ever been required to meet this test.

Thinking about the wider economy and the way in which major development projects of any kind are financed, this precept is nearly universal - almost no business can or would choose to build a new office, a new auto body shop, or a new hotel solely with their own out of pocket cash, nor would they sequester this full amount of cash prior to receipt of permits. The majority of large business expenses are paid for with the assistance of a loan, committed after permitting and other significant pre-construction issues have been resolved. In the housing analogy, the vast majority of people who buy a home in the US take out a mortgage. To obtain a mortgage, a bank must evaluate the value of the property, verify that you have enough income to make your monthly payments, and evaluate your legal right to the property (for example, a valid deed). Banks currently and historically also require the buyer to make a significant down payment (equity), traditionally 20% of the purchase price.

Commercial project finance is similar to a home mortgage in many respects – a lending institution evaluates the value of the property, verifies project cash flows, and ensures sufficient legal standing to undertake the construction. It also generally requires an investment in equity, though the exact percentage varies project by project. However, it is useful to note that this analogy breaks down in one very important aspect – complexity. Appraising a house and validating zoning restrictions and deed history are relatively simple. For a bank to evaluate a wind project, it must bring in significant technical expertise. A bank will have experts examine the project's wind resource, the technical competence of the construction team, and have its lawyers review all of a project's contracts and permits. As you may expect, all of these investigations are expensive and banks are not willing to devote resources to these investigations without certain hurdles being met first. One of the most significant hurdles is that a project have its permits before significant bank review can begin. For better or for worse, environmental permits have become a de facto pre-condition for commencement of significant due diligence efforts by lending institutions. Therefore, by necessity, it is impossible to provide LURC with a legally binding commitment regarding the actual financing structure until after permits are granted.

Instead, and by way of comparison, many grid-scale wind projects constructed in New England were financed in part by third parties, with loan commitments made subsequent to the issuance of major permits. Most recently, the Rollins Mountain project in Maine and the Sheffield Project in Vermont received final financing commitment well after receipt of major state environmental permits. A quick search for the term "financing" on sites like http://northamericanwindpower.com will turn up numerous examples demonstrating that it is the rule, not the exception, to receive financing after

receipt of permits. For a more detailed exposition on the subject, a useful resource is the report "Wind Project Financing Structures: A Review and Comparative Analysis" put out by the Lawrence Berkeley National Laboratory (http://eetd.lbl.gov/ea/emp/reports/63434-ppt.pdf).

It is in this context that the relevance of Highland Wind's documentation on financial capacity contained in its revised application becomes clear. Highland Wind has provided to LURC in its revised application two bank letters. One is from Northern Trust Company. The letter being provided to LURC now from Thomas Colgan, Wagner's President and CEO, contextualizes for LURC the information contained in the Northern Trust letter.

The second letter provided in the revised application is from CoBank, and addresses the fact that, although Highland's sponsors have sufficient cash on hand as demonstrated by the Northern Trust letter, as with many homeowners and businesses Highland at this point in the process is planning to seek a loan for a large portion of construction costs. To demonstrate a reasonable likelihood of success in that effort, Highland has provided a letter from CoBank, a well qualified lender, stating that Highland Wind is exactly the type of high quality wind project they typically finance. CoBank is one of many lending institutions that Highland has talked to about financing. I believe that part of the reason CoBank reached this conclusion and was willing to write this letter to LURC is because CoBank knows that the members of the Highland project have the financial wherewithal to bring the project to completion, and that sponsor equity will be sufficient to ensure CoBank will be satisfied that Highland Wind is a worthy project for a loan.

However, given that the project does not yet have all necessary permits, neither they nor other financial institutions will begin their due diligence at this time. This timing is of no concern to the members of Highland Wind, who have at this point and as noted in the letter to LURC from Mr. Colgan, already expended $5 million in advancing this development proposal, and plan to spend millions more. This is the normal course of events and timing for project financing.

Brief Outline of Business Plan:

For purposes of meeting the financial capacity requirement, LURC should know the following, which should be read in combination with the other information provided in this memorandum, the letter from Mr. Colgan, and the other materials submitted in the revised application. Highland intends to expend, using its internal capital, the reasonable and necessary funds to obtain all required permits in a form acceptable to Highland's members. On an ongoing basis, Highland is carefully assessing the powers sales market, and following receipt of all required permits will pursue and execute a power purchase agreement with a credit worthy counterparty, unless Highland determines that market conditions are such that alternative sales arrangements are more financially attractive. At the same time, Highland will be assessing its opportunities for third-party construction financing, and the appropriate combination and balance of internal equity provided by its members to finance construction versus a third party loan and/or other third party financing arrangements. As stated in Mr. Colgan's letter, Highland supports LURC conditioning any permit on a requirement that, prior to the

commencement of construction of the project, Highland must demonstrate to LURC that it has in place the financial resources required to properly construct and legally operate the project.

Explanation of certain terms used in CoBank letter.

In response to an inquiry regarding the meaning of certain terms used in the CoBank letter, I provide the definitions below. Note that the first three definitions maintain a close parallel to the comparision with home financing I provided above. The remaining two terms are more specific to a power generation project.

1. Non-recourse debt financing: financing obtained in exchange for a pledge of collateral
2. Term debt financing: financing for which repayment is made over more than one year
3. Creditworthy: considered suitable to receive credit, because of payment history or other indicia of ability to repay
4. Financeable contracts for power – power purchase agreement, or similar agreement, with a creditworthy party on reasonable terms
5. Off-takers – buyer under a power purchase agreement

Appendix 8-2

September, 2008

ROBERT H. GARDINER

PROFESSIONAL POSITIONS:

2007 - present	President, Independence Wind LLC
2004-07	Vice President and Maine Advocacy Center Director, Conservation Law Foundation, Brunswick, Maine
1992 - 2002	President, Maine Public Broadcasting Corporation
1988-92	President & General Manager, WCBB-TV Lewiston, Maine
1983-87	Director, Maine Bureau of Public Lands (State Government Agency)
1978-83	Executive Director, Natural Resources Council of Maine
1971-78	Production Manager & Producer/Director WCBB-TV
1968-70	Lt. (JG) in U.S. Navy

OTHER ACTIVITIES:

Current:

- Director, Baskahegan Company
- Trustee, Dresden Church Fund
- Member and past Chairman, National Wildlife Federation's President's Council
- Member, Savings Bank of Maine Advisory Board
- Trustee, Forest Society of Maine
- Trustee, John Merck Fund
- Member, Trust for Public Lands Maine Advisory Board

Past:

- Vice Chair, PBS Board of Directors
  - Chairman, PBS Membership Committee
  - Chairman, Subcommittee on Enhanced Underwriting Research
- Chairman, PBS Governance Committee
- Chairman, National Wildlife Federation
- Vice-Chair, Organization of State Broadcasting Executives
- Director, Central Maine Power Company
- Trustee, Conservation Law Foundation
- Trustee, American Program Service
- Member, Maine Economic Growth Council
- Trustee, National Wildlife Federation Endowment
- Member, Maine Coalition for Excellence in Education
- Member, Maine Humanities Council

Trustee, College of the Atlantic (Bar Harbor)
Trustee, Portland Museum of Art
Trustee, Wolfe's Neck Farm Foundation
Member, Governor's Commission on Scientific Literacy
Baxter State Park Advisory Committee
Maine Forest Products Council
Cooperative Forestry Research Unit (UMO) - Advisory Committee
Maine Audubon Society Board of Trustees
Moderator, New Gloucester Town Meeting
New Gloucester Conservation Commission
Governor's Commission to Evaluate the Department of Environmental Protection
Co-Chair, New England Earth Day 1990

DEGREES:

Harvard University, BA 1966
University of New England, Honorary Doctor of Humane Letters, 1993

AWARDS:

Maine Broadcaster of the Year, 2002
Virginia Ball Volunteer Leadership Award, National Wildlife Federation, 1999
Special Leadership Award, PBS Board of Directors, 1997
Twenty-first Century Award, America's Public Television Stations, 1992
Media Advocate of the Year, U.S. Small Business Administration, 1990
President's Award, The Nature Conservancy, 1987
Special Merit Award, Environmental Protection Agency Region I, 1982
Affiliate of the Year, National Wildlife Federation, 1982
Special Award, The Wildlife Society, 1977

PERSONAL:

Married to Anne McIlhenny

Children: Marsh (36), Avery (33), Kate (30), Elizabeth (20)

Address: 110 Foreside Road
Cumberland Foreside, Maine 04110
(Home) (207) 781-8741
e-mail address: roberthgardiner@gmail.com

Michael Novello

Wagner Forest Management, Ltd.

Education

Rensselaer Polytechnic Institute

- **Lally School of Management and Technology**
- Master of Business Administration
- Customized study to focus on Renewable Energy Systems Management and Policy
- Relevant courses: Managing Energy Issues, Solar Energy Engineering, Electricity Systems in Developing Countries, Managing Environmental Disputes, Managing Technical Projects, Competitive Advantage (Strategy)

Dartmouth College

- Bachelor of Arts
- **Biology Major** with High Honors

Experience

Wagner Forest Management, Ltd.

- Renewable Energy Analyst

GE Energy – Clean Coal & IGCC

- Financial Analyst – Sales and Margin

GE Energy – Solar Technologies

- Financial Analyst – Operations

AstroPower

- Financial Analyst

Lighting Research Center

- Energy Policy Intern

Angus S. King, Jr.
15 Potter Street
Brunswick, Maine 04011

Born: Alexandria, Virginia, March 31, 1944

Education: BA, Dartmouth College 1966;
LL.B. University of Virginia Law School, 1969

Personal: Married to Mary J. Herman; five children--Angus III (born 1970), Duncan (born 1973), James (born 1975), Benjamin (born 1990), and Molly (born 1993).

Employment: 1969-1972, Staff Attorney, Pine Tree Legal Assistance, Skowhegan, Maine;

1972-1975, Legislative Assistant, Chief Counsel, United States Senator William D. Hathaway. Responsibilities included legislation involving labor matters, education, transportation, and communications;

1975-1983, Private practice of Law with the firm of Smith, Loyd, and King, Brunswick, Maine;

1983-1989, Vice President and Chief Counsel, Swift River-Hafslund Company, Boston, Massachusetts and Portland, Maine. The company developed alternative energy (hydro and biomass) projects in New England, ranging in size from 1 to 15 MW; responsibilities included permitting, equipment contracting and purchase, project finance, and general business activities;

1989-1994, Founder, Owner, and President, Northeast Energy Management, Inc. The company developed, installed, and operated large-scale electrical energy conservation projects at commercial and industrial facilities throughout south-central Maine. Upon completion, the projects saved the company's customers 48 million kwh per year (enough power to supply 8,000 homes). Responsibilities included initial conception of the business model, contracting, project finance, and overall supervision of staff and subcontractors.

1976-1993, host and co-producer of public affairs programming on

Maine PBS stations (part-time). Hosted weekly McNeil-Lehrer type program from 1980 to 1993 as well as various public issue discussions, candidate debates, and special productions, including interviews with Ed Muskie, George Mitchell, Malcolm Forbes, Margaret Chase Smith, William F. Buckley, David Broder, and others.

1995-2003, Governor, State of Maine. Elected as an independent in 1994 in first run for public office; re-elected in 1998 by one of the largest margins in Maine history. Policy focus during term included economic development and job creation, education, mental health services, corrections, land conservation and environmental protection, and improvements in service delivery by state government. Responsible for $2.5 billion budget and 13,000 employees.

Accomplishments included a major rebuild of the state's mental health and corrections systems, including both program and infrastructure; improvements in the state's service capability, especially including on-line services; a substantial increase in the state's commitment to research and development; the largest increase of lands in conservation in the state's history; and the nationally recognized program to provide a laptop computer to every seventh and eighth grade student in the state, regardless of location or family income, aimed at making Maine's students the most computer literate in the world.

Current Employment:

Distinguished Lecturer, Bowdoin College, Brunswick, Maine;
Of Counsel, Bernstein, Shur, Shur, Sawyer and Nelson, Portland, Maine;
Associate, Leaders LLC, Portland, Maine
Fall 2004, Visiting Fellow, Institute of Politics, John F. Kennedy School of Government, Harvard University
Commentator, NOW with David Brancaccio (PBS-TV)
Principal, Independence Wind, LLC (energy development)

Boards:

W.P. Stewart & Co., Inc., Investment advisors;
Hancock Lumber/Hancock Land Companies, Casco, Maine;
Lee Auto Group, Westbrook, Maine;
Maine Chapter, The Nature Conservancy
Chair, Maine Learning Technology Foundation
Vice Chair, Federal Commission on the Future of Medicaid

Jonathan T. Ryan

Senior Associate

Jonathan Ryan is a Senior Associate and Practice Leader responsible for providing strategic planning, business development, quality assurance and quality control, and complex project coordination and management. He has provided strategic environmental planning, regulatory support, and permitting direction for a wide range of development projects across the Northeast. In addition to his development experience, Mr. Ryan also has significant experience providing environmental compliance advice to operating commercial and industrial entities.

Mr. Ryan has specific project management experience in the development of utility-scale alternative energy projects, major retail commercial facility projects, and regional transportation facility improvement projects. He is adept at complex project management and has demonstrated the ability to successfully manage and oversee staff and subcontractors from a wide range of technical and scientific disciplines. Mr. Ryan offers the unique ability to combine accomplished project management skills with established regulatory expertise. He has extensive experience composing and reviewing federal and state environmental permitting documents for projects of all sizes and is well versed in relating ecological principles to rules and regulations.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Senior Associate.
- Woodlot Alternatives, Inc. 2007. Project Manager.
- Pierce Atwood, LLP. 2002-2006. Associate Attorney.

EDUCATION

J.D., Duke University School of Law, Durham, NC, 2002

M.A., Environmental Sciences and Policy, Nicholas School of the Environment, Duke University, Durham, NC, 2002

B.A., Political Science, Colgate University, Hamilton, NY, 1998

PROJECT EXPERIENCE

Airport Planning and Environmental
Hancock County Regional Airport Expansion, Trenton, Maine
Managed state and federal natural resource permitting and mitigation design associated with a major runway safety area expansion project. Work managed included wetland delineations, impact assessments, and mitigation design and planning. The compensatory mitigation design included invasive species control and fish passage restoration projects in public lands.

Natural Resource Services
Private Client Gas Pipeline, Central Maine
Manages and oversees natural resource assessments and wetland delineations for a proposed 8-mile gas pipeline project. Provides natural resource constraint evaluation services, strategic planning, and route selection advice.

Jonathan T. Ryan

Senior Associate

Stroudwater Place, Westbrook, Maine

Provides overall project management in the development of this proposed $300 million destination retail development. Work managed includes natural resource assessment as well as preliminary strategy and constraint evaluation.

Juniper Ridge Landfill Expansion, West Old Town, Maine

Provides overall project management for this project to expand Maine's only publicly-owned landfill. Oversight of impact assessments and mitigation options. Responsibility for preparing state and federal natural resource permit applications.

Regulatory Permitting / Entitlements / Approvals

NPDES Permitting, Bennington, New Hampshire*

Coordinated NPDES permitting for specialty paper manufacturing facility. The facility discharges treated process water into the Contoocook River, a tributary to the Merrimack River. Responsibility included review of monitoring data, review of process revisions, and drafting and submitting the NPDES application.

Dragon Products Company, Thomaston, Maine*

Advised cement manufacturing facility concerning federal and state hazardous and solid waste implications of storing and/or reusing process byproducts. Also assisted in guiding client through a contested proceeding to close and fully reclaim two large stockpiles of waste material from the cement manufacturing process.

Representation of Telecommunications Companies, Plaistow, Epping, and Atkinson, New Hampshire*

Represented telecommunications companies in the towns of Plaistow, Epping, and Atkinson, New Hampshire for the siting of telecommunications facilities, including new telecommunications towers. Work centered on acquiring necessary land use permits and approvals.

Master Planning and Development, Biddeford, Maine*

Represented University of New England in successfully completing master planning and development projects on its Biddeford, Maine campus, including land use permitting for a new marine research facility and new dormitories. Also assisted the University in acquiring financing for these projects.

Regulatory Guidance and Strategic Planning Services, Augusta, Maine*

Provided a full range of regulatory guidance and strategic planning services to this industry organization. Successfully drafted and testified in favor of legislation before Maine State Legislature. Provided long-range planning assistance for development of the Sustainable Forestry Initiative in Maine.

NPDES Permit Support, Groveton, New Hampshire*

Represented New Hampshire-based pulp and paper mill in NPDES permit proceedings and appeal. Successfully appealed EPA enforcement action on facility's NPDES permit to use and discharge Connecticut River and Ammonoosuc River waters. Process went to the EPA's Environmental Appeals Board but was resolved prior to a formal hearing. Ultimately acquired NPDES permit without penalty provisions.

Wind Farm Development

Private Client Wind Project, Western Maine

Provides overall project management and strategic planning services for this proposed 45-megawatt wind energy project. Responsible for managing natural resource inventories, avian and bat surveys, and civil design.

Private Client Wind Project, New Hampshire

Provides oversight for desktop environmental inventory and natural resource constraint evaluation for prospective wind development in New Hampshire.

Granite Reliable Project, Coos County, New Hampshire

Provided NHSEC testimony preparation and strategy development for wildlife biologists for this 66-megawatt wind project in northern New Hampshire.

** denotes projects completed with other firms*

Jonathan T. Ryan

Senior Associate

Private Client Wind Project, Central Maine

Provides overall project management and strategic planning services for this proposed 40-megawatt wind energy project. Responsible for managing initial natural resource assessments and electrical interconnection feasibility analysis.

Highland Wind Project, Highland Plantation, Maine

Provides overall project management, strategic planning, and state and federal site development and natural resource permitting services for this proposed 132-megawatt wind energy project. The project includes 48 turbines, 10 miles of transmission line, and associated infrastructure. Provides oversight over extensive natural resource inventories, avian radar surveys, raptor surveys, bat surveys, rare species evaluations, wetland assessments, and also advises civil and electrical design.

Record Hill Wind Project, Roxbury, Maine

Managed and drove necessary state and federal permitting for the proposed 50.6-megawatt wind energy project. Specific work included authoring and negotiating all state and federal development permits, resolving NHPA consultation, managing numerous subconsultants, and overseeing all civil and electrical design. Also drafted the Environmental Assessment needed for compliance with the Department of Energy's Loan Guarantee program.

** denotes projects completed with other firms*

Jonathan T. Ryan

Senior Associate

PUBLICATIONS

Ryan, J. Making Sense of Development and NHPA Compliance. *North American Windpower, at 38. Vol. 7, No. 3. April*, 2010.

Gray, K.F. and J.T. Ryan. Drinking Water Regulation. *In The Law of Environmental Protection, chs. 15.5 & 17. (Environmental Law Institute, ed.)*, 2007.

Gray, K.F and J.T. Ryan. The Uniform Environmental Covenants Act. *Maine Bar Journal, at 168. Available at http://www.mainebar.org/images/temppdf/MBJsummer06.pdf*, 2006.

Ryan, J.T. New Agendas at the Maine Air, Waste, and Land and Water Bureaus. *New England's Environment, at 40, Oct-Nov*, 2004.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

Mr. Gravel is a Project Manager at Stantec responsible for coordinating ecological inventories and environmental resource evaluations, including wildlife surveys, avian and bat impact evaluations, and habitat studies. Mr. Gravel has most recently been involved in organizing and conducting large-scale natural resource investigations associated with wind power and transmission projects. He has provided permitting and expert testimonial support to several New England wind projects and managed Stantec's New England based wildlife biologists. His field biology experience has allowed him to conduct avian radar surveys, breeding-bird surveys, winter track surveys, bat surveys, raptor surveys, and natural community surveys in Maine, New Hampshire, Vermont, Pennsylvania, Ohio, West Virginia, Virginia, and New York. Mr. Gravel takes an innovative, solution oriented approach to survey design and implementation which has enabled Stantec to conduct ecological surveys in some of the Northeast's most remote and challenging locations.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Project Manager.
- Woodlot Alternatives, Inc. 2004-2007. Project Manager.
- New Hampshire Division of Forests and Lands. 2003. Field Research Technician.
- University of New Hampshire. 2002-2003. Research Lab Technician.
- University of New Hampshire. 2002. Field Research Assistant.

EDUCATION

BS, Wildlife Management, University of New Hampshire, Durham, New Hampshire, 2003

40-hour HAZWOPER Certified, OSHA, Topsham, Maine, 2009

REGISTRATIONS

Certified Wildlife Biologist, The Wildlife Society

PROJECT EXPERIENCE

Natural Resource Services

Wind Farm Development Bird and Bat Surveys and Impact Studies, Mid-Atlantic, New England, Pennsylvania, Ohio, and New York

Mr. Gravel has managed and conducted pre-construction wildlife impact assessments at proposed wind energy projects at multiple sites in the Mid-Atlantic, New England, Pennsylvania, Ohio, West Virginia and New York. These assessments include habitat analyses, critical issues analyses, nocturnal migration surveys using marine radar, acoustic bat surveys, breeding bird surveys, raptor migration surveys, and ecological community characterizations. Mr. Gravel has effectively served as liaison between clients and regulatory agencies to ensure that studies and monitoring plans are in accordance with federal and state guidelines. Study results and determinations of risk have been provided to clients to assist with their project planning and permit applications in compliance with applicable local, state, and federal natural resource regulations. Mr. Gravel has also provided expert witness testimony for projects in Vermont and New Hampshire.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

Georgia Mountain Community Wind Project, Milton, Vermont

As Project Manager for this proposed 4.5 megawatt wind project, Mr. Gravel coordinated a nocturnal migration study using X-band radar. He also provided support for the Section 248 process, including participation in meetings with Vermont Agency of Natural Resources biologists and development of a work scope for nocturnal radar surveys. Mr. Gravel prepared and submitted pre-filed testimony and responses to discovery requests, and he provided expert witness testimony during subsequent evidentiary hearings before the Vermont Public Service Board.

Groton Wind Project, Grafton County, New Hampshire

Mr. Gravel is Project Manager for the proposed Groton Wind Project, which will consist of up to 25 2.0 MW turbines on the forested ridges of Tenney and Fletcher Mountains in the Sunapee Uplands of New Hampshire. He has coordinated numerous studies to address wildlife-related issues present in the vicinity of the project, including avian radar studies, acoustic bat surveys, and Breeding Bird Surveys (BBS) using the United States Fish and Wildlife Service BBS methods. Mr. Gravel worked with the New Hampshire Fish and Game Department to develop protocol and perform spring and fall raptor surveys, and collaborated with New Hampshire Audubon to conduct monitoring of peregrine falcons near the project area. He was involved in the drafting of an avian risk assessment that evaluated the potential impacts to birds and bats as a result of the project and provided expert witness testimony and support during the New Hampshire Site Evaluation Committee process.

Stetson Mountain Wind Farm, Washington County, Maine

Stetson is a 57 MW generation facility consisting of 38 turbines on a 6.5-mile, low-elevation ridge in Washington County, Maine. Mr. Gravel acted as Technical Lead responsible for avian and bat studies during the planning process and assisted in the design of a post-construction avian and bat monitoring program.

Highland Wind Project, Somerset County, Maine

Highland is a proposed wind energy facility consisting of 48 turbines. Mr. Gravel acted as Technical Lead during the planning process and was responsible for wildlife studies including nocturnal radar migration surveys, acoustic bat surveys, raptor migration surveys, and rare threatened or endangered species surveys. He acted a liaison between the client and state and federal resource agencies to develop work plans and avoidance and minimization measures during the planning phase of the project. Mr. Gravel also assisted in generating permit application materials for the project.

Granite Reliable Wind Park, Coos County, New Hampshire

Mr. Gravel has acted as the Project Manager on this long-term project, supervising and conducting a variety of natural resource surveys to assess potential concerns raised by the proposed project. Surveys included several seasons of nocturnal radar surveys, wetland and vernal pool reconnaissance surveys, multiple seasons of acoustic bat surveys, rare plant surveys, a raptor migration survey, and a Natural Community Characterization. A winter track survey was also conducted within the project site to document occurrence of American marten (State Threatened) and Canada Lynx (Federally Threatened). Mr. Gravel gave several agency presentations to summarize the multiple seasons of environmental surveys and their implications for the project and he has provided expert witness testimony regarding the work conducted at the site.

Hounsfield Wind Farm, Galloo Island, New York

As Project Manager for the nocturnal migration surveys conducted to determine site suitability for this proposed wind energy project located on Galloo Island in Lake Ontario. Mr. Gravel negotiated and designed a marine radar survey reflective of the unique location of this island site. Solutions to transport, maintenance, and site coverage were carefully determined in order to produce one of the most extensive migration surveys to date, successfully documenting avian abundance, flight patterns, and flight altitudes surrounding the site. Mr. Gravel and his project team were praised for their thoroughness and insights provided to state agencies.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

Mars Hill Wind Farm, Aroostook County, Maine

Mars Hill is a 28 turbine wind energy facility situated on a low-elevation ridge in Aroostook County, Maine. Mr. Gravel acted as Technical Lead during the planning process and was responsible for avian and bat studies including nocturnal radar migration surveys, acoustic bat surveys, raptor migration surveys, and morning bird stopover surveys. He also assisted in the design of a post-construction avian and bat monitoring program.

Lempster Wind Project, New Hampshire

As the Project Manager, Mr. Gravel was responsible for coordinating and conducting environmental surveys and providing permitting support for this 24 MW wind project, the first in New Hampshire. Tasks included developing and negotiating work plans with agencies, performing avian and bat studies, rare species investigations, vernal pool surveys, and providing testimonial support. Mr. Gravel was also involved in the initial development of post-construction bird and bat monitoring protocols for the project.

Record Hill Wind Farm, Maine

Mr. Gravel acted as Project Manager for the Record Hill wind project, which is a 22-turbine, 55 MW wind project on a forested ridge environment in the western mountains of Maine. For this project, he coordinated planning and feasibility studies, wetland delineations, wildlife impact studies, noise and visual impact assessments, and helped to coordinate all state and Federal environmental permitting.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

PUBLICATIONS

Giumarro, G. and A. Gravel. Assessing The Risk Of Avian And Bat Mortality At Commercial Wind Farms. *Presentation at the Windpower 2009 Conference and Exhibition, Chicago, IL*, 2009.

Pelletier, S.K., A.J. Gravel, and T.S. Peterson. Nocturnal avian flight heights relative to risk of collision with wind turbines. *Poster presentation at the National Wind Coordinating Collaborative conference in Wind Wildlife Research Meeting VII in Milwaukee, Wisconsin. October*, 2008.

Pelletier, S.K., C.W. Meinke, T.S. Peterson, and A.J. Gravel. 2008. Radar and acoustic bat surveys in pre and post-construction bird and bat mortality monitoring. *Poster presentation at the 2008 American Wind Energy Association conference in Los Angeles, California.*, 2008.

Gravel, A. Windpower and Wildlife an Overview of Pre-construction Survey Methods and Results. *Presentation to State and Federal Natural Resource Agencies.*, 2008.

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

Mr. Knapp is a Senior Project Manager and the Director of the Water Resources Division at Stantec. His primary responsibilities include project administration and management, ecological field surveys, strategic planning for permitting, and report preparation. In addition to managing and implementing large scale permitting and restoration projects, Mr. Knapp has conducted a variety of field biological sampling efforts to determine risk to ecological receptors and water quality determinations. He has also provided expert witness testimony regarding the findings of various ecological field surveys.

Under Mr. Knapp's direction, the Water Resources Division performs wetland delineations, vernal pool surveys, threatened and endangered species surveys, ecological community characterizations, permitting, biological assessments, environmental planning, fish and wildlife surveys, wetland mitigation and compensation, project management and document preparation in accordance with the state and federal regulatory agencies.

PROFESSIONAL EXPERIENCE:

- Stantec Consulting. 2007-present. Senior Project Manager, Director of Water Resources.
- Woodlot Alternatives, Inc. 2005-2007. Project Manager.
- Corinne Leary. 2002-2005. Field Scientist.
- Leary Soil Works. 2001-2002. Construction.

EDUCATION

BA, University of Maine, Orono, Maine, 2003

Preserving the Wetland Landscape - Tools for Successful Mitigation, Grappone Center, Concord, New Hampshire, 2006

Subsurface System Inspector, Joint Environmental Training Coordination Committee, Portland, Maine, 2006

Hydric Sandy Soils Workshop, Maine Association of Professional Soil Scientists, Scarborough, Maine, 2006

40-Hour HAZWOPER Certification, OSHA, Topsham, Maine, 2009

REGISTRATIONS

Onsite Sewage Disposal System Inspector #523, State of Maine, An Office of the Department of Health and Human Services - Subsurface Wastewater Program

Apprentice Wetland Scientist #WSA-18, New Hampshire Joint Board

Licensed Site Evaluator #386, State of Maine, An Office of the Department of Health and Human Services - Subsurface Wastewater Program

Enviro-Septic Certified #5058MEES, Presby Environmental Inc.

PROFESSIONAL ASSOCIATIONS

Professional Member, Society of Soil Scientists of Southern New England

President, Maine Association of Wetland Scientists

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

Soil Judging Team, The University of Maine

Director, Maine Association of Site Evaluators

Recognized Wetland Delineator, New Brunswick Department of Environment

Member, Association of State Wetland Managers

Member, Maine Association of Professional Soil Scientists

PROJECT EXPERIENCE

Natural Resource Services

Old Port Village Peer Review, Kennebunkport, Maine

Senior Project Manager. Reviewed documents filed by the applicant as they pertained to natural resource impacts associated with a proposed subdivision and the presence or absence of rare, threatened, and endangered (RTE) species that may occur within the proposed project area. Work done on behalf of an abutting property owner to the proposed development.

Penobscot River Restoration Natural Resource, Penobscot County, Maine

Technical Lead. Coordinated and participated in natural resource assessment of three dam impoundments along a 10-mile stretch of the Penobscot and Piscataquis Rivers. Characterized existing ecological resources and collecting existing infrastructure information. Tasks included wetland reconnaissance, site specific delineation and Function Value Assessments along the backwater of all three impoundments. In addition coordination of invasive/exotic plant management and supporting development of ecological changes post removal.

Wind Farm Development Surveys and Risk Assessments, Maine

As Senior Project Manager, Mr. Knapp has managed preconstruction wind farm development surveys and assessments at multiple sites throughout Maine. These assessments include site prospecting for wind farm sites, landscape analyses, fatal flaws, and ecological community characterization.

Hoosac Wind Project, Massachusetts

Field Manager/Senior Project Manager. Conducted a series of wetland delineations in concert with other environmental team members. Field surveys included confirming mapped wetlands and other natural communities and delineating the boundaries of wetlands, streams, and other natural resource features. He also conducted extensive botanical field surveys within the project area to determine if any state- or federal-listed rare plant species were present.

Cabelas Retail Development, Scarborough, Maine

Wetland Scientist. Conducted wetland delineations and vernal pool surveys. Completed a systematic mitigation site search through several counties in suppport of permitting efforts.

Highland Wind, Maine

Senior Project Manager responsible for the organization and management and oversaw the QA/QC of the wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys conducted on an approximately 1,500-acre project area.

Line 56, Maine

Senior Project Manager responsible for organization and management of all natural resource work along more than 50 miles of transmission line corridor.

Maine Power Connection Transmission Corridor, Maine

Senior Project Manager: Dale was responsible for the organization and management and oversaw the QA/QC of the wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys conducted along over 140 miles of existing and proposed power line corridor between Haynesville and Chester, Maine.

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

Grand Manan Wind Farm Phase I, New Brunswick

Senior Project Manager responsible for organization and management of all wetland delineations and impact assessments for a 20 MW wind project covering 250 acres on the island of Grand Manan.

Stetson Wind Farm, Maine

Field Manager and Permitting Support. Responsible for completing natural resource surveys on a 1300-acre project area for this 24 MW wind project. Mr. Knapp functioned as field leader responsible for leading teams of 4-6 person crews. Studies included wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys. Assisted in the completion of required state and Federal permit applications filed in support of the project.

Record Hill Wind Farm, Roxbury, Maine

Senior Project Manager supporting the Record Hill wind project, which is a 22-turbine, 55 MW wind project on a forested ridge environment in the western Maine mountains. This project has included planning and feasibility studies, wetland delineations, wildlife impact studies, noise and visual impact assessments, and coordination of all state and Federal environmental permitting.

Redington Wind Farm, Maine

Field Manager and Permitting Support. Responsible for completing natural resource surveys on a 1700-acre project area. Functioned as field leader responsible for leading teams of 4-6 person crews. Studies included wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys. Assisted in the completion of required State and Federal permit applications filed in support of the project.

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

PUBLICATIONS

Emerson, B., D. Knapp, J.D. DeGraaf, and G. Carpentier. Potential Impacts to Wetland Functions and Values from Dam Removal. *Poster presented at The Diadromous Species Restoration Research Network Science Meeting, University of Maine, Orono, Maine*, 2009.

Karol A. Worden

Wetland Scientist

Ms. Worden is a wildlife biologist and wetlands ecologist who has participated in natural resource investigations throughout the United States. As a field project manager for Stantec, she directs wetland delineations and assessments, coordinates permitting activities, and assists in mitigation design and monitoring. She specializes in providing these services for airport and other transportation projects as well as wind power development sites. She has conducted wetland delineations and vernal pool surveys throughout New England.

Her background also has involved big game, fur-bearer and endangered species research, field surveys in support of risk assessments, and environmental remediation of sites contaminated with petroleum products, lead and PCBs.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Project Manager.
- Woodlot Alternatives, Inc. 1999-2007. Project Manager.
- Coastal Environmental Corporation. 1995-1999. Project Manager and Senior Biologist.
- NH Fish and Game Dept. 1994-1995. Data Compiler.
- ME Dept. of Inland Fisheries & Wildlife. 1993 and 1994. Wildlife Technician.
- University of New Hampshire, Durham. 1990-1992. Research Assistant.

EDUCATION

MS, Wildlife, University of New Hampshire, Durham, New Hampshire, 1992

BS, Wildlife Management, University of Maine, Orono, Maine, 1989

40-hour HAZWOPER Certified, OSHA, Topsham, Maine, 2010

REGISTRATIONS

Certified Wetland Scientist #00153, State of New Hampshire

PROFESSIONAL ASSOCIATIONS

Member, Maine Association of Wetland Scientists

PROJECT EXPERIENCE

Natural Resource Services

Hancock County-Bar Harbor Airport, Trenton, Maine

Project Scientist. Provided assistance with permitting and mitigation design associated with runway safety area upgrade. Work included wetland delineations, GPS surveys, impact assessments, mitigation design, permit preparation and agency consultations.

Interface Fabrics Finishing, East Douglas, Massachusetts

Project Manager/Scientist. Completed wetland delineations on the approximately 97-acre property associated with the Interface Fabrics Finishing mill and prepared a report presenting the results of the delineation and discussing applicable state, federal and local regulations.

Mount Carberry Landfill, Success, New Hampshire

Project Scientist. Completed wetland delineation and vernal pool surveys for an 81-acre expansion of the existing Mount Carberry Landfill. Prepared natural resource reports based upon delineation and survey efforts and assisted with state and federal permitting.

Karol A. Worden

Wetland Scientist

CMP Power Line Upgrades, Saco, Biddeford and Old Orchard Beach, Maine

Project Scientist. Conducted wetland delineation and vernal pool surveys along 15.2 mile power line corridor for proposed upgrade projects. Prepared ecological characterization report summarizing results of delineation and other natural resource surveys.

Record Hill Wind Farm, Roxbury, Maine

Project Scientist. Conducted QA/QC of natural resource reports and map products included in state and federal environmental permits for a proposed 22-turbine wind project in western Maine. Provided permitting support including preparing responses to agency comments.

Highland Wind Project, Highland Plantation, Maine

Project Scientist. Conducted wetland delineations and natural resource surveys within 1,500-acre project area for a proposed wind project in western Maine. Assisted with preparation of natural resources reports based upon delineation efforts and other natural resource surveys and completed QA/QC of natural resource reports and map products. Assisted with preparation of state and federal permit applications.

Redington Wind Farm, Maine

Project Scientist. Conducted wetland delineations within a 1,700-acre project area for a proposed wind project in western Maine. Prepared natural resource reports based upon delineation efforts and other natural resource surveys.

Downeast LNG Ecological Characterization and Permitting, Robbinston, Maine

Project Scientist. Completed wetland delineation of the 47-acre proposed liquefied natural gas port facility and assisted with delineations and vernal pool surveys along prospective 30-mile natural gas pipeline.

Skowhegan Bypass Feasibility Studies, Maine

Project Scientist. Assisted in conducting natural resource investigations along route alternatives surrounding the Town of Skowhegan and crossing the Kennebec River. Studies included botanical and wildlife surveys, wetland mapping and assessments, and rare species surveys. Documentation of resources included an assessment of permitting issues and mitigation requirements, and production of natural resources sections of a NEPA Environmental Assessment.

Wiscasset Municipal Airport, Wiscasset, Maine

Project Manager. Prepared wetland functions and values assessment for taxiway extension project.

Pittsfield Airport Projects, Pittsfield, Maine

Project Manager. Performed wetland evaluations, permitting, mitigation and vegetation management plan development for various projects related to the runway safety area.

Knox County Airport, Maine

Project Scientist. Conducted wetland delineations and mitigation monitoring for runways and taxiways expansion project at this regional airport.

Light Rail Transit Project, New Jersey

Wetland Scientist. Conducted wetland delineations for light rail transit project between Trenton and Camden, New Jersey.

Turnpike Extension Projects, Oklahoma

Wetland Scientist. Conducted wetland delineations for three turnpike extension projects in eastern Oklahoma.

Karol A. Worden

Wetland Scientist

PUBLICATIONS

Worden, K.A., P.J. Pekins. Seasonal change in feed intake, body composition, and metabolic rate of white-tailed deer - Worden, K.A., P.J. Pekins. *Canadian Journal of Zoology, 73: 452-457*, 1995.

Matthew P. Arsenault

Certified Ecologist, Botanist, Project Manager

Mr. Arsenault is a Certified Ecologist and expert Botanist responsible for performing ecological and botanical assessments and characterizations; natural resource inventories including rare, threatened, and endangered species surveys; wetland delineations and function and value assessments; wildlife population surveys; long-term biological monitoring; and water quality monitoring surveys.

Mr. Arsenault has worked on numerous ecological projects, including natural community and rare plant and wildlife survey projects throughout the northeastern and mid-Atlantic United States. These projects have ranged from general reconnaissance observations to quantitative, community- and species-specific surveys. These projects have involved detailed natural community mapping and analysis. He has provided expert witness testimony regarding the findings of various ecological field studies.

Mr. Arsenault has taught many workshops and led field trips on plant identification and ecology. Continuing education and training has included many workshops with the New England Wildflower Society, Josselyn Botanical Society, Maine Association of Wetland Scientists, and Delta Institute of Natural History.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Project Manager.
- Woodlot Alternatives, Inc. 2005-2007. Project Scientist.
- Delorme Mapping. 2004-2005. Map Technician.
- Maine Natural Areas Program. 2003-2004. Assistant Ecologist.
- Shenandoah National Park. 2003. Biological Science Technician (Exotic Survey Crew).
- University of Maine. 2001-2003. Biological Research Assistant

EDUCATION

BS, Botany, summa cum laude honors, University of Maine, Orono, Maine, 2003

Wetland Delineation Methods, University of New Hampshire, Durham, New Hampshire, 2005

10-Hour Construction Safety & Health Certified, OSHA, Topsham, Maine, 2009

40-hour HAZWOPER Certified, OSHA, Topsham, Maine, 2010

Wilderness First Aid Certified, SOLO, Topsham, Maine, 2010

Heartsaver CPR Certified, SOLO, Topsham, Maine, 2010

REGISTRATIONS

Ecologist, Ecological Society of America

PROFESSIONAL ASSOCIATIONS

Survey-approved Botanist, Massachusetts Division of Fisheries & Wildlife, Natural Heritage and Endangered Species Program

Plant Conservation Program Task Force, New England Wildflower Society

Matthew P. Arsenault

Certified Ecologist, Botanist, Project Manager

Member, Maine Natural Areas Program (Botanical Advisory Group)

Member, New England Wildflower Society

Member, New England Botanical Club

Member, Friends of the Maine Herbarium, The University of Maine Herbaria

Member, Josselyn Botanical Society

Recognized Wetland Delineator, New Brunswick Department of Environment

Member, Ecological Society of America

Member, Maine Association of Wetland Scientists

PROJECT EXPERIENCE

Natural Resource Services

Blanding's Turtle Survey, Galloo Island, New York

Project Scientist responsible for performing surveys for Blanding's turtles at a proposed development site. Survey methods included binocular surveys, nesting surveys, and trapping.

Rare Plant Survey, Lower Chichester, Pennsylvania

Lead Project Scientist responsible for performing a rare plant survey and natural community characterization of a proposed development site.

Rare Plant Survey, Londonderry, New Hampshire

Lead Project Scientist responsible for performing a rare plant survey and natural community characterization of a proposed development site.

Moresville Wind Power Project, Delaware County, New York

Lead Project Scientist. Conducted a broad-spectrum survey and characterization of the existing natural resources including natural communities, rare plants, and rare wildlife along an approximately 5-mile ridgeline in south central New York. Provided a detailed report of the results of the field surveys.

Ecological Characterizations, Windham and Westbrook, Maine

Field Manager and Lead Project Scientist. Responsible for leading field surveys including surveys for rare, threatened, and endangered species of plants and wildlife; assessments of existing wildlife habitat values; and mapping of wetland and stream resources. Provided detailed reports of the findings as well as an analysis on the overall landscape value of each parcel and mitigation potential.

Wetland Mitigation Monitoring, Kennebunkport, Maine

Project manager responsible for conducting and coordinating annual wetland monitoring of a created wetland mitigation site in southern Maine. Prepared annual reports that were submitted to state regulatory agencies describing the existing wetland conditions as well as functions and values. Assessments were made regarding the overall success of the wetland mitigation site.

Wetland Delineation and Vernal Pool Survey, Madison, Maine

Project manager responsible for conducting and coordinating field efforts and report preparation for a wetland delineation and subsequent vernal pool survey of an approximately 100-acre parcel.

Blanding's Turtle Survey, Lyman, Maine

Field Manager and Lead Project Scientist. Conducted binocular and meander surveys targeting the state endangered Blanding's turtle at a project site in southwestern Maine. Prepared a detailed report describing the methodology and results of the field surveys.

Matthew P. Arsenault

Certified Ecologist, Botanist, Project Manager

MBTA Greenbush Line Ecological Monitoring, Scituate, Cohasset, and Hingham, Massachusetts

Project Scientist. Conducted annual monitoring of wetlands and vernal pools including quantitative sampling of vegetation, macroinvertebrates, and water quality. Responsible for conducting radio telemetry monitoring of spotted turtles to determine seasonal movement patterns. Conducted regional de novo surveys targeting spotted turtles. Survey methods included binocular surveys, meander surveys, and trapping.

Proposed Transmission Line Natural Resource Identification, Penobscot and Aroostook Counties, Maine

Project Scientist. Completed vernal pool surveys, wetland delineations, and rare plant surveys along over 40 miles of a proposed transmission line corridor in northern Maine. Coordinated with the State agencies regarding potential impacts to several species of rare plants that were identified within the project corridor.

Saddleback Maine Ski Area Expansion, Rangeley and Dallas Plantation, Maine

Field Manager and Lead Project Scientist. Completed landscape analyses and field surveys to identify and characterize the existing natural resources present on Saddleback Mountain in western Maine prior to construction of a proposed development. Provided detailed analyses and expert witness testimony relative to the potential effects of the proposed development on significant natural resources including plants and wildlife and their associated habitats.

Stetson Mountain Wind Power Project, Washington and Penobscot Counties, Maine

Project Scientist. Completed wetland delineations and rare, threatened, and endangered plant surveys of a low elevation ridgeline and over 30 miles of a proposed transmission line associated with a proposed wind power facility.

Commercial Spring Source Biological Monitoring, Southern and Western Maine

Field Manager and Lead Project Scientist. Developed and implemented biological monitoring plans designed to provide long-term monitoring of potential impacts as a result of groundwater withdrawal to significant natural resources including wetland and stream habitats. Field efforts include annual quantitative sampling of wetland and stream habitats as well as identification of rare, threatened, or endangered species of plants and wildlife. Responsible for providing detailed analyses of the potential effects of water withdrawal operations on significant natural resources.

Significant Ecological Resource Evaluations, Moosehead Lake Region, Piscataquis and Somerset Counties, Maine

Field Manager and Lead Project Scientist. Responsible for coordinating and conducting field efforts on over 300,000 acres of forest land in northern Maine. Efforts included completing a landscape analysis focused on identifying areas likely to support significant natural resources including large wetland systems, exemplary natural communities, and rare, threatened, and endangered species of plants and wildlife and their associated habitats. Subsequent field surveys targeted areas to identify and characterize the existing natural resources and their overall landscape significance. Species-specific targeted surveys were conducted for several species of sensitive wildlife including rusty blackbird, Bicknell's thrush, and Clayton's copper butterfly. Conducted detailed analyses and provided expert witness testimony relative to the potential effects of a proposed development and conservation easements on the significant natural resources present within the project area.

Matthew P. Arsenault

Certified Ecologist, Botanist, Project Manager

PUBLICATIONS

Workshop: Carex Identification. *Maine Assocaition of Wetland Scientists*, 2009.

Workshop: Winter Twig Identification. *Stantec Consulting. 2006*, 2008.

Campbell, C.S., R.C. Evans, D.R. Morgan, T.A. Dickinson, and M.P. Arsenault. Phylogeny of subtribe Pyrinae (formerly the Maloideae, Rosaceae): Limited resolution of a complex evolutionary history. *Plant Systematics and Evolution. 266. pp. 119-145*, 2007.

Potter, D., T. Eriksson, R. Evans, S.-H. Oh, J. Smedmark, D. Morgan, M. Kerr, K. Robertson, M. Arsenault, and C. Campbell. Rosaceae phylogeny and classification. *Plant Systematics and Evolution. 266. pp. 5-43*, 2007.

Presentation: Natural Resource Inventories. *Maine Land Trust Conference, Maine Coast Heritage Trust*, 2007.

Presentation: The Genus Galium. *Plant Identification Workshop for Josselyn Botanical Society Annual Meeting*, 2006.

Campbell, C.S, W.A. Wright, M. Cox, T.F. Vining, C.S. Major, M.P. Arsenault. Nuclear ribosomal DNA internal transcribed spacer 1 (ITS1) in Picea (Pinaceace): Sequence divergence and structure. *Molecular Phylogenetics and Evolution, 35: 165-185*, 2005.

Arsenault, M. and A. Haines. Rediscovery of Carex typhina (Cyperaceae) in Maine. *Rhodora, 106:52-54*, 2004.

Presentation: Alpine Ecology. *Appalachian Mountain Club Ridge Runner Program*, 2004.

Arsenault, M. et al. Incongruence between three genomes in phylogenetic studies within Picea (Pinaceae). *Botany 2003 conference, Alabama*, 2003.

Brett C. Hart, P.E.

Project Manager

Engineering, Survey, & Utilities Division

Brett Hart joined the James W. Sewall Company in 1999 offering a strong background in site design and surveying. Mr. Hart brings to Sewall nearly 10 years of experience in site development and permitting, traffic and transportation engineering, roadway and intersection design, and stormwater management. Recently, Brett has been responsible for managing three wind turbine road and site design projects located within the State of Maine.

EDUCATION

B.S., Bio-Resource Engineering Technology, University of Maine, Orono
Traffic and Transportation Engineering Seminar, Northwestern University, Evanston Illinois

PROFESSIONAL LICENSES AND AFFILIATES

Licensed Professional Engineer, Maine #10658
Treasurer, American Council of Engineering Companies of Maine

RELEVANT EXPERIENCE

Record Hill Wind Project, Roxbury, Maine. Project Manager for civil road and site design for a proposed 55-megawatt (MW) wind farm including 22 Clipper C96 2.5-MW wind turbine generators. Responsible for oversight and development of project design plans and Maine Department of Environmental Protection (MDEP) permitting submittals. Review required by MDEP. Permit application pending.

Kibby Wind Power Project, Kibby & Skinner Townships, Maine. Project Manager for civil road and site design for a proposed 132-megawatt (MW) wind farm including 44 Vestas V90 3.0-MW wind turbine generators. Initially responsible for value-engineering existing design to improve project constructability and reduce overall construction costs. Ultimately responsible for oversight and development of new design plans and Land Use Regulation Commission (LURC) permitting submittals for the Owner's revised turbine layout. Review required by LURC. Project is under construction.

198-MW Wind Project, Confidential Client, Maine. Project Manager for civil road and site design for a proposed 198-megawatt (MW) wind farm including 66 wind turbine generators. Responsible for oversight and development of project design plans and Maine Department of Environmental Protection permitting submittals. Review required by MDEP. Permit application pending.

The Widewaters Group, Offsite Mitigation, Bangor, Maine. Project Manager responsible for design of offsite mitigation improvements for approximately one-half mile of Stillwater Avenue. Project included roadway widening, signalization, underdrain system installation, utility relocation, and Right of Way acquisition. Review required by the City of Bangor and the Maine Department of Transportation. Project is complete.

Wal-Mart Real Estate Business Trust, Offsite Mitigation, Bangor, Maine. Senior Consultant to Sewall Project Team responsible for design of offsite mitigation improvements for portions of Stillwater Avenue and Hogan Road. Project included roadway widening, signalization, underdrain system installation, utility relocation, and easement/right of way acquisition. Review required by the City of Bangor and the Maine Department of Transportation. Project is under construction.

First Hartford Realty Corporation, Triangle Center Offsite Mitigation, Bangor, Maine. Project Manager responsible for design of offsite mitigation improvements for portions of Stillwater Avenue. Project included roadway widening, signalization, underdrain system installation, utility relocation, and easement/right of way acquisition. Review required by the City of Bangor and the Maine Department of Transportation. Project is under construction.

Traffic Impact Analysis. Performed numerous traffic impact analyses per municipal ordinance requirements for development projects located throughout the State of Maine.

Traffic Movement Permits. Drafted and contributed to numerous Maine Department of Transportation traffic movement permit application sections 1 through 6 and section 7 for projects located throughout the State of Maine.

Pleasant Point Passamaquoddy Tribe, Pleasant Point, Maine. Development of a 20 year Long Range Transportation Plan for the Passamaquoddy Tribe utilizing Federal Highway Administration guidelines. Review required by the Bureau of Indian Affairs. Project is complete.

Downeast Heritage Center – Downtown Revitalization, Calais, Maine. Site and road reconstruction design for a downtown revitalization museum and community center in conjunction with Lewis & Malm Architecture. Project included site layout, upgrading the stormwater collection system, and road reconstruction for approximately 1,000 feet of Union Street. Review required by the Maine Department of Transportation. Project is complete.

Pleasant Point Passamaquoddy Tribe, Pleasant Point, Maine. Design of a 2.6-mile shared use bicycle/pedestrian path along an abandoned Maine Central Railroad Line. Review required by Maine Department of Transportation. Project is complete.

Pleasant Point Passamaquoddy Tribe, Perry, Maine. Design of a new residential subdivision including a 0.7-mile long road, sewer and water infrastructure, and site layout of 28 housing units. Review required by Bureau of Indian Affairs, Indian Health Services, USDA Rural Development, and the Federal Highway Administration. Project is complete.

Pleasant Point Passamaquoddy Tribe, Perry, Maine. Roadway design for the construction of four residential roads in Pleasant Point, Maine. Project included extensive underdrain and stormwater collection systems. Review required by Bureau of Indian Affairs and the Federal Highway Administration. Portions of the project are complete.

Jodi O'Neal, EI, CPESC
Staff Engineer

Mrs. O'Neal joined the James W. Sewall Company in January of 2007. She has seven 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 several 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 & SkinnerTownships, 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.

ABIGAIL J. KRICH

(607) 227-8100 krich@BoreasRenewables.com Somerville, MA 02143

Education

M.Eng. Cornell University, College of Engineering **Aug 2006**
Electrical and Computer Engineering, Power Systems Focus
Design Project: "A Study of Emissions and Cost Minimization for the New York State Power System"

B.S. Cornell University, College of Engineering & College of Ag. and Life Sciences **May 2004**
Biological and Environmental Engineering, Environmental Option

Experience

President **July 2008 – present**
Boreas Renewables, LLC
Founded Boreas Renewables, LLC to perform renewable energy project development consulting. Core competencies include technical project management of utility scale wind project development and managing interconnection and Forward Capacity Market participation in the New England market.

Senior Project Developer **May 2008 – July 2008**
Project Developer **July 2006 – April 2008**
Tamarack Energy, Inc.
Sole electrical engineer in startup renewable energy project development company focused on utility scale wind and biomass energy. Technical project manager on development of a 50MW and a 150MW wind energy project in the Northeast. Additionally managed interconnection of all company projects with electrical grid and interfaced with energy, capacity, and REC markets.

Independent Consultant **Aug - Dec 2005**
Performed wind resource analysis and wind farm energy production estimates for Massachusetts Technology Collaborative-sponsored community wind program feasibility studies. Located existing data sets, performed data analysis, wrote summary reports for clients.

Electrical/Mechanical Designer **Jan - Jul 2005**
Northern Power Systems, Waitsfield, VT - Distributed generation project engineering group
Projects included electrical design of 400kW photovoltaic system, feasibility studies and data analysis for 100kW-5MW wind projects, and mechanical drafting and plant layout for 1.5MW natural gas CHP project. Performed AutoCAD drafting, NFPA 90 code research, component selection and sizing, and plant layout.

Graduate Intern **Jun - Dec 2004**
National Wind Technology Center, National Renewable Energy Laboratory, Golden, CO
Worked primarily with systems integration group. Analysis of time-of day and seasonal load following requirements imposed by integration of intermittent wind power onto power grid based on historical wind and load data. Modeling of distributed wind systems using VisSim. Paper published.

Project Assistant **2003 - 2004**
Cornell Utilities Department, Ithaca, NY - Cornell wind project
Initiated 10MW Cornell wind farm effort. Did preliminary research, made initial proposal to University administration. Cornell Utilities Department took on project, hired me to assist project manager, but later put project on hold due to community opposition.

Publications

Krich, Abigail. "Wind Energy's Role in the New England Forward Capacity Market." Poster presentation at American Wind Energy Association's WindPower 2008 conference.

Krich, Abigail. "Self Powered Solar Data Logger." Circuit Cellar Magazine. January 2007, Issue 198. pp 12 – 19. (Cover story. Available at www.circuitcellar.com/library/print/0107/Krich198/Krich-198.pdf)

Krich, A., Milligan, M. "Impact of Wind Energy on Hourly Load Following Requirements: An Hourly and Seasonal Analysis." 2005 Preprint. 20 pp. NREL Report No. CP-500-38061. (Presented at American Wind Energy Association's WindPower 2005. http://www.nrel.gov/docs/fy05osti/38061.pdf)

"Operating Experience with Several Energy Efficient Lab Systems" by D Randall Lacey, PE, and Abigail Krich, Cornell University. (Presented at 2002 EPA Labs for the 21st Century conference in Durham, NC. Available at www.labs21century.gov/conf/past/2002/abstracts/a2_lacey.htm)

TERRENCE J. DEWAN, RLA, ASLA

Landscape Architect
Principal

Terry DeWan has over 40 years of professional experience in landscape architecture, visual resource assessment, site planning, design guidelines, community development. His experience includes work with communities, state agencies, private developers, utility companies, and the forest products industry in New England. He has written numerous studies on community planning, visual impacts, recreation planning, water access, and highway corridor redevelopment.

Maine Licensed Landscape Architect #6

EDUCATION

BSLA, State University of New York, School of Environmental Sciences and Forestry, cum laude

PROFESSIONAL EMPLOYMENT

1988-Present	TJD&A, Yarmouth, ME Principal
1977-1988	Mitchell-DeWan Associates Portland, ME Partner
1976-1977	Center for Natural Areas, South Gardiner, Maine Landscape Architect
1973-1976	Moriece and Gary of Maine, Portland, ME Landscape Architect
1971-1973	The Architects Workshop Philadelphia, PA VISTA/Landscape Architect
1969-1970	Rocky Mountain Development Council, Helena, Montana, VISTA Volunteer
1970-1971	Peter G. Rolland and Associates, Rye, NY

PROFESSIONAL AFFILIATIONS

Maine State Board for Licensure of Architects, Landscape Architects, and Interior Designers, 1986-present
American Society of Landscape Architects: Ethics Committee
LAAB: Landscape Architecture Accreditation Board, CLARB representative
Portland Public Arts Committee
Maine Olmsted Alliance Trustee
American Society of Landscape Architects
American Planning Association
Maine Association of Planners
Yarmouth Affordable Housing Alliance
CLARB: Council of Landscape Architects Registration Boards: Landscape Architect Registration Exam writer and grader; Strategic Planning Committee; Cut Score Committee
Congress for the New Urbanism
Instructor, National Council of State Garden Clubs
Instructor, MeSPO Smart Growth Institute

SELECTED PROJECT EXPERIENCE

LANDSCAPE ARCHITECTURE & PLANNING

Town Hill Village Plan, Bar Harbor. A framework for future growth to preserve open space, encourage pedestrian movement, create a more sustainable commercial core, and accommodate new housing.

Dunstan Great American Neighborhood, Scarborough, Maine. A new community of 300 housing units and a neighborhood commercial center on 150 acres.

Kennebec-Chaudière Heritage Corridor. Interpretative and facilities master plan for heritage trail between Popham Beach and Solon, Maine. MDOT.

Scenic Byways Interpretive Sign Parameters. Mountain Counties Heritage, Inc. A design manual for producing high quality interpretive signs for Maine's Scenic Byways.

Route 27 Scenic Byway Corridor Management Plan. Long-term plan for 45 miles of Route 27 between Kingfield and Canada. MDOT.

South End Urban Design Plan. Bath, Maine A long-term improvement plan for the historic community adjacent to BIW.

Preliminary Facilities and Interpretive Media Plan, Kancamagus Scenic Byway. White Mountain National Forest. Demonstration forest, hiking trails, interpretive exhibits, overlooks, outdoor amphitheater.

Route One Improvements Plan, Lincolnville. Maine DOT. Incorporating road improvements, bicycles, and pedestrian facilities along a highly scenic roadway.

Design Guidelines. Raymond; Falmouth (Exit 10, Route One, and Village Center); Brunswick (Cook's Corner); Skowhegan; Freeport (Route One South); Yarmouth; Kittery; Scarborough; NH Route 101A.

Brighton Avenue Study, Portland and Westbrook. A detailed look at ways to improve the visual environment and traffic safety along a major arterial.

Bethel Pathway, Bethel, Maine. A multi-use pathway along the Androscoggin River.

Beth Condon Memorial Pathway, Yarmouth, Maine. A multi-use pathway parallel to Route One, that is a link in the East Coast Greenway.

A Revitalization Plan for Maine Street, Brunswick, Maine.

Shoreway Access Plan, Portland, Maine. Thirty miles of trails linking Portland's waterfronts and neighborhoods.

Interpretive, Access and Facilities Plan, Wells National Estuarine Research Reserve.

Cook's Corner Master Plan, Brunswick, Maine. Town of Brunswick.

Open Space Plan, Falmouth, Maine. Strategies for dealing with change and protecting open space in a rapidly developing community.

Open Space Plan, Scarborough, Maine. A long term plan to preserve open space in Maine's fastest growing community.

Sprague Family Subdivision, Cape Elizabeth, Maine. Long-term plan for up to 40 new homes on 1,500 acres of oceanfront property.

Spring Point Shoreway, South Portland, Maine. A mile-long oceanfront park.

Basin Mills. Model building and recreation planning for Bangor Hydroelectric's proposed dam on the Penobscot River.

VISUAL IMPACT ASSESSMENTS

Windpower Development: Visual Impact Assessments for New England Wind Energy Station, Boundary Mountains, Maine; Redington Wind Farm and Black Nubble Wind Farm; Stetson Mountain I and II; Record Hill Wind, Roxbury, Maine; Pinnacle Wind Force, Mineral County, WV; Peer review of Cape Wind, Nantucket Sound, MA; Advisor to Governor's Committee on Wind Energy Development, Maine.

Maine DEP / Visual Assessment Rules. Consultant to DEP in the formulation of Chapter 315 Regulations: Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses. Served on DEP Task Force for the development of the rules.

St. Lawrence Cement Co., Hudson, NY Evaluation of visual impacts of proposed cement plan in a historic Hudson Valley community for Scenic Hudson, The Olana Partnership, and Hudson Valley Preservation Coalition.

Kingston Waterfront, Kingston, NY. VIA and development of alternative plans for the re-use of 1.5 miles of the Hudson River waterfront for Scenic Hudson.

Mere Point Boat Launch, Brunswick, Maine. VIA and mitigation strategy for a boat launch proposed by Maine Department of Inland Fisheries and Wildlife.

MaineDEP: West Old Town Landfill. Peer review of VIA for an expanded landfill.

MaineDOT: Sears Island. VIA of a proposed cargo port.

MaineDOT: Bath-Woolwich Bridge. Assessment of potential visual impacts to the historic U.S. Custom House in Bath.

Bath Iron Works, Land Level Transfer Facility, Bath, Maine. VIA and mitigation plan for BIW's $250M modernization plan.

Central Maine Power Co. VIA's for multiple transmission lines and substation throughout southern Maine.

Bangor Hydro-Electric. 345 kV Transmission line from Orrington, ME to New Brunswick.

New England Wind Energy Station, Boundary Mountains of Western Maine. Kenetech Windpower, Livermore, California.

MBNA: International Conference Center, Northport, Maine. VIA and mitigation plan for proposed mountaintop facility.

Stiles Road Quarry, Torrington, CT. VIA of a proposed quarry expansion in an historic community in southern Connecticut.

Recreation Plan, Visual Assessment, and Relocation Study for Golden Road, 'Big A' Hydroelectric Facility, Great Northern Paper, Millinocket, Maine.

Recreation, Land Use, and Visual Components for Relicensing of Ripogenus Dam and Penobscot Mills, Great Northern Paper, Millinocket.

AES-Harriman Cove Co-generation Project, Bucksport, Maine. Visual assessment of a coal-fired power plant on Penobscot River.

Visual Mitigation Plan, Hinckley Park Substation. Central Maine Power Company, South Portland.

Conway Route 16 Bypass Project. Visual Assessment, NH Dept. of Transportation, Conway/North Conway, NH

SELECTED PUBLICATIONS

Scenic Assessment Handbook, Maine State Planning Office. 2008.

Royal River Corridor Study. Town of Yarmouth, Maine. With Stantec. 2008.

A Vision for the Moosehead Lake Region. Natural Resources Council of Maine. 2006.

The Greening of Falmouth. Falmouth Conservation Commission. 2006.

Kittery Design Handbook. Kittery Planning Board, with Planning Decisions. 2005.

The Great American Neighborhood, A Guide to Livable Design. With Brian Kent, Evan Richert, and Beth Della Valle**.** Maine State Planning Office. 2004.

The Road to Licensure and Beyond. Council of Landscape Architectural Registration Boards. 1997. Contributor.

Scenic Inventory, Islesboro, North Haven, Vinalhaven, Maine. State Planning Office Critical Areas Program. 1992.

Scenic Inventory, Mainland Sites of Penobscot Bay. With Don Naetzker. State Planning Office. 1990.

SELECTED PRESENTATIONS

Scenic Inventory Training, Maine State Planning Office, 2009.

Halifax Regional Municipality Planning Presentation. 2008.

Healthy Maine Communities:
12 scripted presentations for MDOT to promote walking and walkable communities in Maine.

Great American Neighborhood Design Concepts. Annual Meeting Northern NE Chapter APA, Meredith NH. 2006

Traditional Neighborhood Development in Maine: Friends of Mid-Coast Maine, 2006.

Sharing the Road: Bicycles and Pedestrians. New England Transportation Safety Conference. 2005.

Neighborhood Aesthetics. Maine Neighborhood Conference. 2005.

What Makes for Good Commercial Design. Androscoggin Valley Council of Governments Annual Meeting. *2005*

A View From Above and Below: Subdivisions. Maine Olmsted Alliance, Bowdoin College. 2005.

Working with Commercial Design Standards. Maine Real Estate Development Association. 2005.

Great American Neighborhoods; Commercial Design Guidelines. Green Valley Institute. Mansfield, Connecticut. 2004.

Tools for Community Design and Decision Making. GrowSmart Maine Sprawl Summit. 2004

Healthy Maine Walks, Powerpoint shows of the MDOT. Pro-Bike-ProWalk Conference, Victoria, BC. 2004.

Art into Landscape/Landscape into Art. Landscape and Art: Reflections on Places and Spaces. Maine Olmsted Alliance. Bowdoin College. 2004.

Great Garden Designs for Maine. Annual Meeting Keynote Address. Coastal Maine Botanic Gardens. Boothbay Harbor. 2004.

Graphic Presentation Techniques, Development Density. Smart Growth Institute, Bethel, ME. 2001.

Great American Neighborhood. Smart Growth Workshop, Maine State Planning Office, Brunswick, ME. 2001.

Controlling Strip Development. NH State Planning Office. Concord, NH. 1999.

Photoshop as a Design Tool. American Society of Landscape Architects Annual Meeting. Portland, OR. 1998.

Controlling Strip Development. American Planning Association Annual Meeting. Boston. 1998.

Chattahoochee Riverway Plan. American Society of Landscape Architects Annual Meeting. Atlanta. 1997.

Los Angeles River Plan. American Society of Landscape Architects Annual Meeting. Los Angeles. 1996.

Cleveland Computer Design Charrette. American Society of Landscape Architects Annual Meeting. Cleveland. 1995.

Scenic Assessments Methods along the Maine Coast. 20th Annual Natural Areas Conference, Orono, Maine. 1993. Moderator.

Visual Assessment Standards and Technology Conference: Case Studies in Visual Assessment Techniques. SUNY, Syracuse, New York 1992.

Design, Landscape and Maintenance, Northeast Regional Scenic Byways Conference, Alexandria Bay, NY, 1990.

Scenic Inventories, Maine Coast Scenic Workshop, Maine State Planning Office, Bar Harbor 1990.

Guest Lecturer to Dr. Richard Smardon's graduate seminar in Visual Assessment Methodology, SUNY, Syracuse, NY 1990.

Subdivision Design and Review. Training Seminar and Video, ME Dept. of Economic and Community Development. 1988.

AWARDS AND DISTINCTIONS

Council of Landscape Architects Registration Boards. Presidents Awards.

Boston Society of Landscape Architects

Excellence Award for outstanding professional practitioner.

Merit Award for Planning: 'From the River to the Bay' A Parks, Recreation, and Open Space Plan for Brunswick, Maine.

Merit Award for Landscape Analysis and Planning – Park Planning: Coastal Maine Botanical Gardens, with EDAW.

North American / United Kingdom Stewardship Exchange, Exmoor National Park, North Devon, England.

Maine Association of Planners Awards

Scenic Assessment Handbook
A Guide to Livable Design
Spring Point Shoreway
TV Mini-Series for Planning Boards
Portland Waterfront Walk
Portland Shoreway Access Plan
Falmouth Route One Plan
Scenic Inventory of Penobscot Bay
Brunswick Revitalization Plan.

American Planning Association, NNE Chapter: Outstanding project of the year award:

Kancamagus Scenic Byway Facilities and Interpretive Plan (with White Mountain National Forest).
Knightville-Mill Creek Vision Plan, South Portland
A Guide to Livable Design.

American Society of Landscape Architects Merit Award for Communications:

Los Angeles River Greenway.
Chattahoochee River Greenway, Atlanta.

Vermont Planners Association, Project of the Year Award: Transit Oriented Design Guidelines for Chittenden County.

Curriculum Vitae

EVAN D. RICHERT, AICP

Address: Suite 308, 6 State Street, Bangor, ME 04401; erichert@midmaine.com

Positions Held

Principal, Evan Richert, AICP, Bangor, Maine, 2003 to present. This sole proprietorship specializes in land use, municipal, and regional/landscape-level planning.

Associate Research Professor: Muskie School of Public Service, University of Southern Maine, Portland, Maine, 2002 to 2010. In addition to teaching graduate level land use planning courses, served as principal investigator for two multi-year research and service projects: the Gulf of Maine Census of Marine Life and the Northeast Regional Association of Coastal Ocean Observing Systems.

Director: Maine State Planning Office, Augusta, Maine, 1995 to 2002. The Director is an *ex officio* member of the Governor's Cabinet. Related appointments included:
Chair, Land and Water Resources Council (1995 to 2002)
Chair, Land for Maine's Future Board (1995 to 2002)
Chair, Gulf of Maine Council on the Marine Environment (1996 and 2001)

President: Market Decisions, Inc., South Portland, Maine, a market research and planning consulting company, 1981 to 1995
Planning Director: City of South Portland, Maine, 1977 to 1981
Water Quality Planner: Gr. Portland Council of Governments, Portland, Maine, 1975 to 1977
Assistant to Executive Director: Legislative Commission on the Water Supply Needs of Southeastern New York State, Syracuse, New York, 1973 to 1975

Formal Education

Syracuse University, Master of Regional Planning, 1974
Syracuse University, Bachelor of Arts, Journalism and Political Science (dual degree), 1969

Academic Appointments and Certifications

American Institute of Certified Planners
Adjunct Professor in the Graduate Program for Community Planning and Development, Muskie School of Public Service, University of Southern Maine, 1997 to 2002
Visiting Lecturer in Environmental Affairs, Bowdoin College, Brunswick, Maine, 1990 to 1994

Civic and Professional Activities

Member of Growing Smart Directorate, American Planning Association, 1995 to 2001
Member, Board of Directors, Maine Coast Heritage Trust, 2002 to present
Founding President, Gulf of Maine Ocean Observing System, 1999 to 2009
Member, Ocean Research and Resources Advisory Panel, Ocean Observing Sub-Panel, 2008-2009
Member, U.S. Coastal Global Ocean Observing System Steering Committee, 2001 to 2007

Awards

Visionary Award, Gulf of Maine Council on the Marine Environment, 2008
Environmental Merit Award, EPA New England, 2002
Environmental Award, Natural Resources Council of Maine, 2002
Environmental Award, Maine Audubon Society, 2000
Planner of the Year, No. New England Chapter of the American Planners Association, 2000
Planner of the Year, Maine Association of Planners, 1993 and 2000
Outstanding Contribution to the Public Planning Process, Maine Association of Planners, 1981
Phi Beta Kappa, Syracuse University, 1969

Publications

Richert, E. 1988. *The People of Maine: A Study of Values.* Commission on Maine's Future, Augusta, Maine.

Richert, E. 1990. "Maine's Changing Population and Values," in *Changing Maine*, Richard Barringer, ed. University of Southern Maine, Portland, Maine.

Richert, E., and Nash, B. 1991. "The Maine Reasons for Recycling." *American Demographics*, Vol. 13, No. 2.

Richert, E. 1992. *Comprehensive Planning: A Manual for Maine's Communities*. Maine Department of Economic and Community Development, Augusta, Maine.

Richert, E. 1993. *A Time of Change: Portland Transportation Plan*. City of Portland, Maine.

Richert, E., and Dorta-Fernandez, O. 1996. "Made to Measure." *Planning*, Vol. 62, No. 6.

Richert, E. 1996. "Service-Center Communities: An Urban Policy for Maine?" *Maine Business Indicators*, Vol. XLI, No. 4. University of Southern Maine, Portland, Maine.

Richert, E. 1996. "Electrical Industry Restructuring: From Policy to Implementation." *Maine Policy Review*, Vol. 5, No. 3. Margaret Chase Smith Center for Public Policy, Orono, Maine.

Richert, E. 1997. "Tax Revenue Targeting as the Anchor for Tax Reform." *Maine Policy Review*, Vol. 6, No. 2. Margaret Chase Smith Center for Public Policy, Orono, Maine.

Richert, E., and Lapping, M. 1998. "Ebenezer Howard and the Garden City." *Journal of the American Planning Association*, Vol. 64, No. 2. 1998 Best Feature Honorable Mention.

Richert, E. 2000. *Markets for Traditional Neighborhoods.* Planners' Advisory Service Memo, American Planning Association, June 2000.

Sage, L., Levi, C., and Richert, E. 2001. "Beaming Discoveries of Ocean Frontiers to a Technological Audience." *Marine Technology Society Journal*, Vol. 35, No. 1.
Richert, E. 2001. 30 and 1000: How to Increase Maine's Incomes to the National Average by 2010. Maine State Planning Office, Augusta, Maine.

Richert, E. 2003. "Toward More Efficient and Effective Local Government, New England Style," in Model State Land Use Legislation for New England. New England Environmental Finance Center, Portland, Maine.

Bogden, P., and Richert, E. Fall 2003. “GoMOOS: An Institutional Structure in Support of Regional Marine Research, Operations, and Applications,” *Marine Technology Society Journal.* Vol. 37, No. 3.

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Bruce M. Lockwood
blockwood@portlandresearch.com

Portland Research Group, Inc.

President, Owner, Founder (2000-present)

Celebrating its tenth anniversary, Portland Research Group is one of Northern New England's leading full-service Market Research Consulting Firms. The company conducts local, national and international studies. Current clients include, among others, IBM Corporation (approved vendor), L.L. Bean, Philips Lifeline, Wright Express, Mercy Hospital, Unum, Vermont Department of Tourism Marketing, along with numerous local and national for profit and non-profit private and public organizations.

Portland Research Group is a Corporate Partner of the Portland Symphony Orchestra (PSO) and Friends of the Kotzschmar Organ (FOKO). Portland Research Group was awarded the first annual PSO Corporate Partnership Award.

Member of Portland Regional Chamber of Commerce, Androscoggin County Chamber of Commerce, and the Market Research Association (MRA).

IDEXX Laboratories, Inc.

Market Research Manager (1997-2000)

Located in Westbrook, Maine, IDEXX is the world's largest animal health diagnostic corporation. Refined and formalized market research into a critical strategic decision making tool. Introduced and built the foundation for developing a Customer Relationship Management system to integrate with market research and create powerful customer insight and knowledge. Conducted qualitative and quantitative research worldwide.

Market Decisions, Inc.

Director of Market Research, Partner (1994-1997)

At the time, Maine's leading full service market research firm. Managed a broad range of qualitative and quantitative market research studies. Clients included: People's Heritage Bank, Central Maine Power, Bose Corporation, Microsoft, DECD, and FAME, among others. Conducted preliminary research for the NextGen College Investment Program.

One Union Wharf
Portland, ME 04101-4777
phone 207.874.2077
fax 207.874.2076
portlandresearch.com

Bronner Slosberg Humphrey (now Digitas)

Market Research Manager (1993-1994)
Senior Market Research Analyst (1992-1993)

Conceptualized, designed and managed market research solutions (qualitative and quantitative) for one of the world's largest direct marketing advertising agencies with over $400 million in billings at the time. Raised agency awareness and usage of state of the art market research techniques. Clients included: AT&T, American Express, L.L. Bean and Quaker Oats.

BayBank, Inc. (now Bank of America)

Market Research Officer (1989-1992)

Leading regional retail bank in the Boston area with a 45% primary household bank share. One of the premier financial services marketing firms and the first bank in New England to commit fully to ATMs. Designed and managed consumer research projects including Customer Satisfaction, Market Segmentation, and New Product Development. Member of task force challenged to develop BayBank's marketing database.

Abt Associates, Inc.

Market Research Analyst (1988-1989)
Survey Director (1987-1988)

Very well respected social policy research firm and think tank located in Cambridge, Massachusetts. Managed data collection efforts for market research projects. Primary clients included: BayBank, Blue Cross and Blue Shield plans, John Hancock Insurance, State Street Bank & Trust, and Digital Equipment Corporation.

Temple, Barker & Sloane, Inc. (now Mercer Management)

Market Research Assistant (1986-1987)
Programmer/Analyst (1984-1986)

Managed quantitative market research projects such as Product Development, Market Segmentation, Awareness Testing, and Image. Programmed specialized computer applications. Major clients included: BayBank, Digital Equipment Corporation, Texas Instruments, and Maryland National Bank.

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Education

Babson College, Olin Graduate School of Business
Masters of Business Administration with a concentration in Market Research and Statistical Analysis (1992). Worked for Marks & Spencer as part of the International Management Internship Program.

Boston College, Carroll School of Management
Bachelor of Science with a concentration in Operations Research (1983)
Received Dean's Letter of Commendation.

Community Involvement

- Friends of the Kotzschmar Organ (FOKO) – President of the Board
- Portland Symphony Orchestra – Member of the Marketing Committee
- Babson College – President's Society, Alumni Evaluator for the Douglas Foundation Business Plan Competition
- Appalachian Trail Conservancy (1983 Appalachian Trail Thru-Hiker – end-to-end)
- Appalachian Mountain Club
- Portland Trails
- Cape Elizabeth Land Trust
- Portland Museum of Art
- Maine Historical Society
- Cape Elizabeth School Volunteer
- First Congregational Church, U.C.C., South Portland – Member Meetinghouse Choir, Hymnal Selection Committee

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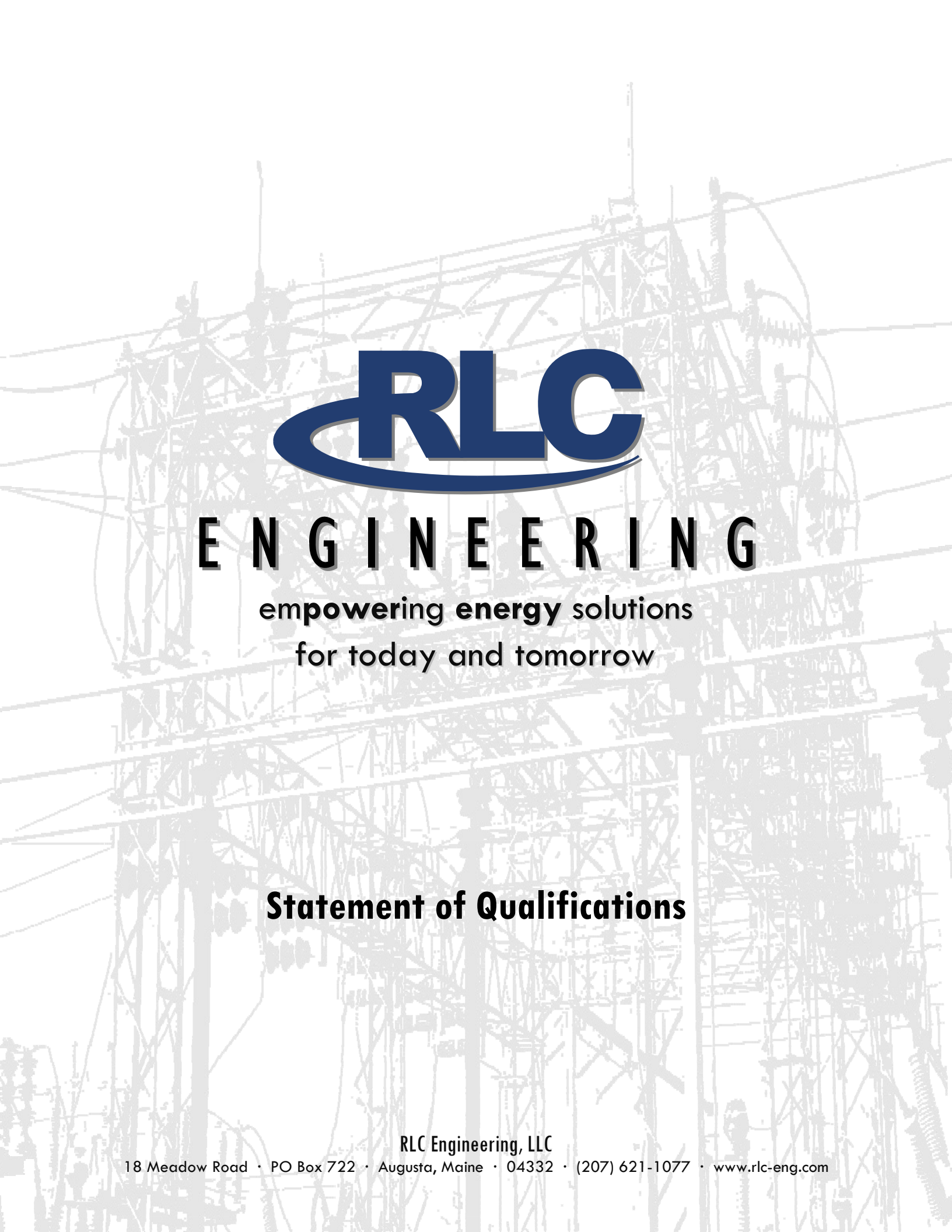


ENGINEERING

empowering energy solutions
for today and tomorrow

Statement of Qualifications

RLC Engineering, LLC
18 Meadow Road · PO Box 722 · Augusta, Maine · 04332 · (207) 621-1077 · www.rlc-eng.com

Table of Contents

Company Profile

RLC Engineering, LLC (RLC) is a Maine consulting firm offering a full range of services in the electric utility engineering field from conception to commissioning. Our mission is to provide expert consulting services and innovative solutions for our clients and to achieve and maintain the highest levels of technical competence and productivity.

With an experienced staff of electrical and civil engineers, RLC offers an exceptional level of competence in a wide range of technical, licensing, and permitting needs. RLC delivers creative, cost effective solutions to our clients. While we provide a broad range of services in the utility markets, we specialize in solving client energy and infrastructure-related problems. Our staff provides a high caliber of expertise on energy-related technical issues at industrial facilities, utilities, power generation plants, and commercial establishments. Our responsive project team knows how to plan, design, and engineer facilities that meet a client's financial, technical, and scheduling goals.

RLC has a staff of 20 technical professionals who routinely work on engineering projects from planning physical plant additions to the implementation or modification of protection and controls.

RLC Engineering personnel can work as a supplement to your in-house staff or provide complete turnkey planning, design, permitting, and project management services for industrial plants, power generation facilities, electrical substations and transmission lines. RLC Engineering delivers measurable results based on your needs and requirements.

With our comprehensive range of services, we can provide complete solutions starting with system planning, site selection and estimating, through detailed design, permitting, and construction management. Whatever your needs, RLC can assist you and provide expert consulting services to meet your schedule and budgetary requirements.

RLC Engineering- em**power**ing energy solutions for today and tomorrow.

Power System Studies

Power System Studies is an integral RLC service offered to support clients in the assessment of power system facility planning and operation. With an experienced staff of Professional Engineers, RLC is able to provide knowledgeable, in-depth analyses related to the electrical grid and its technical requirements. RLC offers analysis and planning of transmission, distribution and industrial power systems. Our staff of well qualified and experienced engineers understands the complex local and regional electrical grid and internal plant issues. We provide assistance and training in areas of power system relaying, conceptual design, planning and operation.

Power system studies conducted by experienced professionals offer the most reliable foundation for effective planning and market assessment. Particularly in the northeast region, timely planning and proper system expansion will help avoid the bottlenecks that could potentially compromise the high standard of reliability expected from the electrical supply system. In order to maintain exceptional reliability and improve access to competitive power sources, the transmission system owner must understand how best to operate and upgrade the transmission network.

Transmission system and power generation resource planning are key components for developing and designing the robust and reliable electric grid needed for the next decade and beyond. The use and access issues require thorough assessment by all the key stakeholders interested in operating and upgrading the regional transmission and distribution systems. RLC's core competency is focused on understanding the complex needs and functions of transmission and distribution owners, large industrial customers, generation developers, and regional transmission system operators.

RLC ENGINEERING

RLC performs transmission and distribution system planning analyses and system impact studies for a variety of customers including large investor-owned utilities, merchant power plant developers and independent system operators. Examples of Power System Studies experience includes:

- Generation System Impact Studies
- System Expansion Studies
- System Modeling and Analysis
- Power Systems Protection Studies
- Transmission System Operating Studies
- Capacitor Bank Switching and Application Studies
- Generator Feasibility Studies

RLC specializes in system planning work in the areas of steady state, stability, short-circuit and transient switching analyses. Other study expertise offered includes:

- Power Systems Computer Modeling and Analyses
- Motor Start Analyses
- Detailed Loss Analyses
- Reactive Compensation Analysis
- Harmonics Analyses
- Generation & Emergency Generation Analyses
- Power Management System Studies
- Evaluation of Power Supply Alternatives
- Transmission Line Protection & Coordination
- Substation Bus & Transformer Protection
- Generation Plant Internal/Intertie Protection & Coordination
- Field Surveys of Electrical Facilities
- Insulation Coordination
- Grounding Analyses
- Switching Surge Studies
- EMF Analyses & Measurements
- Arc Flash Hazard Analysis
- Cable Sizing
- Voltage Drop Studies
- Circuit Breaker Rating Analysis

RLC personnel are competent and knowledgeable users of PSS/E, PSLF, ASPEN, SKM and ATP software analysis tools for power system studies.

ENGINEERING SERVICES

In addition to our Power System Studies capabilities, RLC is an experienced designer of wind farm collectors, interconnection substation, and transmission facilities for power plant and utility service applications. RLC Engineering can facilitate client progress through the conceptual, preliminary and detail design stages as well as through the material procurement, construction and commissioning stages of a project. RLC has the capability and resources to create detailed project designs, develop material procurement and construction services specifications, and to facilitate construction and commissioning of high voltage substations, transmission lines and auxiliary systems. RLC engineers are well qualified and experienced engineers who understand the complex local and regional electrical grid and interconnection requirements of the transmission owner.

RLC engineers have performed interconnection design, construction management and/or commissioning services for a variety of customers including large investor-owned utilities and merchant power plant developers. Recent examples of interconnection design and/or construction experience include:

- Conceptual design of 345 kV interconnection facilities for wind projects - 150 to 300MW
- Conceptual design of 115 & 138 kV interconnection facilities for combined cycle and wind projects
- Detailed design, procurement and construction management of 115 & 138 kV interconnection facilities
- Detailed design, procurement and construction management of medium voltage transmission and collector systems – underground and overhead
- High voltage transmission line design
- Ground grid design
- Equipment specifications (transformers, breakers, insulators, steel, switches, relays, etc.)
- Power one line diagrams
- Protection one line diagrams
- Site plans
- Foundation plans
- Grounding plans & details

- Commissioning plans
- Project scheduling & coordination

RLC personnel are also proficient with AutoCAD2009 and PLSCadd software tools.

POWER PROJECT EXPERIENCE

RLC engineers have significant experience in the design, management, procurement and construction oversight of balance of plant facilities associated with wind projects including collector systems, transmission lines, interconnection facilities, and communication needs). The following is a summary of the wind related projects that RLC engineers have been involved with:

- Nantucket Sound – 462 MW wind project – Transmission Issues
- Reddington Mountain, Me – 90 MW wind project – Preliminary Design of 34.5 kV collector system, 115/34.5 kV collector substation and 115 kV transmission line
- Florida & Monroe, Mass – 30 MW wind project - Preliminary Design of 34.5 kV collector system and 69/34.5 kV collector substation
- Searsburg, Vt– 45 MW wind project- Preliminary Design of 34.5 kV collector system and 69/34.5 kV collector substation
- Sheffield, Vt - 40 MW wind project – Transmission/Interconnection testimony on system impact
- West Cape, PEI – 99 MW wind project – Detailed design and construction management of 34.5 kV collector system and 138/34.5 kV collector substation
- Norway, PEI – 9 MW wind project – Detailed design and construction management of 34.5 kV collector system and 69/34.5 kV collector substation
- Freedom, Me – 4.5 MW wind project – Detailed design and construction management of 34.5 kV collector system 34.5 kV interconnection
- COOS County, NH – 99 MW wind project – Preliminary design of 34.5 kV collector system, 115/34.5 kV collector substation, 115 kV 3 breaker ring bus interconnection substation and 115 kV transmission line
- Vinalhaven Island, Me – 4.5 MW wind project – Detailed design of 12.47 kV collector system and 34.5/12.47 kV Substation upgrade
- Highland Plantation, Me – 156 MW wind project - Preliminary design of 34.5 kV collector system, 115/34.5kV collector substation, and 115 kV transmission line
- Adams, Mass 24 MW wind project – conceptual design of 34.5 kV collection system and Interconnection
- Brodie Mountain, Mass 15 MW wind project – 23 kV Distribution system impact analysis
- Saddleback Mountain, Me 34.5 MW wind project – Conceptual design of 34.5 kV collection system

and interconnection

- Spruce Mountain, Me 18 MW wind project – Conceptual design of 34.5 kV collection system and interconnection
- Canton, Me 51 MW wind project – Conceptual design of 34.5 kV collection system and interconnection
- Rutland, VT 85.5 MW wind project – Conceptual design of 34.5 kV collection system and interconnection
- Moose Mountain, VT 42 MW wind project – Conceptual design of 34.5 kV collection system and interconnection
- Georgia Mountain, VT 12 MW wind project – Conceptual design of 34.5 kV collection system and interconnection
- Wildorado 2 AR, 79.2 MW wind project – Collector system cable sizing and loss analysis
- Walnut Ridge, Ill. – 200 MW wind project - 345 kV Interconnection option assessment
- Taloga, OK – 300 MW wind project – 345 kv & 138 kV transmission interconnection option assessments

OTHER RELEVENT PROJECT EXPERIENCE

The largest and perhaps most relevant project that RLC has been involved with to date is the Maine Power Reliability Program (MPRP). RLC provided the system studies for the 550+ miles of preliminary alternate routes, and the selected routes including report writing and presentation before ISO-NE, Maine Public Utilities Commission and other regulatory stakeholders. RLC has assisted in the preparation of the permit applications for the Maine Department of Environmental Protection as well as other local and state permitting bodies. RLC has also played a significant role in the construction sequence and planning for the MPRP proposed substation and transmission improvements.

In addition to the above activities RLC has performed numerous analyses of the potential MPRP impact on the "other" existing CMP substation facilities. Tasks performed in this effort include:

- Steady State Impacts on existing station equipment bus, breaker and switch configurations.
- Fault Current Impacts on circuit breaker duty ratings, circuit breaker TRV, bus support insulators, disconnect switches, grounding switches, line traps, capacitor banks, and shunt capacitors
- System Impacts on protection relays, shunt capacitor settings, line relay applications, SPS systems, series capacitor, ground relay polarization and out of step stability.

Personnel Profiles

MR. RICKY CONANT, PE

Manager, Power Systems Studies

Mr. Conant has 22 years in the electric utility industry and fourteen years experience managing a technical staff of engineers, programmers, and a support staff of business analysts. He has managed planning studies and conducted operational studies for major transmission equipment outages for electric utilities and independent system operators. In addition, his experience includes:

- Conducting planning studies to develop expansion plans for transmission, sub-transmission, and distribution systems
- Analyzing problems with the system ability to transfer load or generation to transmission and distribution system customers
- Conducting loss evaluations and reliability impacts of different project alternatives to determine preferred solutions
- Directing generation plant operational studies for new plants to assess operating requirements and system transfer capability during normal and contingency operating conditions
- Identifying generating unit restrictions or must-run needs for transmission area reliability
- Performing steady state, dynamic, and transient electric power system studies
- Comprehensive understanding of open access transmission tariffs (OATT) and same-time information system (OASIS)
- Significant involvement in the development and implementation of NEPOOL Operating Procedures (OPs) and Market Rules and Procedures (MRPs) for the electric wholesale energy markets in New England

MR. GEORGE BARTOK, PE

Principal Power System Engineer, Connecticut Office

Mr. Bartok has over 40 years of experience in power system planning, operation, design, and protection, including 20 years managing the protection and controls engineering group in a large New England utility. Grouping this capacity, he was responsible for the specification, development, and implementation of all protection and control systems for transmission and substation facilities as well as all nuclear, fossil, and hydro generating plants. His technical accomplishments include:

- Conducted steady state analyses for the Southwest Connecticut Transmission Expansion Team consisting of representatives from Northeast Utilities, United Illuminating, and ISO-NE

- Performed numerous electrical transient studies in generating stations including motor starting, supply transfer and voltage regulator interaction, as well as complex steady state and transient studies of power system performance
- Developed protection criteria for 345 kV transmission lines and power plant generators
- Developed major electrical equipment protection philosophy
- Performed power system studies and calculations associated with the application of protective relaying systems and dynamic stability
- Established protection and control standards for engineering and design
- Developed alternatives for both transmission and distribution system expansions to provide for load growth and to improve system reliability
- Developed and presented numerous courses on electric system design, operation and protection
- Senior Member of Institute of Electrical and Electronics Engineers
- Appointed to the Accreditation Board for Engineering & Technology (ABET)

MR. DAVID P. ESTEY, P.E.
Principal Electrical Engineer

Mr. Estey is a Licensed Professional Engineer in the State of Maine, State of New Hampshire and the Canadian Province of Prince Edward Island. He offers more than thirty three (33) years of engineering and project management experience in the electric utility industry. Mr Estey is experienced with power facility interconnection design, wind turbine installation, project management and outage planning. He offers excellent oral and written communication skills and is proficient at project economic analysis. He is additionally proficient with PSLF, SKM and PSS/E power system models and possesses a solid understanding of power and control systems, Demand Side Management (DSM), generator interconnection systems, renewable energy resources and electric service rates and issues. His experience includes:

- Designed collector systems and transmission interconnections for proposed wind farms in Canada, Maine, Massachusetts, New Hampshire, New York, Texas and Vermont.
- Designed and managed the balance of plant construction for the Norway (9 MW) and West Cape (99 MW) wind projects on Prince Edward Island; and Beaver Ridge (4.5 MW) wind project in Freedom, Maine.
- Designed multiple 2.5 MVA medium voltage service additions for Procter & Gamble's Tambrands Facility in Auburn, Maine.
- Conducted economic due diligence reviews for Central Maine Power Company on several alternate energy projects.
- Designed 1.7 MW Emergency Power System with automatic transfer for waste water treatment facilities at International Paper's Bucksport mill.
- Performed short circuit, protection coordination and arc flash hazard analysis of plant-wide electrical systems at The Jackson Laboratory, Procter & Gamble's Tambrands Auburn facility and Groveton Paper Board's Groveton facility.

- Performed comprehensive EMF surveys and calculations for proposed power plants in Dighton, Massachusetts; Chelsea, Massachusetts; Johnston, Rhode Island; and Tiverton, Rhode Island; Middletown Connecticut; Yarmouth, Massachusetts; Meriden, Connecticut; Norwalk, Connecticut and testified before both the Connecticut and Massachusetts Facility Siting Council on the issue.
- Served as owner's representative for the Commissioning of Jamaica Private Power Company's (JPPC) 60 Mw diesel power plant in Kingston, Jamaica.
- Performed detailed surge protection analysis for transmission facilities at International Paper Company, AES Londonderry, Public Service of New Hampshire and Meriden.
- Served as Manager of Power System Analysis for TRC Engineers, LLC.
- Served as oversight witness for interconnection relay and trip testing for Central Maine Power Company.
- Served as Project Manager of Androscoggin Energy LLC (AELLC), Rumford Power Associates (RPA), and Bucksport Energy, LLC (BELLC) Merchant Plant Interconnection Projects.
- Managed the Central Maine Power Company's power contracts and joint owner's agreements associated with Maine Yankee, Connecticut Yankee, Vermont Yankee, Yankee Rowe and Millstone Unit 3.
- Served as Director of System Engineering for Central Maine Power responsible for relay and control panel designs for line terminal and transformer panels, procurement specifications for large power transformers, uninterruptable power supplies, battery systems and other electrical components.

MR. NORMAN ST.HILAIRE, P.E.

Principal Civil Engineer

Mr. St.Hilaire is a Licensed Professional Engineer in the State of Maine with more than thirty five (35) years of construction, project management and engineering experience involving electric utility, industrial and commercial projects. Mr. St.Hilaire's experience includes the management and construction of power generation plants, transmission line planning, permitting, and construction, marine facilities, industrial plants including paper mill and cement plant construction, and commercial distribution facilities. He offers excellent oral and written communication skills and is proficient at project scheduling and project management techniques and tools, including Primavera products. His experience includes:

- Current position as Principal Civil Engineer responsible for Project Management and civil design of substation and transmission line projects.
- Nineteen (19) years experience with a large nationally prominent construction firm specializing in power, marine and heavy construction projects. Positions held included Senior Project Engineer, Project Manager, and Corporate Contracts Manager. Projects managed include microchip plant expansion ($60 mm), paper mill machine rebuild ($60mm), large catalog company design/build of new distribution center ($20mm not including equipment), shipyard facility design/build demolition/construction ($20mm), numerous hydropower generation plant construction (12MW, 25 MW) and 115kV transmission line construction.
- Two and one half (2 1/2) years as Contracts Manager, Procurement Manager, Real Estate Manager and Manager of Construction & Procurement Planning for a billion dollar transmission

expansion project from inception through permitting interfacing with all phases of the project team including the engineering, environmental, legal, real estate and planning functions.

- Ten (10) years experience as Construction Manager and Director of Construction Engineering for a large Maine utility. Responsibilities included engineering oversight of the construction of all generation, substation, transmission and commercial facilities.
- Extensive experience managing claim avoidance and disputes activities, including mediation, arbitration, Dispute Review Board and legal proceedings.
- Extensive experience constructing large civil site work, bridge/highway and other power plant facilities.

Software Applications

RLC utilizes the functionality and capability of the following power system software simulation programs and software application tools:

- Siemens/PTI's PSSE Program
- GE's PSLF Program
- ASPEN's Short-circuit Program
- SKM's Power Tools
- Alternative Transients Program ATPDraw

RLC engineers have performed numerous studies using these tools for generator interconnection projects, system expansion studies, equipment design and specifications, transmission and distribution planning studies, and plant protection and coordination studies. The proficient utilization of these software applications allows us to provide in-depth study work of complex problems of any type. In addition, supplemental algorithms have been developed to assist in compiling and interpreting results and to generate clear and concise reports.

RLC employs the flexible and widely used AutoCAD2009 design software to create and amend design drawings for projects. We also employ PLSCadd for transmission line design activities. These systems allow for a readily retrievable and electronically transferable document. RLC is adept at using Microsoft Project and Primavera scheduling software to create project schedules and tract project progress.

RLC has considerable experience using collaborative web based project document control software such as Constructware and Primavera's Contract Manager.

9.0 SERVICES

9.1 Emergency Services

Current emergency services are adequate to meet the needs of the Project. No additional emergency medical services are necessary. If emergency medical services are required during construction, a cellular phone will be used to call 911. Cellular phone service is generally good, and crews working within the Project area will have two-way radios or other secondary communications systems available to them. The emergency dispatcher can connect to Skowhegan's Redington-Fairview General Hospital, which can dispatch LifeFlight of Maine to the Project.

The closest hospitals to the Project are Franklin Memorial Hospital in Farmington and Redington-Fairview General Hospital in Skowhegan, both approximately 35 miles from the Project. Highland Plantation has a contract with Northstar Emergency Medical Services (Northstar) to provide emergency services. NorthStar has five bases including one in Farmington and one in Carrabassett Valley. LifeFlight of Maine has an active base at Carrabassett Valley as well.

Current police and fire services provided to the area are adequate for the Project. The Somerset County Sheriff and Maine Forest Service were consulted, and each has confirmed current services are adequate (Appendix 9-1). Highland Plantation owns four fire trucks, including two tankers and one truck designed to handle brush fires. Highland and Lexington Plantations work together to provide fire protection staffing, which is entirely volunteer. Highland Plantation has a mutual aid agreement with New Portland. Highland Plantation contracts with Somerset County for fire protection in adjoining portions of the unorganized territory. These services will be available to the Project and will be supplemented to the extent necessary with the construction contractor's equipment, employees, and training programs.

The General Contractor selected by the Applicant will be required to demonstrate an extensive safety program as a precondition of Project performance. The safety program will include communications systems throughout the Project, safety and medical emergency training, and drills to address medical, fire, or other safety concerns. Plans will also include ambulance and helicopter evacuations for medical emergencies. In addition, the General Contractor will arrange for training to be provided to construction crews, local fire and EMT services to prepare for any emergencies. The on-site and local emergency response staffs will be specifically trained in first responder and, where appropriate, high elevation rescue procedures.

9.2 Other Services

Solid waste disposal and waste water disposal are addressed under Section 12, Project Description.

Appendix 9-1

STATE OF MAINE
DEPARTMENT OF CONSERVATION
MAINE FOREST SERVICE
2870 NORTH BELFAST AVENUE
AUGUSTA, MAINE 04330

JOHN ELIAS BALDACCI
Governor

PATRICK K. McGOWAN
Commissioner

August 13, 2009

Land Use Regulation Commission
Attn: Marcia Spencer-Famous
22 State House Station
Augusta, ME 04333

Re: Impact of proposed Highland Plantation Wind Project on Local Wildland Fire Protection Services

Dear Ms. Spencer-Famous:

I have reviewed the proposed Highland Plantation wind power development project on Stewart Mountain, Witham Mountain, Bald Mountain, as well as Burnt Hill in Highland Plantation, Somerset County, Maine. The project is being proposed by Highland Wind LLC. The project will consist of 49 wind turbines and associated transmission lines.

I serve as the District Ranger who provides forest fire protection for this area on behalf of the Maine Forest Service. The Maine Forest Service is not a structural fire agency, but we would lend assistance to the level that we are trained and equipped. I have determined, based on my review of the Highland Plantation project and my discussions with their representative, that this project will be reasonably self-sufficient and will have little, if any, impact on the services that we provide to this region. The need for additional wildfire protection services should be minimal and will be consistent with the services currently provided.

With respect to the proposed Highland Plantation wind project, the appropriate wildfire protection services are available and no special circumstances or conditions will be required prior to the provisions of such services.

Please do not hesitate to contact me if you have any questions or concerns.

Sincerely,

Matthew Gomes

Matthew Gomes
District Forest Ranger
Rangeley District
Maine Forest Service

207-864-5545 office
207-624-3700 dispatch

MAINE FOREST SERVICE
Alec Giffen, Director

PHONE: (207) 624-3700 or 1-800-750-9777
FAX: (207) 287-8534
www.maineforestservice.org

SOMERSET COUNTY SHERIFF'S OFFICE

SHERIFF *BARRY A. DELONG*

Chief Deputy *JOHN H. CARROLL*

Marcia Spencer-Famous
110 Foreside Rd.
Cumberland, ME 04110

Dear Ms. Spencer-Famous:

This letter is in regards to the proposed Highland Wind Project in Somerset County. It is our understanding that the proposed project is to begin with an access road of the Long Falls Dam Road to the ridge just west of Witham Mountain. It will follow the ridgelines to Stewart and Bald Mountains, where turbines will be placed. The road will descend into the Sandy Stream Valley and then ascending again to Burnt and Briggs Hills where more turbines will be installed. We understand that there are a total of 49 turbines to be installed.

Overall, we expect that any services that the project will require will be consistent with the services that are currently provided in Somerset County and in the area that the Wind Project is being constructed. This project is likely to have little, if any, need for police services. There do not seem to be any unique safety risks that will need to be addressed and the police services currently provided will be adequate to ensure safety. If the need should arise and our services are required we will be readily available to assist in anyway we can.

The Somerset Sheriff's Office looks forward to working with the Highland Wind Project during the continued development and construction of this Project. If I can be of any further assistance, please do not hesitate to contact me.

Sincerely,

Barry A. DeLong

Sheriff Barry A. DeLong
Somerset County Sheriff's Office

131 EAST MADISON RD • MADISON, MAINE 04950 • (207) 474-9591

Section 10
Construction Schedule/Work Plan

10.0 CONSTRUCTION SCHEDULE/WORK PLAN 10.1

Construction Schedule and Sequence

Construction will commence after all necessary permits and approvals are received. Planning from the December 2010 submission date of this application, the Applicant anticipates a construction start date of late 2011. The Applicant anticipates the Project will be fully operational in late 2012. To the extent feasible, given the constraints of single phase construction, the construction activities will be scheduled to take advantage of the dry season or frozen ground conditions to increase efficiency, avoid unforeseen site related delays, and to minimize potential environmental impacts.

The specific timing of project construction is dependant, to a certain degree, on seasonal conditions, as well as the severity of weather within those seasons. For instance, clearing is most efficient and least environmentally impactful under winter conditions. Conversely, erection of the turbines is most efficient and least environmentally impactful in the summer. The Applicant assembled the following construction schedule with input from an experienced wind farm construction firm to ensure that this application adequately addresses known variables. This firm's knowledge and experience provides the Applicant with an assurance of developing a reasonable and realistic construction schedule to ensure a timely completion of construction activities.

Construction activities are, obviously, influenced by factors other than weather. The start date of construction is influenced by the duration of the permitting process and any appeals or other administrative matters that will affect Project funding, unexpected lead times to purchase materials, and the scheduling of contractor labor are factors that may affect the construction schedule. While some of the proposed development activities can be flexible, the incredible expense involved in the assembly and disassembly of the construction crane required for the Project means construction will happen in a single phase, i.e. – construction activities from component delivery forward are scheduled in a single, uninterrupted phase. This type of phasing allows for orderly and efficient construction practices.

TASK	DURATION
Mobilization	Week 0 – Week 1
Clearing and development corridors marked and erosion control measures installed	Week 2 –Week 6
Clearing	Week 3 – Week 19
Grubbing	Week 4 – Week 24
Blasting as necessary and on-site stockpiling of reusable blasted bedrock	Week 5 – Week 48
Grading	Week 8 – Week 50
Foundations poured	Week 22 – Week 52
Collector lines	Week 36 – Week 64
Component delivery	Week 40 – Week 58
Turbine erection	Week 41 – Week 59
Commissioning and testing of wind turbine generators and electrical interconnections	Week 44 – Week 61
Commence commercial operations	Week 62 – Week 65
Site restoration	Week 40 – Week 85

Details of the civil engineering construction plans (e.g., Plan and Profile sheets) are provided in the separately bound Exhibit 1 to this Application. Details of the electrical plans also can be found in the separately bound Exhibit 2 to this Application.

10.2 In-stream Construction Window

Any in-stream work will occur between July 15 and October 1, as recommended by Maine Department of Inland Fisheries and Wildlife (MDIFW), to minimize impact to stream habitat and inhabitants. To the extent any adjustments in this schedule become necessary, such adjustments will be made in consultation with MDIFW.

10.3 Winter Construction Measures

As previously mentioned, the Applicant's intent is to maximize construction during dry and frozen months; however, in the event that it is necessary to engage in winter or spring construction activities, the recommended winter construction Best Management Practices will be followed. For example, the application of hay mulch at twice the standard rate and installation of a double row of sediment barriers for areas within 75 feet of a wetland may be appropriate. Winter construction specifications are also provided in the project plans (Exhibit 1, Sheet C-4).

10.4 Construction and Post-Construction Monitoring and Reporting

During construction, the General Contractor will inspect erosion control measures at least weekly and after any rainstorm greater than 0.5 inch. The General Contractor will necessarily be certified by the Maine Department of Environmental Protection in erosion control practices. A third-party inspector will conduct periodic inspections under the direct supervision of a licensed Professional Engineer, as described in more detail in Section 10.5 below. Any and all erosion control inspections conducted by the General Contractor or any third-party inspector will be documented in writing. All reports of inspections will be made available to the Land Use Regulation Commission (LURC) upon request.

10.5 Third Party Inspection

LURC requires the Applicant to retain the services of a third-party inspector (the "Inspector") to monitor compliance with LURC permit conditions during construction. The objectives of this requirement are to ensure that:

1) all construction and stabilization activities comply with the permit conditions and LURC-approved drawings and specifications;
2) field decisions regarding erosion control implementation, stormwater system installation, and natural resource protection are based on sound engineering and environmental considerations; and
3) appropriate communication occurs between the contractor and LURC regarding any changes to the development's erosion control plan, stormwater management plan, or final stabilization plan.

This section describes the proposed inspection program and outlines the anticipated responsibilities of the applicant, LURC, and the Inspector. Please note that any contract with a third-party inspector will be structured to allow for stoppages of construction during winter- or other weather-induced shut-downs and will be designed to ensure appropriate stabilization measures are installed and inspected prior to such shut-down events.

10.5.1 Selecting the Inspector

At least 30 days prior to starting any construction activity on-site, the Applicant will submit the names of at least two inspector candidates to LURC staff for consideration. Each candidate will meet the minimum qualifications listed under Section 10.5.2. In addition, the candidates will not be employees, partners, or

contracted consultants involved with the permitting of this project or otherwise employed by the same company or agency. LURC staff will have a reasonable amount of time from receiving the names to select one of the candidates as the inspector, or to reject both candidates. If LURC staff has failed to act within a reasonable amount of time prior to the scheduled beginning of construction, Applicant may use either of the proposed candidates. If LURC staff rejects both candidates, then LURC will state the particular reasons for the rejections. In this case, Applicant may dispute the rejection to the Director of LURC, or start the selection process over by nominating two new candidates.

10.5.2 The Inspector's Qualifications

The Applicant will nominate inspector candidates to LURC possessing the following minimum qualifications:

1) a degree in an environmental science, civil engineering, or other demonstrated expertise;
2) a practical knowledge of erosion control practices and stormwater hydrology;
3) experienced in management or supervision on significant commercial construction projects;
4) the ability to understand and articulate permit conditions to contractors concerning erosion control or stormwater management;
5) the ability to clearly document activities under their direction;
6) appropriate facilities and, if necessary, support staff to carry out the duties and responsibilities set forth in Section 10.5.5 in an efficient and timely manner; and
7) possesses no ownership or financial interest in the development of the Project, other than their contracted role as the provider of third-party inspection services.

10.5.3 Commencement of Inspection Services

The Applicant will not engage or contract for the services of any Inspector under this permit condition until either LURC formally approves the candidate or, in accordance with Section 10.5.1, waives this condition. Unless otherwise authorized by the terms of LURC's permit approval for the Project, no clearing, grubbing, grading, filling, stockpiling, or other construction activity will take place on the development site until LURC has approved the Inspector candidate and Applicant has retained or contracted for inspection services.

10.5.4 Termination of Inspection Services

Without prior written approval from LURC, the Applicant will not terminate the services of the Inspector at any time between the commencement of construction activities and the completion of final site stabilization. In the event the Inspector is terminated in accordance with this section, a replacement inspector will be selected pursuant to the procedures established in Sections 10.5.1 and 10.5.2 above.

10.5.5 Duties and Responsibilities of Inspector

The inspector's work will consist of the following duties and responsibilities:

<u>Prior to the commencement of construction:</u>

1) The Inspector will become familiar with the terms and conditions of any LURC-issued permit governing this Project and other relevant permits, conditions, and restrictions related to the protection of natural resources within the project area.
2) The Inspector will become familiar with any proposed construction schedule, including the dates and durations of the installation and removal of any and all erosion control measures, the timing for the construction of stabilization basins or ponds, and the deadlines for completion of stabilization of disturbed soils.
3) The Inspector will become familiar with plans and specifications governing the Project, and specifically those plans and specifications relating to the construction of detention basins all erosion control measures, and all temporarily or permanent measures necessary to stabilize any and all disturbed soil in a timely manner.

During construction:

4) The Inspector will monitor the installation and maintenance of the erosion control measures called for in the state permit(s) and any additional measures the inspector believes are necessary to prevent sediment discharge to off-site properties or natural resources. This monitoring will be based on the approved erosion control plan, field conditions at the time of construction, and the natural resources potentially impacted by construction activities.
5) The Inspector will monitor construction of all stormwater management controls, including the construction and stabilization of any necessary ditches, culverts, detention basins, water quality treatment measures, and storm sewers.
6) The Inspector will monitor the installation of any stream or wetland crossings and observance of permit conditions or restrictions related to the same.
7) The Inspector will monitor the final stabilization of the project site.
8) The Inspector will keep logs recording rain fall amounts, daily construction activities, discussions or conversations with the contractor(s), and any possible violations of permitted conditions.
9) The Inspector will inspect the Project at least once a week, and before and after any significant rain event. The Inspector will photograph protected natural resources in proximity to construction activities, both before and after construction and will photograph or otherwise document any areas of non-compliance. Photographs will be identified with, at a minimum, the date of the photo, location, and the name of the individual taking the photograph. ***Note: Applicant requests permission for the frequency of these inspections as described in this section to be varied at the third party inspector's discretion to best address the particular project needs.***
10) The Inspector will prepare and submit weekly inspection reports, as defined below, to LURC staff.
11) The Inspector will notify LURC immediately of any significant non-compliance issues.

Post-construction:

12) The Inspector will monitor, on a monthly basis, all stormwater erosion and sedimentation control measures for a period of one year after the Project begins power production.

10.5.6 Inspection Reports

The Inspector will submit weekly written reports to LURC that will include photographs of representative compliance measures and any observed potential violations. The Inspector will prepare its reports using a form provided by LURC. Each report will be submitted by the Friday following the inspection week (Monday through Sunday). The weekly report will summarize construction activities and any reportable events on the site for the previous week as outlined below.

1) The name of the development.
2) The relevant permit number(s).
3) The start and end dates for the relevant inspection week (Monday through Sunday).
4) The date(s) and time(s) when the Inspector was on-site.
5) The date(s) and approximate duration(s) of any rainfall events on the site for the week.
6) Erosion problems arising over the course of the inspection week that resulted in sediment either leaving the project are or being discharged into a natural resource.
7) A description of any actions taken to repair damage to other properties or natural resources, or to eliminate an erosion source, and/or to prevent future sediment discharges from the area.
8) A list of the buildings, roads, turbine pads, detention basins, stream crossings, or other features open to construction for the week, including those areas actively worked and those left unworked (dormant).
9) For each area open to construction, the report will list:
    a. the date of initial soil disturbance for the area;
    b. Which areas were actively worked that week and which were left dormant for the week, with a brief description of the work performed in any actively worked

area, and progress toward final stabilization (e.g., grubbing in the process, grubbing complete, rough grading in progress, rough grading complete, finish grading in progress, finish grading complete, permanent seeding completed, and area fully stable and temporary erosion controls removed); and

c. The erosion and sedimentation control measures installed, maintained, or removed during the week.

10) For each erosion control measure in-place, the report will note the condition of the measure and any maintenance performed to ensure its continued effectiveness.

Please note that additional information regarding erosion and sedimentation control can be located in Section 13 of this Application.

Section 11
Estimated Development Costs

11.0 ESTIMATED DEVELOPMENT COSTS

Development costs are defined under Land Use Regulation Commission (LURC) Rule Chapter 1.02, B as all costs of a proposed project including, without limitation, site preparation, building and road construction, installation of wastewater disposal systems and monitoring and erosion control devices, but shall not include the cost of acquiring the land.

The Applicant is considering different turbine models, and depending on the final selection, the Project costs could range from $210,000,000 to $247,023,000. For the purposes of this application, the Applicant has provided details on the highest anticipated cost, but in terms of the Tangible Benefits projections set forth in Section 21, those calculations were conservatively run with the lowest estimated project costs to ensure that, in no event is the Applicant over-representing the tangible benefits of this Project.

The total project cost is expected to be approximately $247 million, as outlined below:

Project Element	Estimated Costs
Turbines	$152,186,000
Collector System and Generator Lead	$ 22,340,000
Turbine Foundations and Erection	$ 14,503,000
Roads	$ 21,994,000
Development	$ 6,000,000
All other costs	$ 30,000,000
Total	**$247,023,000**

Section 12
Project Description

12.0 PROJECT DESCRIPTION

Highland Wind LLC ("Applicant") is proposing the Highland Wind Project (the "Project"), a 39 wind turbine generating building located in Highland Plantation, Somerset County, Maine. In addition to the wind turbines, the Project includes a 34.5-kilovolt (kV) electrical collector system, an electrical collector substation, a 115-kV generator lead, an Operations and Maintenance (O&M) building, up to five permanent 80-meter meteorological (met) towers, and a series of roads to construct and then access the turbines and related infrastructure. All proposed components will be located in Highland Plantation, with one exception - the generator lead, which delivers power from the electrical collector substation to the New England grid, passes through Pleasant Ridge Plantation.

More specifically, the Project will consist of the following components.

- Thirty-nine turbines, along with associated electrical interconnection infrastructure, installed in two distinct strings. The western string includes the 18 turbines located on the ridgeline that connects the "Watering Tub" (aka the "Elbow", west of Witham Mountain), Witham Mountain, and Bald Mountain. The eastern string includes 21 turbines extending from the northeastern end of Burnt Hill south to Briggs Hill. The met towers will be located in association with the two turbine strings. Turbines will be located at elevations between 1,553 and 2,237 feet above mean sea level, on ridges that rise 1,300 to 1,500 feet above the surrounding valleys.
- Red warning lights will be installed in accordance with Federal Aviation Administration (FAA) guidelines mounted on the top of some of the nacelles and on each of the permanent meteorological towers. The final lighting plan is determined by FAA approval.
- Access will be from the Long Falls Dam Road in Highland Plantation. During construction, a 32-foot wide crane path will provide access along the ridgelines. Approximately half of the width of the ridgeline crane paths will be allowed to re-vegetate after construction.
- An O&M Building, located approximately 450 feet up the access road on the northeast side of Long Falls Dam Road in Highland Plantation.
- An electrical collector system to transfer power from the turbines to the proposed collector substation located northwest of Burnt Hill. These collector lines will be located underground along the ridgelines. The approximately 9.5-mile long, above-ground 115-kV generator lead will be co-located in an expansion of the existing transmission right-of-way for much of its length, and will connect the on-site collector substation to the existing Wyman Dam substation located in Moscow, Maine. From there, power will then be transferred to the Central Maine Power Company (CMP) system and ultimately distributed to the New England grid.

The land on which the turbines, O&M building, and collector substation will be constructed is managed by Wagner Forest Management Ltd. and is used primarily for commercial timber production. Much of the land has been harvested within the past 10 years, or is currently being harvested. Extensive clearing of forestland has occurred throughout the Project area as a result of forest road construction and timber cutting. To the extent practicable, existing roads and forest clearings will be used for the Project. Certain existing roads will need to be widened and/or realigned in some locations to meet minimum road width and maximum slope requirements.

The meteorological data collected on the western ridgeline suggests that weather conditions can be extreme, and that the wind resource is excellent. These conditions can support the use of a "Class I turbine" that can generate significant amounts of renewable energy in these high powered winds. The wind regime found on the eastern ridge is more moderate and thus is relatively comparable to the winds found at other, previously permitted wind power projects in the state such as the Record Hill Wind Project; a project being constructed by the same team pursuing this Project.

This Application presents development scenarios that contemplate the Project using one of a number of different turbines models. Final turbine selection and purchase agreements will not be completed until after the Land Use Regulation Commission (LURC) has acted on this Application. All alternatives, however, will use the same turbine pad and road locations, as set forth in this Application.

This Application specifically sets forth the “most conservative case” (i.e., the largest potential impact) scenario option in each particular area of study. For example, the loudest turbine model has been used as the basis for the sound impact studies, and the tallest longest turbine blades are utilized for the purposes of visual and shadow flicker modeling. The actual project impacts will ultimately be somewhat less in one or more areas, as no one turbine represents the “worst case” turbine characteristics in every category.

12.1 Summary of Project Components

12.1.1 Turbines

As stated above, a total of 39 turbines, along with associated electrical interconnection, will be installed in two distinct strings. The western string of the Project includes the 18 turbines located on the ridgeline that connects the Watering Tub, Witham Mountain, and Bald Mountain. The eastern string includes 21 turbines extending from the northeastern end of Burnt Hill south to Briggs Hill. The Applicant is considering utility-scale turbines designed to best harness the types of high-class winds found in the Project area. These turbines have nameplate capacities between 2.3 megawatts (MW) and 3 MW. Turbines will be located at elevations between 1,552.5 and 2,237.4 feet above mean sea level, on ridges that rise 1,300 to 1,500 feet above the surrounding valleys. All components of the turbine will be painted white.

12.1.1.1 Lighting

Red warning lights will be installed on turbines in accordance with FAA guidelines. The warning lights will be mounted on the top of some of the nacelles and on each of the permanent met towers. The FAA requires that all structures over 200 feet in height, including wind turbines, have obstruction lighting to ensure the safety of air traffic in the area.

The Applicant initially submitted Notices of Proposed Construction or Alteration to FAA on January 8, 2010. On April 8, 2010, the FAA made a Determination of No Hazard to Air Navigation for all Highland Wind structures and required lighting on 27 of the 48 turbines. The Applicant then submitted modifications to FAA on November 10, 2010 to reflect the changes that have been made to the Project design. The Applicant expects to receive official determinations from FAA in February 2011.

The lighting plan conforms to the requirements of FAA Advisory Circulars AC 70/7460-2K, Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, and AC 707460-1 K, Obstruction Marking and Lighting. When turbines are arranged in a line, such as along a ridge, the FAA requires the turbine at either end of the line to have a light. In addition, the turbines that are highest in elevation are required to have lights. Beyond this, additional turbines within the row are required to have lights so that there is no gap greater than half a mile between lights.

Based on these requirements, this plan proposes a single FAA L-864 aviation red-colored, flashing light mounted on roughly half of the 39 turbines in the Project area. The light is required to be placed on top of the nacelle, the housing at the top of the tower that holds the generator, and must be an FAA L-864 aviation red-colored, flashing light. The FAA requires that these red blinking lights be used at night for air traffic visibility. The lights will be synchronized to alternate being on for 1.5 seconds and off for 1.5 seconds. Because the turbines will be painted white, no lighting will be needed on the turbines during the daytime.

These FAA mandated lights must be visible from 360 degrees horizontally around the turbine for air traffic safety from any direction. The beam of light must be at least 2,000 candela, equivalent to approximately seventeen 100-watt light bulbs, when viewed directly at the level of the light. The lights are focused to provide the required level of light intensity at a horizontal angle while directing minimal light at angles below the horizontal. The obstruction lighting appears similar to a flashlight in that it looks very bright when you look directly into the flashlight beam but is quite dim if you look at it from an angle. The Project intends to select lighting that would have the lowest available brightness and visibility to neighbors. In addition, within the Project area, there will be up to five permanent 80-meter met towers installed that will need their own lighting. In addition to turbine lighting necessary for FAA compliance, there will be safety and security

lighting at the Operations and Maintenance building and at the base of turbine tower stairs. These lights will be motion-sensitive or manually controlled and will be designed and installed to conform with Chapter 10.25, F.

12.1.2 Roads

As a result of past and on-going timber management activities, an extensive road system and clearings are present throughout the Project area. To the extent practicable, the Project design capitalizes on this existing network of roads and clearings and proposes to repurpose them for the Project. In some instances, these existing roads will need to be widened or, in some locations, realigned to meet minimum road widths and maximum slope requirements for the development. In areas where roads need to be realigned or shifted, unused portions of former road beds will be allowed to re-vegetate naturally.

Project access will be from Long Falls Dam Road, and a single, continuous access/connector road allows construction and maintenance access to both ridgelines. The entrance to the project from Long Falls Dam Road is proposed to be located in the approximate area of an existing timber hauling road. The existing road will need to be improved to reduce the grade and required turning radii shortly after leaving Long Falls Dam Road. The improvements to the entrance, along with the proposed changed use, trigger the need for an entrance permit from the Maine Department of Transportation (MaineDOT). MaineDOT previously issued a Driveway/Entrance permit (Permit No. 9751) for the project entrance on December 16, 2009. A site visit was performed by MaineDOT as part of the permit process and the entrance was found to meet applicable MaineDOT requirements. Special conditions required for construction, including installation of truck entering signs and trimming of roadside vegetation, are included in the driveway/entrance permit. A final inspection will be performed by MaineDOT to verify compliance with the Driveway/Entrance permit conditions. This access road will follow existing timber management roads for some portion of its length, although these existing roads will need to be widened or otherwise up-graded. The access road will be constructed to a width of 16 feet. However, short sections of access road, primarily around sharp corners, will be constructed as wide as 23 feet to allow turbine component delivery.

Crane paths along the ridgelines will provide access to the individual turbine locations. Crane paths will initially be constructed to a width of approximately 34 feet to allow the erection crane to travel between turbine locations. Roads to provide access to the proposed meteorological towers will be constructed from the ridgeline crane path to the towers. Because the construction and maintenance of the towers can be accomplished with narrower-tracked machinery, these roads will be constructed to a width of 12 feet.

All roads – including access roads, meteorological tower access roads, and the crane paths – will be constructed of gravel or blast rock and many will be elevated to allow the drainage of surface water. In many cases, these roads will exceed 12 percent in grade with a maximum grade of 14 percent. In total, there will be approximately 18.2 miles of roads running along and between the Project ridgelines. Of this total, 15.1 miles will be new roadway. Civil engineering plans depicting road layouts and turbine locations, as well as other components of the Project, are included in Exhibit 1 of this permit application. A CD of the permit application, which is included with the paper copy of the application, also provides electronic versions of all plan sets.

12.1.3 Electrical Collector System

The electrical collector system will transfer power from the turbines to the proposed collector substation located east of Sandy Stream and west of Burnt Hill. These collector lines generally will be located underground along the ridgeline to reduce the Project footprint and to reduce potential line maintenance costs along the exposed ridges. The approximately 9.5-mile long, 115-kV generator lead will connect the on-site collector substation to the existing CMP system near the Wyman Dam substation located in Moscow, Maine. The power will be transferred to the CMP system and ultimately distributed to the New England grid. The vast majority of this line's route is co-located with an existing CMP-owned 115-kV line that travels from the Bigelow substation to Wyman Dam. Details of the Project's electrical system plans are included in Exhibit 1 to this application.

12.1.4 Collector Substation

The Project collector substation will be located east of Sandy Stream along the access/connector road. This substation site will occupy an approximately 33,000 square foot area that will be enclosed by an exclusion fence. Components of the substation will include a 20 x 20 foot control house, three collectors, a transformer, and circuit breakers. The substation will be equipped with motion-sensing security lights similar to that found in residential yards. Lighting, including any lighting required for construction, will comply with the LURC Chapter 10 §10.25, F, 2. Section and Elevation Views and a General Arrangement Plan are provided in Exhibit 1.

12.1.5 Meteorological Towers

This application proposes five potential permanent met tower locations, though met towers will be placed at a maximum of four of these locations. In an effort to be conservative, the Project design addresses stormwater and other impacts from all five locations.

The 80-meter met towers will be tubular steel construction and will each have a set of three guy wires attached to ground anchors. Each tower will be erected on a gravel pad. Line drawings of a typical 80-meter guyed tower, along with construction notes, are attached as Appendix 12-3. As mentioned above, Lighting for the permanent met towers will follow the FAA recommendations for aviation safety.

Access roads to the met towers, as more fully described in §12.1.2, will be constructed branching off the single, continuous access/connector road.

12.1.6 Operations and Maintenance Building

The O&M building, as proposed, will be a single building housing a 3,375-square foot office and the 4,500-square foot warehouse (Refer to Exhibit 1). The O&M building will be constructed on the north side of Long Falls Dam Road and will be accessed from a driveway branching from the principal access road that will service the western side of the Project area. The O&M building site will include a 6,500-square foot gravel parking area with 25 parking spaces, a propane tank, generator, container storage area, water supply well, and septic tank with a standard stone bed septic system. The O&M site will be equipped with motion-sensing security lights similar to that found in residential yards. Lighting will comply with the LURC Chapter 10 §10.25, F, 2.

During operation, a well will be used to provide potable water for the O&M building. The well will be designed to provide sufficient healthful water supply and will not impact nearby surface waters or other well users, in accordance with applicable LURC standards. The Maine Drinking Water Program will be consulted regarding any testing and monitoring requirements for this well.

During operation, the only potential wastewater generation will occur at the proposed O&M building and will consist only of domestic quality wastewater (i.e., toilet, sink, and shower). There will be no commercial or industrial wastewater generation associated with this Project. The Project will be staffed by a maximum of nine employees with wastewater generation expected to be a maximum of 135 gallons/day. When constructed, the sewage disposal system will be sited at a minimum of 100 feet from the water supply well. The proposed design includes a septic tank with a standard stone bed septic system that meets the requirements of the State of Maine Subsurface Wastewater Disposal Rules, 10-144A CMR 241. The proposed septic system will be sited on suitable soils, as classified by the State of Maine Subsurface Wastewater Disposal Rules. The *Wastewater Disposal & Soils Maintenance Building Site* report is provided in Appendix 12-4. This report includes form HHE-200 for the proposed design of the septic system.

12.2 Signs

The Project anticipates a limited need for informational signs and will follow the standards set forth in section 10.2, J of LURC Chapter 10 – Land Use Districts and Standards will be followed. As required by these standards, the Project will seek LURC approval for any sign that does not meet the criteria under 10.27,J,1.

12.3 Setbacks and Dimensional Requirements

12.3.1 Setbacks

The proposed gravel parking lot at the O&M building will be set back approximately 145 feet from the existing treeline along Long Falls Dam Road and the O&M building will be approximately 235 feet from this treeline. The existing gravel access in this area will be abandoned and allowed to naturally re-vegetate, which should provide additional visual buffer. All structures associated with the project will be set back from property lines and public roadways in excess of the requirements of LURC's Section 10.26, D. Section 12: Land Use Regulation Commission Application

Where the design will allow, the Project incorporates a minimum 75-foot buffer around delineated wetlands and streams within the Project area. Some wetlands and streams will be directly impacted by the proposed design, which necessitates encroachments into this buffer. Other wetlands within the Project area that are not directly impacted will not receive the 75-foot buffer (e.g., Wetland 080). See Table 14-1 in Section 14 for stream and wetland impacts and Appendix 14-1 for the locations of delineated wetlands and streams.

There are three Significant Vernal Pools (SVPs) within the Project area. A 250-foot-wide buffer, the equivalent of the critical terrestrial habitat as defined in Maine Natural Resources Protection Act Chapter 335 9-A(1), will be placed around these three vernal pools. Historic anthropogenic activity has altered the critical terrestrial habitat of each pool. Project design requires that some additional disturbance occur within each buffer area, but in each case, the new disturbance will impact less than 25 percent of the critical terrestrial habitat. Impacts within the buffers of these three SVPs are discussed in detail in Section 14.1.2 of this permit application.

A discussion of setbacks related to public safety is found at Section 20 of this permit application.

12.3.2 Dimensional Requirements

The Project meets the minimum lot size requirements of 40,000 square feet for non-residential uses as specified in §10.26, D.

The Project does not front on flowing water, standing body or water or tidal water. Therefore, the minimum shoreline frontage is not applicable.

The Project exceeds the minimum road frontage for non-residential uses with 762 feet of frontage along Long Falls Dam Road.

The Project will not exceed the maximum lot coverage of 30 percent as specified in §10.26, E.

The Project O&M building will not exceed the 100 foot maximum height for buildings used for nonresidential purposes.

12.4 Fill Material and Stump Disposal

12.4.1 Fill Material Disposal

As required by §10.26, F, all imported fill material placed within 250 feet of waterbodies will be free of debris, trash, rubbish or hazardous or toxic materials. No fill used on the Project will contain hazardous or toxic materials.

During construction, topsoil stockpiles will be protected from erosion and sedimentation through implementation of Best Management Practices. This will include encircling down-gradient sides of the stockpiles with silt fencing or erosion control mix berms. Slopes will be left in a roughened condition to help minimize runoff erosion. Following construction, remaining stockpiles will be spread on relatively flat areas such as reclaimed laydown areas and portions of turbine clearings that will be allowed to re-vegetate.

Erosion control mix, primarily comprised of stump grindings and shredded organic material generated during clearing, will be mixed and spread with the topsoil material and allowed to naturally re-vegetate.

It is not anticipated that the project will require disposal of excess fill material off-site. Any excess fill that is generated will be used to partially level and rough grade the numerous laydown areas located adjacent to project roadways. Excess stumps not utilized for erosion control mix material (if any) may be disposed of within the non-structural fill slopes of project roadways as well as within the areas identified as laydown areas. Laydown and temporary storage areas are depicted on the civil plans included in Exhibit 1.

12.4.2 Stump Disposal

In areas of fill around the turbine pads where trees need to be removed, stumps may be left in place and filled over to avoid unnecessary ground disturbance and minimize waste disposal of the grindings. Other stump grindings will be used to make erosion control mix berms, which will be used to augment or substitute for fabric silt fencing. Ultimately, disposal of some stumps and other organic debris may be necessary. If necessary, a single stump dump with a footprint of less than one acre will be constructed in an upland area

The area selected for the dump will be chosen from among the laydown areas shown on the civil plans included in Exhibit 1. In addition, stumps may be disposed of within the non-structural fill slopes of project roadways.

Aside from stumps, overstory vegetation that must be removed for construction will be harvested and removed as merchantable forest products or chipped or flailed on-site. Marketable timber will be removed from the site for sale. Smaller woody debris will be mulched and used as a soil amendment or as an erosion control measure.

12.5 Temporary Construction-Only Facilities

12.5.1 Temporary Laydown Areas and Storage Areas

Temporary clearings for material/equipment laydown will be located along the access/connector road and ridgeline crane paths. While the final selection of laydown areas is typically made by the contractor, the potential material/equipment laydown areas are depicted on the civil plans included in Exhibit 1. To the extent possible existing clearings from timber harvesting activities will be used as laydown areas. The size and shape of the laydown areas will vary depending upon topography and locations of other Project components and protected resources such as wetlands and streams. All areas of temporary clearing will be allowed to re-vegetate following completion of construction and startup of commercial operations.

12.5.2 Temporary Office and Storage Trailers

The specific location of the site for the temporary office and storage trailers and the decision as to the number of trailers are typically the responsibility of the contractor. The Applicant has, however, identified two alternatives that meet the minimum criteria for providing suitably safe, proximate, and secure temporary construction center locations. The Applicant believes that both alternatives have more than adequate space for the necessary temporary office and storage trailers. The first alternative, and the Applicant's preferred location for the temporary construction center, is on the site of the proposed Operations and Maintenance building for the Project. As noted, this is a safe, proximate and secure area for temporary office and storage trailers during construction. Because the Operations and Maintenance building and related facilities, as described in Section 12.1.6 above, will be constructed on the site, there will be no need to re-vegetate the site. The Applicant has also identified an off-site location that has been field investigated. Based on that investigation, that site is also suitable as a temporary location for office and storage trailers. As noted above, the Applicant intends to utilize the O&M building site. The Applicant understands that use of any alternative site must meet LURC standards and would require LURC approval.

During construction, portable toilets will be provided throughout the site. Each of these will be placed more than 100 feet from streams or waterbodies. Portable toilets will be serviced by the contracted provider who will dispose of the wastewater. The Applicant (or its contractors) will supply drinking water for workers with bottled drinking water.

12.5.3 Temporary Concrete Batch Plant

Concrete required for construction will be trucked to the site from local concrete plants, therefore no on- site batch plant is proposed.

12.5.4 Gravel Pits

The vast majority of this aggregate material will come from blasted rock produced during ledge removal operations and will be graded for reuse in accordance with the Project geotechnical specifications. Based on earthwork balance calculations, additional sources of aggregate will not likely be required. However, additional sources of aggregate from gravel pits under control of the Applicant and near the Project site may be utilized in limited areas.

12.5.5 Temporary Crossings of Wetlands

Construction of the electrical components of the Project (collector line and generator lead) will involve temporary wetland fill to allow access for construction vehicles. This will be accomplished using construction mats of either fiberglass composite or timber composition. Construction mats will be adequate to support equipment and to minimize disturbance of wetland soil and vegetation. Where practical, geotextile fabric or other material such as straw will be put in place prior to the deployment of mat to further minimize impacts. These mats will be placed in the wetland using equipment either located in an adjacent upland or on another construction mat located in the wetland. Construction mats will not be put in place by dragging them through the wetland. Similarly, streams will be crossed using temporary bridges made of construction mats. At these temporary bridges, supporting mats will not be placed below the normal high water and will not impact the stream banks. This technique allows water to flow freely under the temporary crossings and limits adverse effects to the streams. Once construction is completed construction mats will be removed from the wetland or stream crossing and the area will be restored. When not in use, construction mats will be stored upland areas.

12.5.6 Temporary Informational Signs

The Applicant intends to use temporary informational signs, and will follow the standards set forth in section 10.27, J of the LURC Chapter 10 – Land Use Districts and Standards. As required by these standards, the Project will seek LURC approval for any sign that does not meet the criteria under 10.27, J, 1.

12.5.7 Control of Fugitive Emissions [Dust]

The Applicant (or its contractors) will supply water for dust abatement on the gravel access roads. Dust abatement water will be drawn from off-site, non-potable water sources, and will not require withdrawals from any ground water source. A 4,000-gallon truck will be used with a maximum of 5 trips per day for a maximum of 20,000 gallons of water withdrawal a day. Note that the off-site water sources may include lake water, but not water from streams or brooks.

12.6 Disposal of Solid Waste Other than Stumps

The Project will generate solid waste consisting of construction debris, packaging material, and associated construction wastes. Any general construction debris associated with the Project, including packing or transportation materials, will be disposed of at appropriately licensed disposal facilities. Included in Appendix 12-5 is a capability letter from Crossroads Landfill in Norridgewock indicating capacity and willingness to take waste generated by the Project. Waste concrete will be incorporated into the sub-base for the proposed roadway and turbine pads. Concrete truck washdown will be contained and prohibited from flowing to waters of the state prior to appropriate treatment.

Following construction, any operational solid waste generated at the site will be collected at a dumpster located adjacent to the O&M building. Such waste will be disposed of at a state-approved landfill or transfer station in conformance with LURC Chapter 10.25, H.

12.7 Spill Prevention, Control and Countermeasure (SPCC) Plan

This Spill Prevention and Discharge Control (SPCC) Plan was prepared for construction activities at the Project. This Plan will serve as the basis for the SPCC Plan to be employed during operations. Prior to commencing commercial operations, an SPCC Plan associated with turbine operation, the O&M building, and the substation will be completed in accordance with Federal Regulations, Title 40 CFR 112, and will be filed with LURC.

12.7.1 Contingency Measures

Preventative Measures:

1. Refueling will be done in designated areas at each site. No refueling will occur within 100 feet of a wetland or stream. Caution will be taken to prevent overflow of fuel. Absorbent pads will be on hand while refueling is taking place.

Emergency Measures:

1. A 20-gallon spill lab pack will be provided on-site.
2. An excavator will be on-site and hand tools will be available to clean up any spills.
3. Absorbent pads will be available on-site and the lab pack will be equipped with a containment boom.
4. A 55-gallon drum will be available on-site to place any used absorbent pads.

12.7.2 Spill and Discharge Control Actions

1. In case of spill, contractor will notify the Maine Department of Environmental (MDEP) Protection Spill Control and the Owner's Representative immediately.
2. The site crew will be prepared to take immediate measures to contain the spill to within the site boundaries.
3. Measures will be taken to stop the source of the spill.
4. If the spill is discharged into the soil, absorbent pads will be used to absorb as much of the spill as possible. The material will be excavated and disposed of in accordance with federal and state regulations.
5. If the spill discharges into the water, the containment boom will be used to contain and absorb the spill. The absorbent material will be disposed of in accordance with applicable federal and state regulations.
6. If the spill is deemed reportable by Federal Regulations, Title 40 CFR 302 and Title 40 CFR 117, and/or human health or the environment is threatened, the contractor will immediately contact the agencies listed in 12.7.3 below.
7. If materials cannot be decontaminated on-site, and if clean-up is required to eliminate traces of the substance spilled or reduce it to an acceptable level, the contractor will be prepared to remove such material. The materials will be properly containerized and disposed of as soon as possible.
8. If required, the contractor will perform any sampling and testing necessary to confirm the area contaminated has been cleaned to an acceptable level. Sampling and analysis will be performed in accordance with federal and state requirements.
9. The contractor will file a written report with the Owners/Owners Representative and the appropriate agencies immediately after clean-up is complete.
10. Emergency contact representatives and numbers are listed below.

12.7.3 Emergency Contact List

Maine DEP Oil Spills	800-482-0777
Maine DEP Local Contact	207-287-7688
Maine Forest Service Fire Contact	207-624-3700
Construction Site Supervisor	TBD
Construction Operations Manager	TBD
Construction Project Manager	TBD
Highland Wind LLC (Owners Rep.) Rob Gardiner	207-272-7228

12.8 Geotechnical Evaluation

Prior to construction, a geotechnical investigation of new road segments and each turbine pad will be completed. A preliminary geotechnical assessment was completed during the site assessment. The results of these investigations will help determine the type of turbine foundation design appropriate for each location. Given the depth-to-bedrock identified during the preliminary assessment, it is likely that rock anchors will be utilized at each turbine location for the Project. If further geotechnical analysis of the integrity of the bedrock discloses that rock anchors are not feasible at any turbine pad, the pad will be constructed with spread foot foundations.

A desktop analysis of the potential for acid rock drainage was completed by Summit Engineering, and a summary of those findings was provided to MDEP. The slivers of Carrabassett formation rocks on the ridge crest were apparently "roof pendants" that sank into the intruding quartz monzonite/granitic magma body that dominates the project area. These slivers are referred to in the literature as a "highly metamorphosed pelitic granofels", which indicates significant thermal and chemical changes to the roof pendants. Although the Carrabassett formation unit Css is mapped in the Carrabassett region generally as a sulfide-bearing, rusty-weathering rock, on Witham and Stewart mountains the intruding magma body (the "Lexington batholith") has metamorphosed the rocks that it intruded to an extremely high grade, with extreme heat and pressure, resulting in a recrystallization and mineralogical change to the original rocks. Iron sulfide (pyrite) in the Css unit would have been altered and the chemical components juggled, with a resultant high-grade metamorphic rock now containing quartz, sillimanite, andalusite, garnet, muscovite, and biotite, and none of the original iron sulfides. The iron would have been remobilized into garnet and biotite during the metamorphic event, and sulfur remobilized and concentrated into volatiles in the magma (gases). As a result, the highly-metamorphosed Carrabassett formation on the ridge should be very stable chemically and not pose a significant metal leaching risk. During blasting and construction, it will be valuable to examine the exposed rock and determine the leaching potential, and utilize appropriate reuse Best Management Practices to avoid acid water leaching issues. Though the integrity of the Carrabassett formation suggests leaching of acidic rock is unlikely, and the extent of the formation within the Project Area is minimal, the Applicant has developed and will implement an acid rock mitigation plan to amend the pH consistent with the acid rock management plan attached hereto as Appendix 12-1.

12.9 Blasting Plan

Blasting operations shall follow all local, state and federal regulations related to transportation and use of explosives.

Pre-Blast Surveys/Notifications
Pre-blast surveys will be offered to all property owners within a 500-foot radius of the blast site. Appropriate notices will be given and appointments arranged for those owners who desire a survey. Results of those surveys will be documented through video or still photographs and appropriate narration or written reports.

Property owners within 500 feet of the blast area will be provided a blasting schedule. The blasting schedule shall contain, at a minimum: (1) Name, address, and a telephone number of the operator; (2) identification of the specific areas in which blasting will take place, (3) dates and time periods when explosives are to be detonated; (4) methods to be used to control access to the blasting areas, and (5) type and patterns of audible warning and all-clear signals to be used before and after blasting.

Blast Monitoring
All blasts will be monitored by a representative who has been properly trained in the setup and use of seismic monitoring equipment. At least one seismograph will be in use at all times. Placement of monitoring equipment will be at the nearest structure to the blast site.

Sequence of Blasting
All blasting operations will be strictly coordinated with all appropriate parties, including the fire department. Emphasis will be on the safe and efficient removal of the rock existing on the Project site without impact to surrounding structures. Blasts will be developed so as to create adequate relief that will minimize ground vibrations and offer the greatest protection possible to the surrounding structures.

Blasting Procedures

1. Blasting operations shall commence after 6:00 AM and cease before 6:00 PM, Monday through Friday.
2. Blasting cannot be conducted at times different from those announced in the blasting schedule except in emergency situations, such as electrical storms or public safety-required unscheduled detonation.
3. Warning and all-clear signals of different character that are audible within a range of one-half mile from the point of the blast shall be given. All persons within the permit area shall be notified of the meaning of the signals through appropriate instructions and signs posted.
4. Access to blasting area shall be regulated to protect the public from the effects of blasting. Access to the blasting area shall be controlled to prevent unauthorized entry before each blast and until the perimeter's authorized representative has determined that no unusual circumstances exist after the blast. Access to and travel in or through the area can then safely resume.
5. Areas in which charged holes are awaiting firing shall be guarded, barricaded, and posted or flagged against unauthorized entry.
6. All stemming shall be minimum as specified using clean, dry 3/8" crushed stone.
7. Blasting mats shall be used as necessary to cover blasts.

Blasting Mats

Blasting mats and backfill will be used to control excessive amounts of rock movement and flyrock when blasting in close proximity to structures. Mats will be placed so as to protect all people and structures and to prevent flyrock from entering a protected natural resource on or surrounding the blast site and property.

Blast Security and Warning Whistles

Each blast will be preceded by a security check of the affected area and then a series of warning whistles. Communications will be made with job site supervisors and local officials as required to ensure the safest possible operation. All personnel in the vicinity closest to the blast area will be warned. The warning whistles will be as follows.

- 3 Whistles – 5 Minutes to Blast
- 2 Whistles – 1 Minute to Blast
- 1 Whistle – All Clear

The blast site will be examined by the blaster prior to the all clear signal to determine that it is safe to resume work. No blast will be fired until the area has been secured and determined safe.

Explosives

All explosives will be delivered to the job site on a daily basis. There will be no overnight storage. Only the amount of explosives required to perform the day's work will be brought to the site. All explosives will be stored in approved magazines when not in use.

Blasting Personnel

All blasting operations shall be conducted by experienced, trained and competent persons who understand the hazards involved. Persons working with explosive materials shall:

1. have demonstrated a knowledge of, and willingness to comply with, safety and security requirements;
2. be capable of using mature judgment in all situations; and
3. be of good physical condition and not addicted to intoxicants, narcotics, or other similar types of drugs.

In addition, the person(s) responsible for the explosives shall possess current knowledge of the local, state and federal laws and regulations applicable to his work and shall have obtained a Certificate of Competency or a license as required by state law.

Licenses and Permits

Blasting operations will be performed by a blaster who is fully licensed and insured for the transportation, use, and handling of explosives. Blasting permits will be applied for as required from local authorities.

Blast Vibration

Blast vibration will be monitored at the blast site, typically at the structure(s) closest to the blast site. Vibration limits will closely follow limits described in state regulations. Blast designs will be modified as required to stay within the guidelines. Blasting operations will be modified accordingly when approaching buildings and utilities.

12.10 Cut and Fill

The Project plans takes advantage of the existing topography at each turbine location and, where possible, utilize existing roads to reduce overall cut and fill. However, the Project will require use of aggregate material for improvement of the existing logging roads and construction of new access roads and crane paths. A total of approximately 3.1 miles of existing logging roads are being rebuilt, and approximately 15.1 miles of new roadway are being constructed. In addition, turbine sites must be graded to approximately level with no more than three percent cross slope. Table 12-1 below outlines the cut and fill requirements for the different portions of the Project. Roadway construction along with the 39 turbine pads results in the earthwork volumes listed below.

Table 12-1: Cut and Fill Calculations

Project Section	**Cut (Cubic Yards)**	**Fill (Cubic Yards)**	**Net (Cubic Yards)**	
Access & Connector Roads	93,700	87,800	5,900	cut
Stewart, Witham, & Bald Mtns (West)	701,200	626,000	75,200	cut
Burnt & Briggs Hills (East)	723,100	725,100	2,000	fill
Total	**1,518,000**	**1,438,900**	**79,100***	**cut**

* Although the volume calculations indicate the project will generate excess material, we do not anticipate the need to dispose of material off site. As depicted in the civil design plans, nearly all cut slopes are designed to a slope of 2H:1V (2' horizontal to 1' vertical). This is required as exact depths to solid rock have not been determined along all project roadways and soil slopes typically are no steeper than 2H:1V. However, based upon the preliminary geotechnical findings, solid rock is present at shallow depths throughout most of the project area. Excavation within solid rock does not require slopes to be 2H:1V and therefore will likely be steeper in some locations. Steeper excavation slopes will reduce the total project cut volume thereby minimizing or eliminating the need to import or export material from the project site.

These calculations are based on the following assumptions.

- Competent rock material will generally be found within five feet of existing grade (based on preliminary geotechnical investigation).
- The Project site is suitable for rock anchor type foundations.
- Blast rock material will be reused on-site as roadway and turbine clearing fill material.
- Grubbings (i.e., duff layer and top layer of soil that is heavy with organics) will be stockpiled on-site and reused in areas to promote re-vegetation and provide final stabilization. Stump grindings and duff material generated from grubbing will be utilized as erosion control mix while top soil will likely be spread in areas with gradual slopes such as turbine pads and temporary laydown areas.
- The existing access roads are logging roads that are in generally good condition. These roads will be topped and stabilized with blast rock material generated from Project grading work, as necessary Re-grading will be minimized to the greatest extent practicable and will be done only as necessary to remove irregularities that could potentially cause issues with the turbine delivery vehicles and to improve any stormwater concerns.
- The majority of Project cut and fill slopes have been graded at 2H:1V. It is assumed that suitable blast rock material will be available for fill slopes and slope stabilization. In a few select areas, fill slopes as steep as 1.5:1 have been used to prevent abnormally long fill extensions. These 1.5:1 slopes will be stabilized with rip rap or appropriate blast rock. Cut slopes may be as steep as 1H:4V should competent rock be encountered.

The vast majority of this aggregate material will come from blasted rock produced during ledge removal operations and will be graded for reuse in accordance with the Project geotechnical specifications. Based on earthwork balance calculations, additional sources of aggregate will not likely be required. However, additional sources of aggregate from gravel pits under control of the applicant and near the Project site may be utilized in isolated areas of construction.

12.11 Clearing

The Project will require clearing a portion of the lower slopes of Stewart, and portions of the Witham, and Bald Mountain ridgeline, as well as the Burnt and Briggs hills ridgeline for construction of the wind turbine sites and connector roads. The Project site is comprised of actively managed forest operations with ongoing timber harvesting activities. As a result, clearing activities on these mountains will not be as extensive as what likely would be required in otherwise unmanaged forest areas.

Clearing will involve a mix of temporary and permanent impacts. Appropriate erosion control methods will be implemented prior to commencement of clearing operations. Stormwater buffer areas, as described in Section 13.3, will be maintained and will remain undisturbed. Construction of wind turbines and permanent access roads will require permanent clearing. Electrical collector lines also will require clearing for construction. Vegetation in these corridors will be allowed to reestablish, but will be maintained periodically by cutting and tree removal to protect the electrical lines, as described in Section 18 of this Application.

In addition, the construction process will require temporary clearing in locations such as the turbine rotor assembly areas and material/equipment laydown areas. These temporary clearings will be allowed to re-vegetate following completion of construction and startup of commercial operations. Table 12-2 summarizes the clearing impacts associated with this project. .

Table 12-2: Summary of clearing area by Project component. To determine total clearing area temporary and permanent clearing areas must be added together. Permanent clearing total includes roads leading to met tower sites, but not the met tower clearings themselves. Electrical corridor clearing represents conversion rather than permanent clearing.

Project Component	Temporary Clearing Area (Acres [Square Feet])	Permanent Clearing Area (Acres [Square Feet])
Turbine Pads	92.0 [4,008,914]	7.4 [322,780]
New/Improved Roads West	63.1 [2,747,475]	10.6 [463,043]
New/Improved Roads East	50.4 [2,196,163]	12.6 [547,114]
Access Road	51.2 [2,230,587]	9.6 [417,305]
O&M Building and Collector Substation	N/A	2.6 [113,691]
Temporary Laydown Areas	13.4 [584,203]	N/A
Electrical Corridors not associated with roads: Collector Line and Generator Lead	N/A	109 [4,754,647]
Total	270.1 [11,767,342]	151.8 [6,618,580]

General descriptions of the clearing required in each portion of the development area are provided below in Section 12.11.1. A breakdown of impacts by mapped LURC subdistrict is provided in Table 12-3. Proposed clearing limits are shown on the civil engineering plans for the project (Exhibit 1) and are depicted by the darker of the two treeline symbols.

Table 12-3: Impacts by mapped LURC subdistrict based upon total clearing area, temporary and permanent.

LURC Subdistrict	Area (acres)
Flood Prone Protection (P-FP)	4.7
Shoreland Protection (P-SL1)	0.1
Shoreland Protection (P-SL2)	10.3
Wetland Protection (P-WL1)	0.1
Wetland Protection (P-WL2)	0.3
Wetland Protection (P-WL3)	0.4
General Management (M-GN)	406.0
Total	421.9

12.11.1 Clearing Areas

12.11.1.1 Turbine Clearings

In general, circular turbine pads are proposed. Some turbine pads are irregularly shaped in order to minimize particular resource impacts and/or to avoid severe terrain. The size of each pad is determined principally by the minimum area, as determined by turbine manufacturer, to allow for efficient erection of the turbine. The proposed clearing for each circular turbine pad site has a diameter of 332 feet. Because of existing grades, some additional clearing around each turbine site will also be required to allow for site grading and leveling, as necessary. The average circular clearing area is approximately 2.6 acres per turbine site, including an average analysis of site grading clearing. The total clearing, temporary and permanent, for all turbine sites combined based on the average clearing per turbine is approximately 99.4 acres.

Following completion of construction and startup of commercial operations, approximately 2.4 acres of the total 2.6-acre average clearing for each turbine pad will be allowed to re-vegetate. The only portions of each turbine site that will remain permanently cleared include an approximately 0.19-acre area consisting of a 20-foot radius circular area around the tower, a portion of the gravel crane pad, and a 12- foot wide access drive. The total permanent clearing for all turbines sites combined based on the average permanent clearing per turbine is 7.4 acres.

The crane used to assemble the turbine rotors, erect the tower section and lift the nacelles and rotor assemblies onto the towers is too large to be transported to the Project site in one piece. This crane, which is in excess of 400 tons in size, will be delivered in component sections and assembled on-site within the turbine pad clearings and/or along the crane path.

12.11.1.2 Road Clearings

The total length of road to be utilized for this Project is approximately 18.2 miles. This will include 6.6 miles of access road and 11.6 miles of 34-foot wide crane path. The access road, which will provide access to the Project area from Long Falls Dam Road, will have an approximately 16 foot wide travel surface. The crane path will have an approximately 34-foot wide travel surface that will allow the construction crane to travel between turbine sites.

The access road will include approximately 3.1 miles (46 percent) of existing logging roads (see the Civil Design at Exhibit 1). These existing logging roads have an average cleared width of 50 feet. Approximately 25 feet of additional clearing will be required to accommodate the 16-foot wide access road, particularly in areas with proposed roadside collector lines. Proposed access roads have an average clearing width of 70 feet, and an average clearing width of 100 feet with proposed roadside overhead electrical lines. As noted above in Section 12.1.2, the width of clearing necessary to provide access to the permanent met towers will be narrower than what is required for the typical access road.

The average clearing width required for construction of the crane path is 95 feet. This clearing width includes the 34-foot wide road, associated stormwater ditching, and grading of side slopes.

12.11.1.3 Temporary Laydown Areas

A total of approximately 19.0 acres of temporary equipment/material lay down areas have been designated for use along the access roads and crane paths. This includes 5.6 acres of existing clearing and 13.4 acres of proposed clearing. These areas will be used frequently during project construction, but will be allowed to re-vegetate following completion of construction activities. The proposed locations of these laydown areas are shown on the civil plans included in Exhibit 1.

12.11.1.4 Electrical Collector Lines

The 34.5-kV overhead electrical collector line will be constructed to interconnect the Project's 39 turbines. Portions of the 34.5-kV overhead line are designed to be installed along the roadside and any necessary clearing has been addressed under road clearings. In addition, there is one overland segment of the 34.5-kV measuring approximately 1,800 feet in length. This overland line has a required clearing width of 100 feet. Approximately 100 feet from both sides of stream crossings, the clearing width will be reduced to 40 feet for the single circuit lines and 50 feet for the double circuit line to reduce impacts within the stream buffer. In addition to the 34.5-kV collector lines, there will be a 115-kV overhead generator lead line built from the Project collector substation to the existing CMP Wyman Hydro Substation requiring clearing to a width of 100 feet. Additional "danger" trees that pose a potential risk to the electrical infrastructure also will be removed. The estimated clearing required for construction of all overhead electrical lines is 109 acres, which includes approximately 6.5 acres of clearing in forested wetlands.

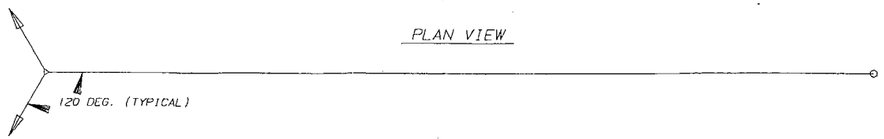
12.12 Civil Plans

Civil engineering plans are broken into the following sections, and can be located in Exhibit 1 to this application:

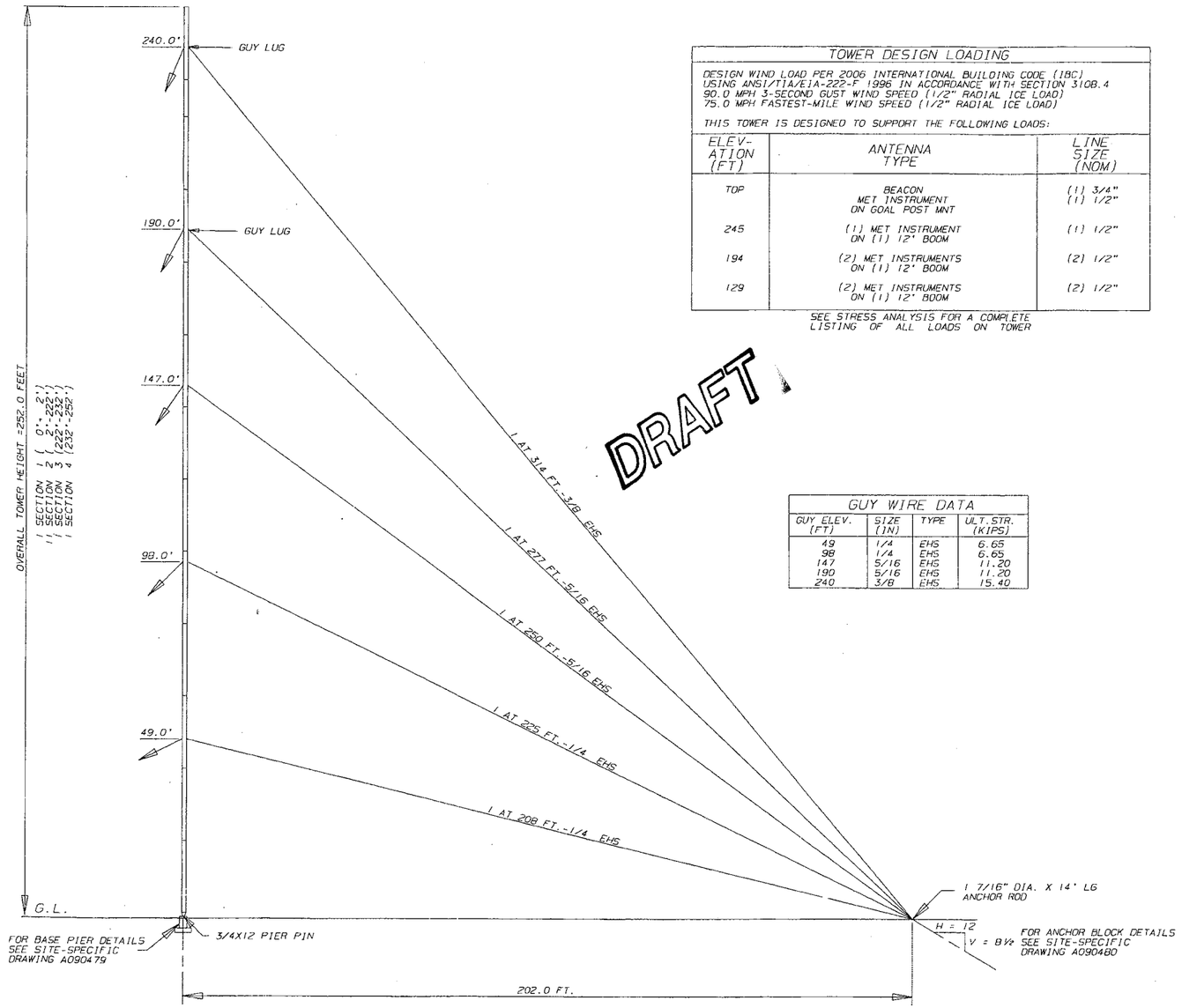
- Cover Series: Cover sheet, overall plan index, O& M building site plan, and detail sheets including typical road way cross-sections, bridge details, and sedimentation and erosion control 'toolbox' details. Sheet C-1 of this series provides a basic legend for the plans including a key to the various hatch types depicted on the plans (ex. Phosphorous Restriction Areas are gray shaded).
- 100 Series: Civil design of the access road leading from the Long Falls Dam Road to the west ridgeline, as well as the connector road leading from the west ridgeline to the east ridgeline. Plans include roadway alignments, plan and profile information, grading extents, and clearing extents.
- 200 Series: Civil design of crane path and turbine pads for turbines 1W through 18W on the western ridgeline. Plans include roadway alignments, plan and profile information, pad layout, grading extents, and clearing extents.
- 300 Series: Civil design of crane paths and turbine pads for turbines 19E through 39E on the eastern ridgeline. Plans include road way alignments, plan and profile information, pad layout, grading extents, and clearing extents.
- 400 Series: Stormwater plans of the access and connector roads. Plans include phosphorous restriction area, stormwater buffers, ditch turnouts, and sedimentation and erosion control measures.
- 500 Series: Stormwater plans of the western turbine pads and crane paths. Plans include phosphorous restriction area, stormwater buffers, ditch turnouts, and sedimentation and erosion control measures.
- 600 Series: Stormwater plans of the eastern turbine pads and crane paths. Plans include phosphorous restriction areas, stormwater buffers, ditch turnouts, and sedimentation and erosion control measures.
- 700 Series: Pre- and post-development storm water plans. Plans include watershed boundaries, project drainage paths (Tc lines), and sub catchment areas (referenced in the HydroCad report included in Appendix 13-2).

Appendix 12-1
Line Drawing of Met Tower

PLAN VIEW



ELEVATION VIEW



DRAFT

TOWER DESIGN LOADING

DESIGN WIND LOAD PER 2006 INTERNATIONAL BUILDING CODE (IBC)
USING ANSI/TIA/EIA-222-F 1996 IN ACCORDANCE WITH SECTION 3108.4
90.0 MPH 3-SECOND GUST WIND SPEED (1/2" RADIAL ICE LOAD)
75.0 MPH FASTEST-MILE WIND SPEED (1/2" RADIAL ICE LOAD)

THIS TOWER IS DESIGNED TO SUPPORT THE FOLLOWING LOADS:

ELEV-ATION (FT)	ANTENNA TYPE	LINE SIZE (NOM.)
TOP	BEACON MET INSTRUMENT ON GOAL POST MNT	(1) 3/4" (1) 1/2"
245	(1) MET INSTRUMENT ON (1) 12' BOOM	(1) 1/2"
194	(2) MET INSTRUMENTS ON (1) 12' BOOM	(2) 1/2"
129	(2) MET INSTRUMENTS ON (1) 12' BOOM	(2) 1/2"

SEE STRESS ANALYSIS FOR A COMPLETE LISTING OF ALL LOADS ON TOWER

GUY WIRE DATA

GUY ELEV. (FT)	SIZE (IN)	TYPE	ULT.STR. (KIPS)
49	1/4	EHS	6.65
98	1/4	EHS	6.65
147	5/16	EHS	11.20
190	5/16	EHS	11.20
240	3/8	EHS	15.40

REACTIONS

AT	VERT. (+↓)	HORIZ. (+→)
BASE=0.0 FT	34.9 KIPS	N/A
202.0 FT	-11.8 KIPS	16.6 KIPS

SECTION MEMBER SCHEDULE

ELEVATION (FT)	SECTION	LEG SIZE	LEG BOLTED FLANGE CONNECTION NO.	LEG BOLTED FLANGE CONNECTION SIZE	BRACE SIZE	BRACE END CONNECTION
0 - 2	1	-	-	------	----------	------
2 - 222	2	1.250 SOLID	4	1/2	0.4375 SOLID	WELDED
222 - 232	3	1.250 SOLID	4	1/2	0.4375 SOLID	WELDED
232 - 252	4	1.250 SOLID	4	1/2	0.4375 SOLID	WELDED

NOTE: SECTION NUMBERS ARE FOR REFERENCE ONLY.
ALL SECTIONS ARE SINGLE BRACED
BRACING PATTERN: TENSION COMPRESSION SYSTEM WITH 1'-3 3/4" NOMINAL PANEL SPACING.
FACE WIDTH = 1'-4 3/4"

GENERAL NOTES

1. ROHN COMMUNICATION TOWER DESIGNS CONFORM TO ANSI/TIA/EIA-222-F UNLESS OTHERWISE SPECIFIED UNDER TOWER DESIGN LOADING.
2. THE DESIGN LOADING CRITERIA INDICATED HAS BEEN PROVIDED TO ROHN. THE DESIGN LOADING CRITERIA HAS BEEN ASSUMED TO BE BASED ON SITE-SPECIFIC DATA IN ACCORDANCE WITH ANSI/TIA/EIA-222-F AND MUST BE VERIFIED BY OTHERS PRIOR TO INSTALLATION.
3. MET INSTRUMENTS, MOUNTS, AND LINES LISTED IN TOWER DESIGN LOADING TABLE ARE PROVIDED BY OTHERS UNLESS OTHERWISE SPECIFIED.
4. TOWER MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE TOWER.
5. WORK SHALL BE IN ACCORDANCE WITH ANSI/TIA/EIA-222-F, "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
6. THE MINIMUM YIELD STRENGTH OF STRUCTURAL STEEL MEMBERS SHALL BE 50 KSI, EXCEPT AS NOTED BELOW.
   SOLID BRACES SHALL BE 36 KSI.
   STRUCTURAL PLATES SHALL BE 36 KSI.
7. FIELD CONNECTIONS SHALL BE BOLTED. NO FIELD WELDS SHALL BE ALLOWED.
8. STRUCTURAL BOLTS SHALL CONFORM TO ASTM A-325, EXCEPT WHERE NOTED.
9. PAL NUTS SHALL BE PROVIDED FOR ALL TOWER BOLTS.
10. STRUCTURAL STEEL AND CONNECTION BOLTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, IN ACCORDANCE WITH ANSI/TIA/EIA-222-F.
11. ALL HIGH STRENGTH BOLTS ARE TO BE TIGHTENED TO A "SNUGTIGHT CONDITION AS DEFINED IN THE NOVEMBER 13, 1985, AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".
12. PURCHASER SHALL VERIFY THE INSTALLATION IS IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS FOR OBSTRUCTION MARKING AND LIGHTING.
13. TOLERANCE ON TOWER STEEL HEIGHT IS EQUAL TO PLUS 1% OR MINUS 1/2%.
14. DESIGN ASSUMES THAT, AS A MINIMUM, MAINTENANCE AND INSPECTION WILL BE PERFORMED OVER THE LIFE OF THE STRUCTURE IN ACCORDANCE WITH ANSI/TIA/EIA-222-F.
15. DESIGN ASSUMES LEVEL GRADE AT TOWER SITE.
16. INITIAL TENSION OF GUY WIRES SHALL BE 10% OF THEIR ULTIMATE STRENGTHS.
17. THE FACTOR OF SAFETY OF GUYS AND THEIR CONNECTIONS SHALL NOT BE LESS THAN 2.0.
18. IT SHALL BE THE RESPONSIBILITY OF THE ERECTOR TO TEMPORARILY GUY THE STRUCTURE WHEN REQUIRED DURING ERECTION TO MAINTAIN THE STABILITY OF THE STRUCTURE AND TO PREVENT OVERLOADING ANY MEMBER OF THE STRUCTURE.
19. FOUNDATIONS SHALL BE DESIGNED TO SUPPORT THE REACTIONS SHOWN FOR THE CONDITIONS EXISTING AT THE SITE.

TOWER SITE:
COUNTY:

No.	Revision Description	Date	Rev By	Ckd By	Appd By

ROHN

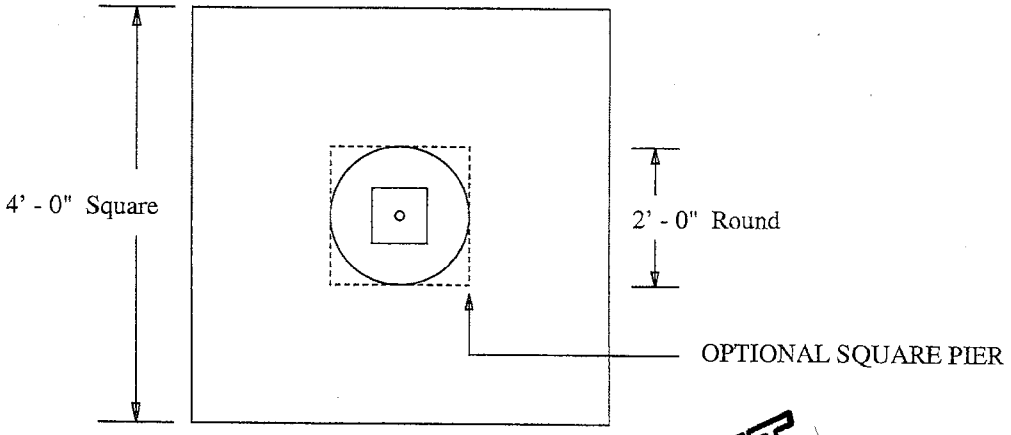
Scale: NONE	By	Date
Drawn:	FAD	06/10/09
Checked:		
App. Eng.:		
Parent File:		

252' 45GSR GUYED TOWER DESIGN FOR DNV GLOBAL ENERGY CONCEPTS

DWG. NO.: B090453

SHEET 1 OF 1 REV.

NOTE : SEE TOWER ASSEMBLY DRAWING FOR FOUNDATION LAYOUT AND PART NUMBERS FOR BEARING PLATE AND PIER PIN.



PLAN

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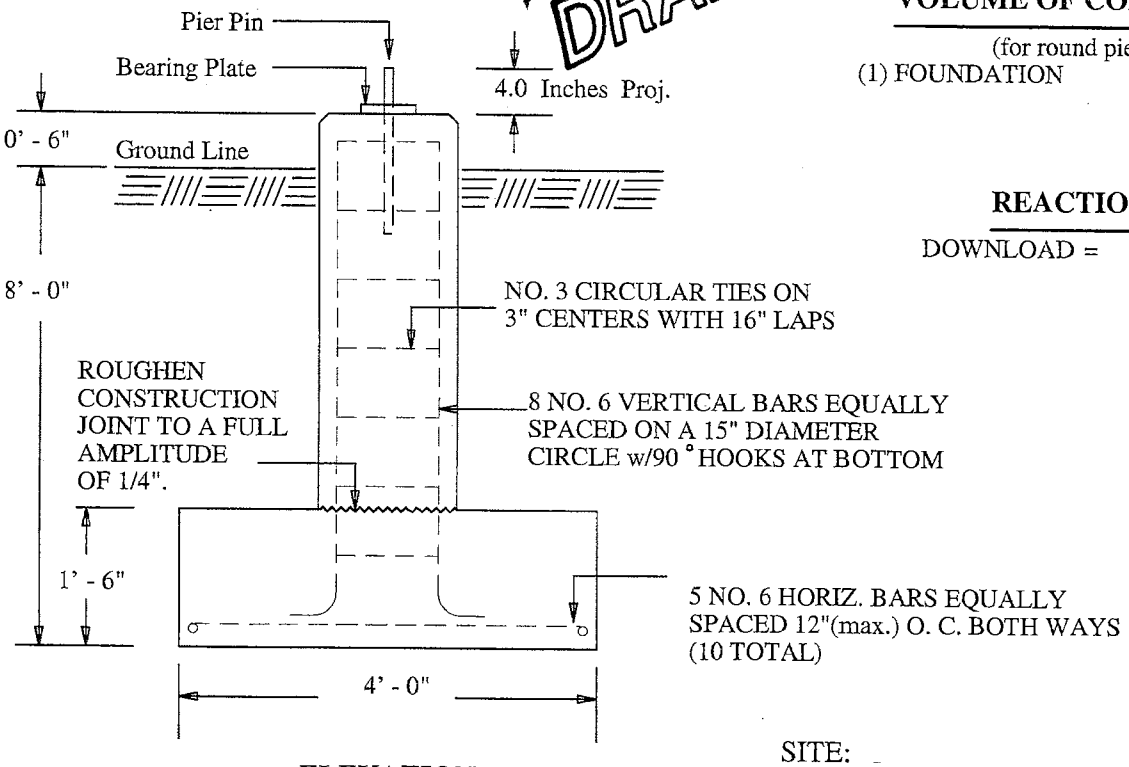


ELEVATION

VOLUME OF CONCRETE

(for round pier)
(1) FOUNDATION 1.7 Cu. Yds.

REACTIONS

DOWNLOAD = 34.9 KIPS

SITE:

SHEET 1 OF 3

No.	Revision Description	Date	Rev By	Ckd By	Appd By

ROHN

Scale: NONE	By	Date
Drawn:	FAD	06/10/09
Checked:	HA	6/10/09
App. Eng.:	HA	6/10/09

Title: **Basepier Foundation Detail for DNV Global Energy Concepts**

ENG. FILE:

DRAWING NO.:

DRAFT

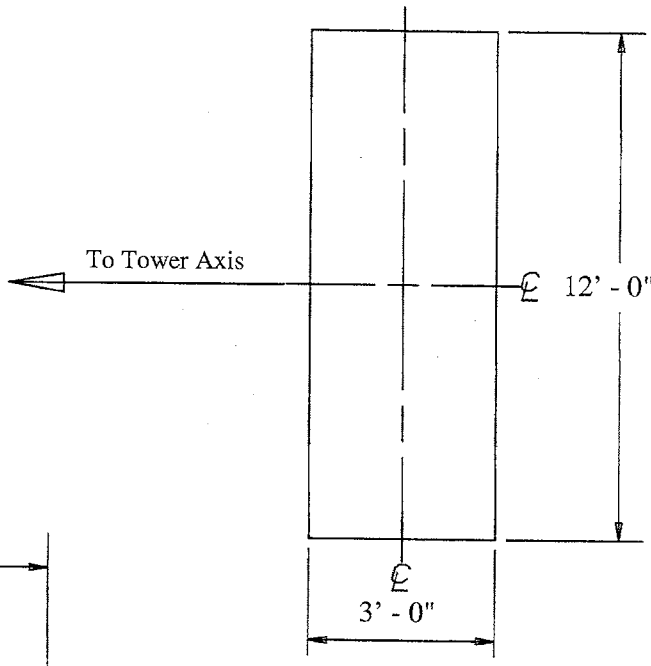
Foundation General Notes

1. Foundation Design has been developed in accordance with generally accepted professional engineering principles and practices within the limits of the subsurface data provided. Foundation design modifications may be required in the event the following design parameters are not applicable for the subsurface conditions encountered.
    A. Allowable net bearing pressure at 8.0 foot depth = 4.0 ksf.
    B. Ground water table at or below depth of foundation.
    C. Maximum frost depth less than depth of foundation.
2. Work shall be in accordance with local codes, safety regulations and unless otherwise noted, the latest revision of ACI 318, "Building Code Requirements for Reinforced Concrete". Procedures for the protection of excavations, existing construction and utilities shall be established prior to foundation installation.
3. Concrete materials shall conform to the appropriate state requirements for exposed structural concrete.
4. Proportions of concrete materials shall be suitable for installation method utilized and shall result in durable concrete for resistance to local anticipated aggressive actions. The durability requirements of ACI 318 Chapter 4 shall be satisfied based on the conditions expected at the site. As a minimum, concrete shall develop a minimum compressive strength of 4000 psi (27.6 MPa) in 28 days.
5. Maximum size of aggregate shall not exceed size suitable for the installation method utilized or 1/3 clear distance behind or between reinforcing. Maximum size may be increased to 2/3 clear distance provided workability and methods of consolidation such as vibrating will prevent honeycombs or voids.
6. Reinforcement shall be deformed and conform to the requirements of ASTM A615 grade 60 unless otherwise noted. Splices in reinforcement shall not be allowed unless otherwise indicated.
7. Welding is prohibited on reinforcing steel and embedments.
8. Minimum concrete cover for reinforcement shall be 3 inches (76 mm) unless otherwise noted. Approved spacers shall be used to insure a 3 inch (76 mm) minimum cover on reinforcement.
9. Foundation design assumes structural backfill to be compacted in 8 inch (200 mm) maximum layers to 95% of maximum dry density at optimum moisture content in accordance with ASTM D698. Additionally, structural backfill must have a minimum compacted unit weight of 100 lb./cu.ft. (15.7 kn/m3)..
10. Foundation design has been based on geotechnical boring logs no.
11. Foundation depth indicated is based on the grade line described in the referenced boring log. Foundation modification may be required in the event cut or fill operations have taken place subsequent to the geotechnical investigation.
12. Foundation installation shall be supervised by personnel knowledgeable and experienced with the proposed foundation type. Construction shall be in accordance with generally accepted installation practices.
13. Foundation design assumes field inspections will be performed to verify that construction

materials, installation methods and assumed design parameters are acceptable based on conditions existing at the site.

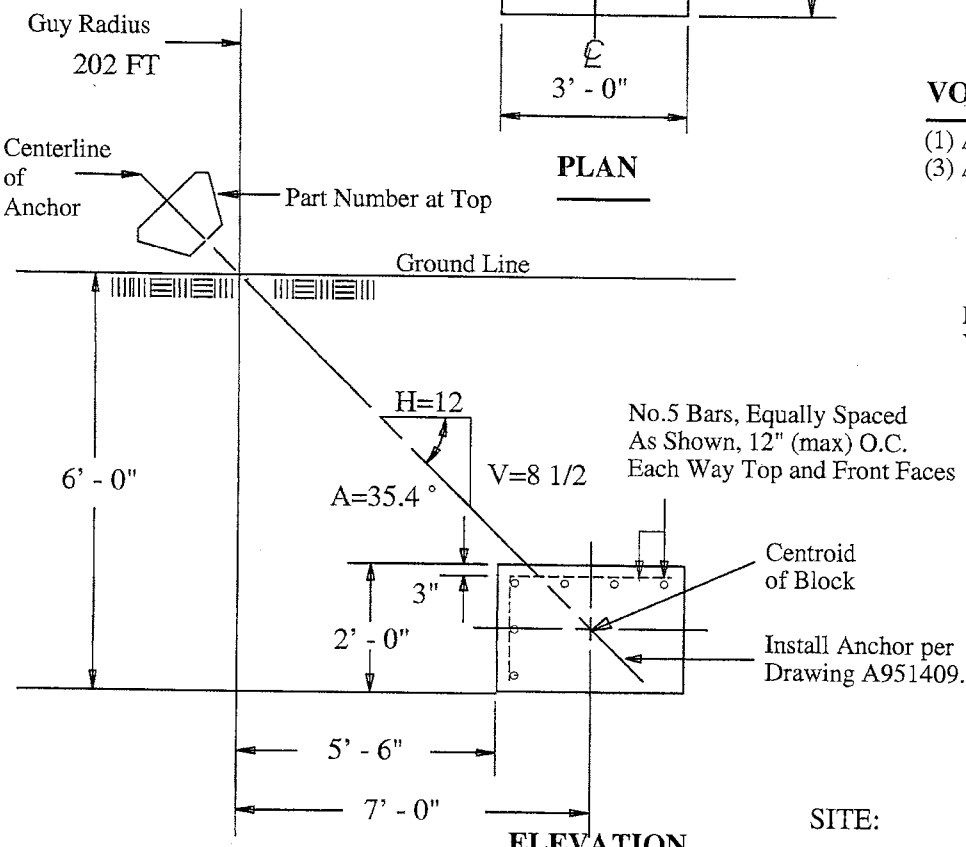
14. For foundation and anchor tolerances see structure assembly drawing.
15. Loose material shall be removed from bottom of excavation prior to concrete placement. Sides of excavation shall be rough and free of loose cuttings.
16. Concrete shall be placed in a manner that will prevent segregation of concrete materials, infiltration of water or soil and other occurrences which may decrease the strength or durability of the foundation.
17. Concrete preferably shall be placed against undisturbed soil. When forms are necessary, they shall be removed prior to placing structural backfill.
18. Construction joints, if required in piers, must be at least 12 inches (305 mm) below bottom of embedments and must be intentionally roughened to a full amplitude of 1/4 inch (6 mm). Foundation design assumes no other construction joints.
19. Exposed edges of concrete shall be chamfered 3/4" x 3/4" (19mm x 19mm) minimum.
20. Top of foundation outside limits of bearing plate shall be sloped to drain with a floated finish. Area inside limits of bearing plate shall be level.

NOTE : SEE TOWER ASSEMBLY DRAWING FOR FOUNDATION LAYOUT AND ANCHORAGE EMBEDMENT DRAWING NUMBER.



PLAN

DRAFT



ELEVATION

VOLUME OF CONCRETE

(1) Anchor Block	2.7	Cu. Yds.
(3) Anchor Blocks	8.1	Cu. Yds.

REACTIONS

Horizontal	= 16.6	KIPS
Vertical	= -11.8	KIPS

SITE:

SHEET 1 OF 3

No.	Revision Description	Date	Rev By	Ckd By	Appd By

ROHN

Scale: NONE	By	Date
Drawn:	FAD	06/10/2009
Checked:	HA	6/10/09
App. Eng.:	HA	6/10/09

Title: **ANCHOR BLOCK DETAIL at 202 Ft. Radius for DNV Global Energy Concepts**

ENG. FILE:

DRAWING NO.:

DRAFT

Foundation General Notes

1. Foundation Design has been developed in accordance with generally accepted professional engineering principles and practices within the limits of the subsurface data provided. Foundation design modifications may be required in the event the following design parameters are not applicable for the subsurface conditions encountered.
    A. Allowable net bearing pressure at 3.5 foot depth = 2.0 ksf.
    B. Maximum frost depth less than depth of foundation.
    C. Ground water table below depth of foundation.
2. Work shall be in accordance with local codes, safety regulations and unless otherwise noted, the latest revision of ACI 318, "Building Code Requirements for Reinforced Concrete". Procedures for the protection of excavations, existing construction and utilities shall be established prior to foundation installation.
3. Concrete materials shall conform to the appropriate state requirements for exposed structural concrete.
4. Proportions of concrete materials shall be suitable for installation method utilized and shall result in durable concrete for resistance to local anticipated aggressive actions. The durability requirements of ACI 318 Chapter 4 shall be satisfied based on the conditions expected at the site. As a minimum, concrete shall develop a minimum compressive strength of 4000 psi (27.6 MPa) in 28 days.
5. Maximum size of aggregate shall not exceed size suitable for the installation method utilized or 1/3 clear distance behind or between reinforcing. Maximum size may be increased to 2/3 clear distance provided workability and methods of consolidation such as vibrating will prevent honeycombs or voids.
6. Reinforcement shall be deformed and conform to the requirements of ASTM A615 grade 60 unless otherwise noted. Splices in reinforcement shall not be allowed unless otherwise indicated.
7. Welding is prohibited on reinforcing steel and embedments.
8. Minimum concrete cover for reinforcement shall be 3 inches (76 mm) unless otherwise noted. Approved spacers shall be used to insure a 3 inch (76 mm) minimum cover on reinforcement.
9. Foundation design assumes structural backfill to be compacted in 8 inch (200 mm) maximum layers to 95% of maximum dry density at optimum moisture content in accordance with ASTM D698. Additionally, structural backfill must have a minimum compacted unit weight of 100 lb./cu.ft. (15.7 kn/m3)..
10. Foundation design has been based on geotechnical boring logs no.
11. Foundation depth indicated is based on the grade line described in the referenced boring log. Foundation modification may be required in the event cut or fill operations have taken place subsequent to the geotechnical investigation.
12. Foundation design assumes level grade at site.
13. Foundation installation shall be supervised by personnel knowledgeable and experienced with the proposed foundation type. Construction shall be in accordance with generally accepted installation practices.

Engr File No.:

Drawing No.:

DRAFT

14. Foundation design assumes field inspections will be performed to verify that construction materials, installation methods and assumed design parameters are acceptable based on conditions existing at the site.
15. For foundation and anchor tolerances see structure assembly drawing.
16. Loose material shall be removed from bottom of excavation prior to concrete placement. Sides of excavation shall be rough and free of loose cuttings.
17. Concrete shall be placed in a manner that will prevent segregation of concrete materials, infiltration of water or soil and other occurrences which may decrease the strength or durability of the foundation.
18. Concrete preferably shall be placed against undisturbed soil. When forms are necessary, they shall be removed prior to placing structural backfill.
19. Foundation design assumes continuous concrete placement without construction joints.
20. Top of foundation outside limits of anchor bolts shall be sloped to drain with a floated finish. Area inside limits of anchor bolts shall be level with a scratched finish.
21. Exposed edges of concrete shall be chamfered 3/4" x 3/4" (19mm x 19mm) minimum.

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Foundation General Notes

1. Foundation Design has been developed in accordance with generally accepted professional engineering principles and practices within the limits of the subsurface data provided. Foundation design modifications may be required in the event the following design parameters are not applicable for the subsurface conditions encountered.
    A. Uplift angle with vertical = 20.0 degrees.
    B. Allowable net horizontal pressure = 150 psf/ft.
    C. Ground water table below depth of foundation.
2. Work shall be in accordance with local codes, safety regulations and unless otherwise noted, the latest revision of ACI 318, "Building Code Requirements for Reinforced Concrete". Procedures for the protection of excavations, existing construction and utilities shall be established prior to foundation installation.
3. Concrete materials shall conform to the appropriate state requirements for exposed structural concrete.
4. Proportions of concrete materials shall be suitable for installation method utilized and shall result in durable concrete for resistance to local anticipated aggressive actions. The durability requirements of ACI 318 Chapter 4 shall be satisfied based on the conditions expected at the site. As a minimum, concrete shall develop a minimum compressive strength of 4000 psi (27.6 MPa) in 28 days.
5. Maximum size of aggregate shall not exceed size suitable for the installation method utilized or 1/3 clear distance behind or between reinforcing. Maximum size may be increased to 2/3 clear distance provided workability and methods of consolidation such as vibrating will prevent honeycombs or voids.
6. Reinforcement shall be deformed and conform to the requirements of ASTM A615 grade 60 unless otherwise noted. Splices in reinforcement shall not be allowed unless otherwise indicated.
7. Welding is prohibited on reinforcing steel and embedments.
8. Minimum concrete cover for reinforcement shall be 3 inches (76 mm) unless otherwise noted. Approved spacers shall be used to insure a 3 inch (76 mm) minimum cover on reinforcement.
9. Foundation design assumes structural backfill to be compacted in 8 inch (200 mm) maximum layers to 95% of maximum dry density at optimum moisture content in accordance with ASTM D698. Additionally, structural backfill must have a minimum compacted unit weight of 100 lb./cu.ft. (15.7 kn/m3)..
10. Foundation design has been based on geotechnical boring logs no.
11. Foundation depth indicated is based on the grade line described in the referenced boring log. Foundation modification may be required in the event cut or fill operations have taken place subsequent to the geotechnical investigation.
12. Foundation installation shall be supervised by personnel knowledgeable and experienced with the proposed foundation type. Construction shall be in accordance with generally accepted installation practices.
13. Foundation design assumes field inspections will be performed to verify that construction

DRAFT

materials, installation methods and assumed design parameters are acceptable based on conditions existing at the site.

14. For foundation and anchor tolerances see structure assembly drawing.
15. Loose material shall be removed from bottom of excavation prior to concrete placement. Sides of excavation shall be rough and free of loose cuttings.
16. Concrete shall be placed in a manner that will prevent segregation of concrete materials, infiltration of water or soil and other occurrences which may decrease the strength or durability of the foundation.
17. Foundation design assumes continuous concrete placement without construction joints.
18. The portion of all steel anchors, from top of anchor block to ground level, shall be coated with bitumen. Design assumes periodic inspections will be performed over the life of the structure to determine if additional anchor corrosion protection measures must be implemented based on observed site-specific conditions.
19. Grading may be required to provide proper drainage away from anchors and to maintain 6 inch (152mm) minimum clearance to equalizer plate.
20. Depth of anchor block shown on drawing must be maintained at all points within an area defined by the plan dimensions of the anchor block plus a horizontal distance in each direction equal to the specified anchor block depth below grade. Fill, when required, shall meet the compaction requirements specified for structural backfill.

Appendix 12-2
Wastewater Report

Highland Wind Power Project

Wastewater Disposal & Soils Maintenance Building Site

NOVEMBER, 2009

Prepared by: Albert Frick

Albert Frick Associates, Inc.

95A County Road

Gorham, Maine 04038

(207) 839-5563

(207) 839-5564 (fax)

afa@maine.rr.com

Table of Contents

1.0 On-Site Subsurface Wastewater Disposal

The proposed Operations and Maintenance Building is the only component of the *Highland Wind Project* that produces wastewater. The proposed subsurface wastewater disposal design includes a standard septic system to process wastewater from the building. This system is sized slightly larger than the proposed long-term maintenance staff requires, so as to accommodate potential higher usage during construction phase and/or potential future site visitors. The proposed subsurface wastewater disposal system (HHE-200 form) is included in Appendix A.

During the construction phase, Highland Wind Project (or their contractors) will supply temporary chemical toilets at convenient locations around the project site.

1.1 Site Plan

The proposed septic disposal system will be sited on the Maintenance Facility Lot in a location with adequate soil drainage, a minimum of 100' from the water supply well. The proposed Site Plan is shown on the Maintenance Facility Layout map, included in Figure 1.1 of this section. An on-site subsurface wastewater disposal evaluation and permit application has been completed by Albert Frick Associates, included in Appendix A. The proposed subsurface wastewater disposal system complies with the State of Maine Subsurface Wastewater Disposal Rules, and the soils for the proposed Maintenance Facility are suitable for development. The proposed septic design meets the LURC standards of Section 10.25 I.

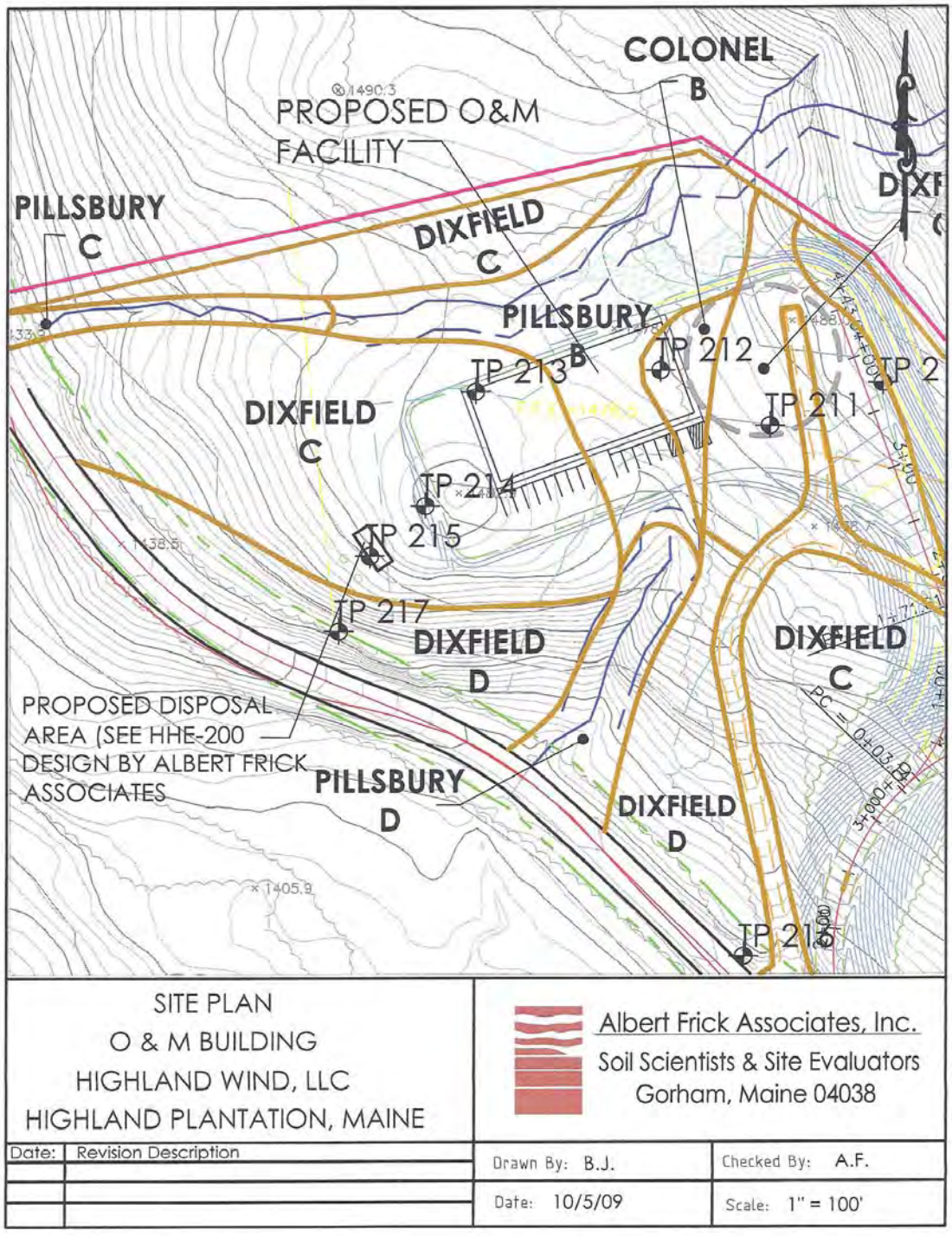


Figure 1.1 Site Plan and High Intensity Soil Map

1.2 Nitrate-Nitrogen Impact Assessment – Exempt

The sewage disposal system will be a conventional system disposing of less than 300 gallons per day of domestic wastewater (as defined in Maine Subsurface Wastewater Disposal Rules, 10-144A CMR 241). It will thus not require a Nitrate-Nitrogen impact assessment.

1.3 Soils Analysis of Maintenance Facility Lot

The proposed Maintenance Facility site is comprised of *Dixfield*, *Colonel* and *Pillsbury* soils, which are sandy loam textured soils derived form glacial till.

The *Dixfield* soil is moderately well drained, the C*olonel* soils is somewhat poorly drained, and *Pillsbury* soil is poorly drained.

Class B High Intensity Soils map is shown in Figure 1.1. The detailed Soil Narrative Report is included in Section 13, which describes the soil types in more detail.

2.0 Appendices

A. Proposed Septic System Design (HHE-200), by Albert Frick, Licensed Site Evaluator

APPENDIX A

Proposed Septic System Design (HHE-200), by Albert Frick, Licensed Site Evaluator

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. of Health & Human Services
Division of Environmental Health , SHS 11
(207) 287-5689 FAX (207) 287-3165

PROPERTY LOCATION

City, Town, or Plantation	HIGHLAND PLANTATION
Street or Road	LONG FALLS DAM ROAD
Subdivision, Lot #	

>> Caution: Permit Required – Attach In Space Below <<

The Subsurface Wastewater Disposal System ***must not*** be installed until a Permit is attached HERE by the Local Plumbing Inspector. The Permit will authorize the owner or installer to install the disposal system in accordance with this application and the Maine Subsurface Wastewater Disposal Rules.

OWNER/APPLICANT INFORMATION

Name (last, first, MI)	HIGHLAND WIND, LLC — Owner ~~Applicant~~
Mailing Address of ■ Owner ☐ Applicant	C/O JONATHAN RYAN STANTEC 30 PARK DRIVE TOPSHAM, ME 04086
Daytime Tel. #	207-729-1199

Municipal Tax Map # _____ Lot # _____

Owner or Applicant Statement

I state and acknowledge that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Department and/or Local Plumbing Inspector to deny a permit.

Signature of Owner/Applicant _____ Date _____

Caution: Inspections Required

I have inspected the installation authorized above and found it to be in compliance with the Subsurface Wastewater Disposal Rules Application.

(1st) Date Approved _____

Local Plumbing Inspector Signature _____ (2nd) Date Approved _____

PERMIT INFORMATION

TYPE OF APPLICATION (Check only one item)

1. ■ First Time System
2. ☐ Replacement System
   Type Replaced: _____
   Year Installed: _____
3. ☐ Expanded System
4. ☐ Experimental System

THIS APPLICATION REQUIRES

1. ■ No Rule Variance
2. ☐ First Time System Variance
   a. ☐ Local Plumbing Inspector Approval
   b. ☐ State & Local Plumbing Inspector Approval
3. Replacement System Variance
   a. ☐ Local Plumbing Inspector Approval
   b. ☐ State & Local Plumbing Inspector Approval

DISPOSAL SYSTEM COMPONENTS

1. ■ Complete Non-Engineered System
2. ☐ Primitive System(graywater & alt toilet)
3. ☐ Pit Privy
5. ☐ Holding Tank, _____ Gallons
6. ☐ Non-Engineered Disposal Field (only)
7. ☐ Graywater System
8. ☐ Complete Engineered System(2000gpd+)
10. ☐ Engineered Disposal Field (only)
11. ☐ Pre-treatment, specify:

(item numbers are used for data entry purposes)

SIZE OF PROPERTY

1000+ ACRES ☐ sq. ft. ■ acres

SHORELAND ZONING

☐ Yes ■ No

DISPOSAL SYSTEM TO SERVE

1. ☐ Single Family Dwelling Unit, No. of Bedrooms: ____
2. ☐ Multiple Family Dwelling, No of Units: ____
3. ■ Other: OPERATION AND MAINTENANCE BUILDING (specify)

TYPE OF WATER SUPPLY

1. ■ Drilled Well 2. ☐ Dug Well 3. ☐ Spring
4. ☐ Public 5. ☐ Other:

DESIGN DETAILS (SYSTEM LAYOUT SHOWN ON PAGE 3)

TREATMENT TANK

1. ■ Concrete
   a. ☐ Regular
   b. ☐ Low Profile
2. ☐ Plastic
3. ☐ Other: _____
   CAPACITY 1000 gallons

DISPOSAL FIELD TYPE & SIZE

1. ☐ Stone Bed ☐ 2. Stone Trench
3. ■ Proprietary Device
   a. ☐ Cluster array c. ■ Linear
   b. ■ Regular d. ☐ H-20 loaded
4. ☐ Other:
   SIZE 900 ■ sq. ft. ☐ lin. ft.

18 HIGH CAPACITY PLASTIC CHAMBERS

GARBAGE DISPOSAL UNIT

1. ■ No 2. ☐ Yes

If Yes, Specify one below:

a. ☐ Multi-compartment tank
b. ☐ _____ tanks in series
c. ☐ Increase in tank capacity
d. ☐ Filter on tank outlet

DESIGN FLOW

270 gallons per day
BASED ON:
1. ☐ Table 501.1 (dwelling unit(s))
2. ■ Table 501.2 (other facilities)
   SHOW CALCULATIONS
   - for other facilities -

OPERATION AND MAINTENANCE BUILDING (18 EMPLOYEES)

3. ☐ Section 503.0 (meter readings)
   ATTACH WATER-METER DATA

SOIL DATA & DESIGN CLASS

PROFILE 3 / CONDITION C / DESIGN 1

AT Observation Hole # TP 215
Depth 15" Elevation -19"
OF MOST LIMITING SOIL FACTOR

DISPOSAL FIELD SIZING

2. ☐ Medium - 2.6 sq.ft./gpd
3. ■ Medium-Large - 3.3 sq.ft./gpd
4. ☐ Large - 4.1 sq.ft./gpd
5. ☐ Extra-Large - 5.0 sq.ft./gpd

(item numbers are used for data entry purposes)

EFFLUENT/EJECTOR PUMP

SEE SEPTIC TANK NOTE ON PAGE 3

1. ■ Not required
2. ☐ Required

Specify only for engineered systems:
DOSE: _____ Gallons

LATITUDE AND LONGITUDE

at center of disposal area
Lat. 45 d 4 m 40 s
Lon. 70 d 7 m 12 s
If g.p.s., state margin of error _____

SITE EVALUATOR STATEMENT

I Certify that on 10/13/09 (date) I completed a site evaluation on this property and state that the data reported is accurate and that the proposed system is in compliance with the Subsurface Wastewater Disposal Rules (10-144A CMR 241).

Albert Frick — Site Evaluator Signature

163 — SE #

11/5/2009 — Date

ALBERT FRICK — Site Evaluator Name Printed

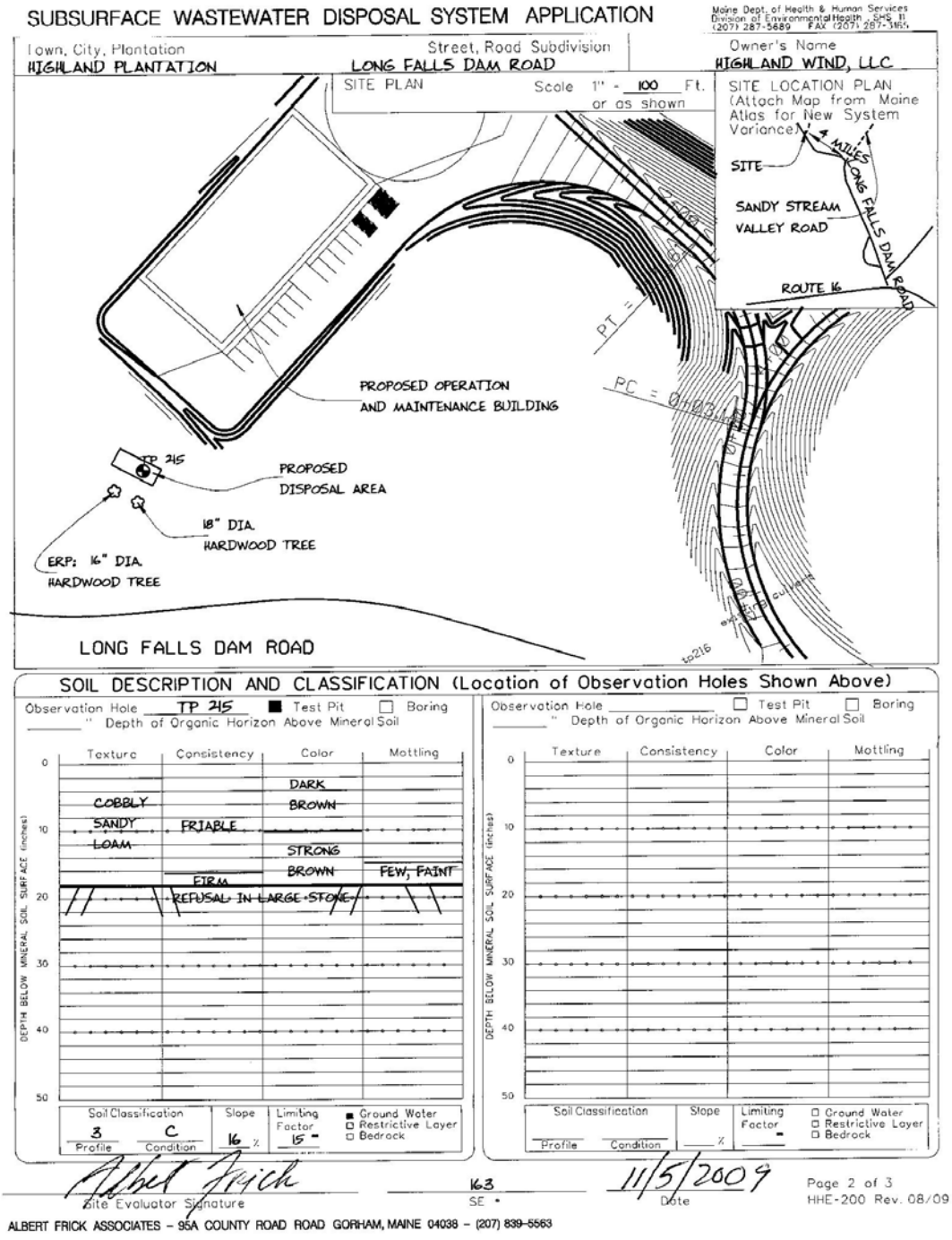
(207) 839-5563 — Telephone Number

AFA@MAINERR.COM — E-mail Address

ALBERT FRICK ASSOCIATES – 95A COUNTY ROAD ROAD GORHAM, MAINE 04038 – (207) 839-5563

Note: Changes to or deviations from the design should be confirmed with the Site Evaluator

HHE-200 Rev. 08/09



SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. of Health & Human Services
Division of Environmental Health SHS 11
(207) 287-5689 FAX (207) 287-3165

Town, City, Plantation: HIGHLAND PLANTATION
Street, Road Subdivision: LONG FALLS DAM ROAD
Owner's Name: HIGHLAND WIND, LLC

SITE PLAN Scale 1" = 100 Ft. or as shown

SITE LOCATION PLAN (Attach Map from Maine Atlas for New System Variance)

4 MILES ALONG FALLS DAM ROAD
SITE
SANDY STREAM VALLEY ROAD
ROUTE 16

PROPOSED OPERATION AND MAINTENANCE BUILDING
TP 215
PROPOSED DISPOSAL AREA
18" DIA. HARDWOOD TREE
ERP: 16" DIA. HARDWOOD TREE
LONG FALLS DAM ROAD
PT =
PC = 0+03.4
to 216

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 215 ■ Test Pit ☐ Boring
" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)	Texture	Consistency	Color	Mottling
0–10	COBBLY SANDY LOAM	FRIABLE	DARK BROWN	
10–20			STRONG BROWN	FEW, FAINT
20–50		FIRM REFUSAL IN LARGE STONE		

Soil Classification	Slope	Limiting Factor	
Profile: 3	16 %	15"	■ Ground Water ☐ Restrictive Layer ☐ Bedrock
Condition: C			

Observation Hole ____ ☐ Test Pit ☐ Boring
" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)	Texture	Consistency	Color	Mottling
0–50				

Soil Classification	Slope	Limiting Factor	
Profile	%	"	☐ Ground Water ☐ Restrictive Layer ☐ Bedrock
Condition			

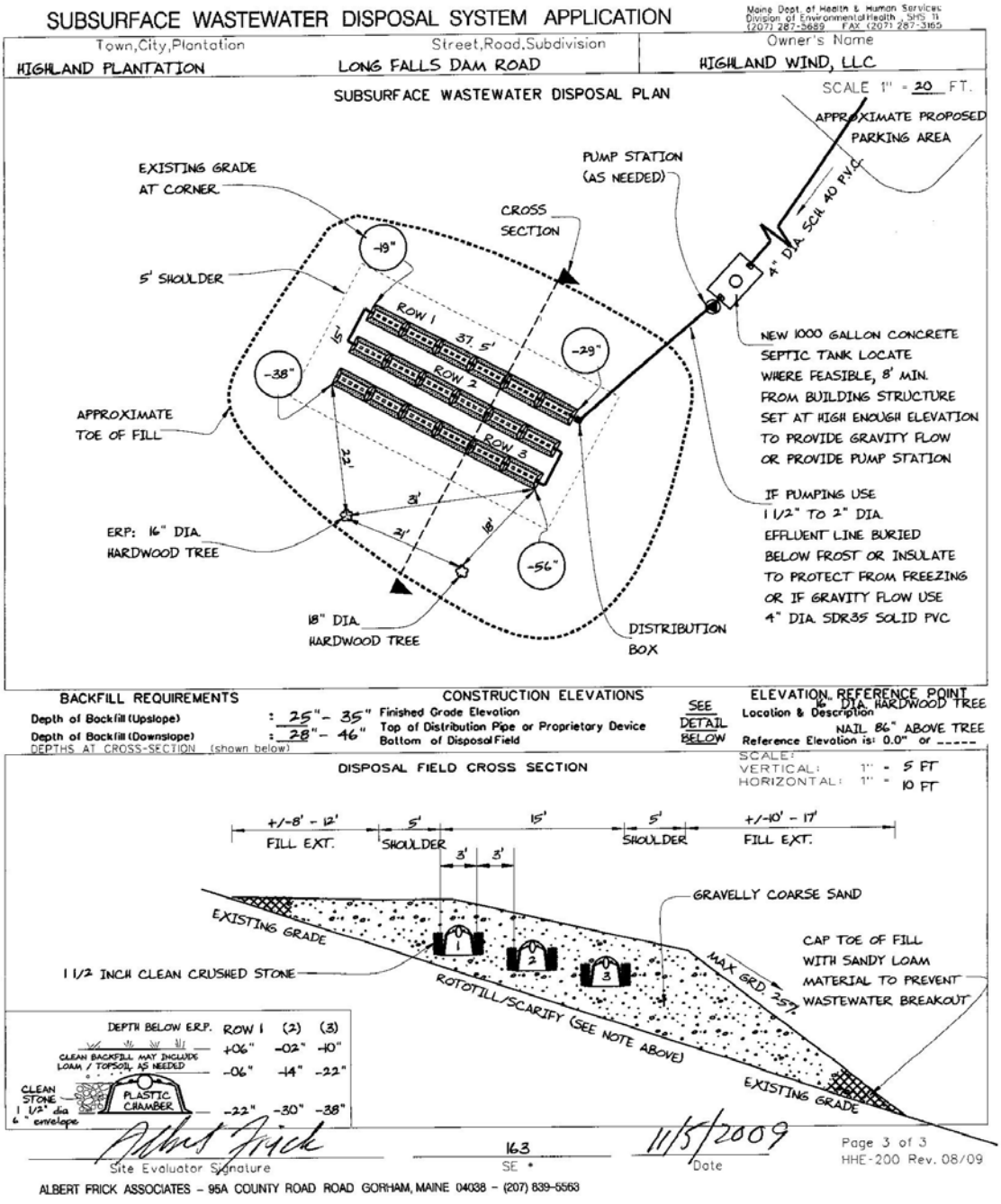
Albert Frick
Site Evaluator Signature

163
SE #

11/5/2009
Date

Page 2 of 3
HHE-200 Rev. 08/09

ALBERT FRICK ASSOCIATES – 95A COUNTY ROAD ROAD GORHAM, MAINE 04038 – (207) 839-5563


SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION
Maine Dept. of Health & Human Services
Division of Environmental Health, SHS 11
(207) 287-3689 FAX (207) 287-3165
Town, City, Plantation
HIGHLAND PLANTATION
Street, Road, Subdivision
LONG FALLS DAM ROAD
Owner's Name
HIGHLAND WIND, LLC
SUBSURFACE WASTEWATER DISPOSAL PLAN
SCALE 1" = 20 FT.
APPROXIMATE PROPOSED PARKING AREA
EXISTING GRADE AT CORNER
PUMP STATION (AS NEEDED)
CROSS SECTION
4" DIA. SCH. 40 P.V.C.
5' SHOULDER
-19"
ROW 1
ROW 2
ROW 3
37.5'
-29"
-38"
-56"
APPROXIMATE TOE OF FILL
22'
3'
3'
3'
ERP: 16" DIA. HARDWOOD TREE
18" DIA. HARDWOOD TREE
DISTRIBUTION BOX
NEW 1000 GALLON CONCRETE SEPTIC TANK LOCATE WHERE FEASIBLE, 8' MIN. FROM BUILDING STRUCTURE SET AT HIGH ENOUGH ELEVATION TO PROVIDE GRAVITY FLOW OR PROVIDE PUMP STATION
IF PUMPING USE 1 1/2" TO 2" DIA. EFFLUENT LINE BURIED BELOW FROST OR INSULATE TO PROTECT FROM FREEZING OR IF GRAVITY FLOW USE 4" DIA. SDR35 SOLID PVC
BACKFILL REQUIREMENTS
Depth of Backfill (Upslope) : 25" - 35"
Depth of Backfill (Downslope) : 28" - 46"
DEPTHS AT CROSS-SECTION (shown below)
CONSTRUCTION ELEVATIONS
Finished Grade Elevation
Top of Distribution Pipe or Proprietary Device
Bottom of Disposal Field
SEE DETAIL BELOW
ELEVATION REFERENCE POINT
16" DIA. HARDWOOD TREE
Location & Description
NAIL 86" ABOVE TREE
Reference Elevation is: 0.0" or _____
DISPOSAL FIELD CROSS SECTION
SCALE:
VERTICAL: 1" = 5 FT
HORIZONTAL: 1" = 10 FT
+/-8' - 12'
FILL EXT.
5'
SHOULDER
15'
5'
SHOULDER
+/-10' - 17'
FILL EXT.
3'
3'
GRAVELLY COARSE SAND
EXISTING GRADE
1 1/2 INCH CLEAN CRUSHED STONE
CAP TOE OF FILL WITH SANDY LOAM MATERIAL TO PREVENT WASTEWATER BREAKOUT
MAX GRD. 25%
ROTOTILL/SCARIFY (SEE NOTE ABOVE)
EXISTING GRADE
DEPTH BELOW E.R.P. ROW 1 (2) (3)
CLEAN BACKFILL MAY INCLUDE LOAM / TOPSOIL AS NEEDED
+06" -02" -10"
-06" -14" -22"
CLEAN STONE 1 1/2" dia & " envelope
PLASTIC CHAMBER
-22" -30" -38"
Site Evaluator Signature
163
SE #
11/5/2009
Date
Page 3 of 3
HHE-200 Rev. 08/09
ALBERT FRICK ASSOCIATES – 95A COUNTY ROAD ROAD GORHAM, MAINE 04038 – (207) 839-5563

Albert Frick Associates, Inc.
Soil Scientists & Site Evaluators
95A County Road Gorham, Maine 04038
(207) 839-5563

HIGHLAND PLANTATION	LONG FALLS DAM ROAD	HIGHLAND WIND, LLC
TOWN	LOCATION	APPLICANT'S NAME

1) The Plumbing and Subsurface Wastewater Disposal Rules adopted by the State of Maine, Department of Human Services pursuant to 22 M.R.S.A. § 42 (the "Rules") are incorporated herein by reference and made a part of this application and shall be consulted by the owner/applicant, the system installer and/or building contractor for further construction details and material specifications. The system Installer should contact Albert Frick Associates, Inc. 839-5563, if there are any questions concerning materials, procedures or designs. The system installer and/or building contractor installing the system shall be solely responsible for compliance with the Rules and with all state and municipal laws and ordinances pertaining to the permitting, inspection and construction of subsurface wastewater disposal systems.

2) This application is intended to represent facts pertinent to the Rules only. It shall be the responsibility of the owner/applicant, system Installer and/or building contractor to determine compliance with and to obtain permits under all applicable local, state and/or federal laws and regulations (including, without limitation, Natural Resources Protection Act, wetland regulations, zoning ordinances, subdivision regulations, Site Location of Development Act and minimum lot size laws) before installing this system or considering the property on which the system is to be installed a "buildable" lot. It is recommended that a wetland scientist be consulted regarding wetland regulations. Prior to the commencement of construction/installation, the local plumbing inspector or Code Enforcement Officer shall inform the owner/applicant and Albert Frick Associates, Inc of any local ordinances which are more restrictive than the Rules in order that the design may be amended. All designs are subject to review by local, state and/or federal authorities. Albert Frick Associates, Inc.'s liability shall be limited to revisions required by regulatory agencies pursuant to laws or regulations in effect at the time of preparation of this application.

3) All information shown on this application relating to property lines, well locations, subsurface structures and underground facilities (such as utility lines, drains, septic systems, water lines, etc.) are based solely upon information provided by the owner/applicant and has been relied upon by Albert Frick Associates, Inc. in preparing this application. The owner/applicant shall review this application prior to the start of construction and confirm this information. Well locations on abutting properties but not readily visible above grade should be confirmed by the owner/applicant prior to system installation to assure minimum setbacks.

4) Installation of a garbage (grinder) disposal is not recommended. If one is installed, an additional 1000 gallon septic tank or a septic tank filter shall be connected in series to the proposed septic tank. Risers and covers should be installed over the septic tank outlet to allow for easy maintenance.

5) The system user shall avoid introducing kitchen grease or fats into this system. Chemicals such as septic tank cleaners and/or chlorine (such as from water treatment units) and controlled or hazardous substances shall not be disposed of in this system. Additives such as yeast or enzymes are discouraged, since they have not been proven to extend system life.

6) The septic tank should be pumped within two years of installation and subsequently as recommended by the pump service, but in no event should the septic tank be pumped less often than every three years. All septic tanks, pump stations and additional treatment tanks shall be installed to prevent ground water and surface water infiltration. Risers and covers should be properly installed to provide access while preventing surface water intrusion.

ATTACHMENT TO SUBSURFACE WASTEWATER DISPOSAL APPLICATION

HIGHLAND PLANTATION	LONG FALLS DAM ROAD	HIGHLAND WIND, LLC
TOWN	LOCATION	APPLICANT'S NAME

7) The actual water flow or number of bedrooms shall not exceed the design criteria indicated on this application without a re-evaluation of the system as proposed. If the system is supplied by public water or a private service with a water meter, the water consumption per period should be divided by the number of days to calculate the average daily water consumption [water usage (cu. ft.) x 7.48 cu. ft. (gallons per cu. ft.) ÷ (# of days in period) = gals per day].

8) The general minimum setbacks between a well and septic system serving a single family residence is 100-300 feet, unless the local municipality has a more stringent requirement. A well installed by an abutter within the minimum setback distances prior to the issuance of a permit for the proposed disposal system may void this design.

9) When a gravity system is proposed: BEFORE CONSTRUCTION/INSTALLATION BEGINS, the system installer or building contractor shall review the elevations of all points given in this application and the elevation of the existing and/or proposed building drain and septic tank inverts for compatibility to minimum slope requirement. In gravity systems, the invert of the septic tank(s) outlet(s) shall be at least 4 inches above the invert of the distribution box outlet at the disposal area.

10) When an effluent pump is required: Provisions shall be made to make certain that surface and ground water does not enter the septic tank or pump station, by sealing/grouting all seams and connections, and by placement of a riser and lid at or above grade. An alarm device warning of a pump failure shall be installed. Also, when pumping is required of a chamber system, install a "T" connection in the distribution box and place 3 inches of stone or a splash plate in the first chamber. Insulate gravity pipes, pump lines and the distribution box as necessary to prevent freezing.

11) On all systems, remove the vegetation, organic duff and old fill material from under the disposal area and any fill extension. On sites where the proposed system is to be installed in natural soil, scarify the bottom and sides of the excavated disposal area with a rake. Do not use wheeled equipment on the scarified soil surface. For systems installed in fill, scarify the native soil by roto-tilling or scarifying with teeth of backhoe to a depth of at least 8 inches over the entire disposal and fill extension area to prevent glazing and to promote fill bonding. Place fill in loose layers no deeper that 8 inches and compact before placing more fill (this ensures that voids and loose pockets are eliminated to minimize the chance of leakage or differential setting). Do not use wheeled equipment on the scarified soil area until after 12 inches of fill is in place. Keep equipment off proprietary devices. Divert the surface water away from the disposal area by ditching or shallow landscape swales.

12) Unless noted otherwise, fill shall be gravelly coarse sand which contains no more that 5% fines (silt and clay). Crushed stone shall be clean and free of any rock dust from the crushing process.

13) Do not install systems on loamy, silty, or clayey soils during wet periods since soil smearing/glazing may seal off the soil interface.

14) Seed all filled and disturbed surfaces with perennial grass seed, then mulch with hay or equivalent material to prevent erosion. Alternatively, bark or permanent landscape mulch may be used to cover system. Woody trees or shrubs are not permitted on the disposal area or fill extensions.

15) If an advanced wastewater treatment unit is part of the design, the system shall be operated and maintained per manufacturer's specifications.

Albert Frick Associates, Inc.
Soil Scientists & Site Evaluators
95A County Road Gorham, Maine 04038
(207) 839-5563

APPENDIX B

Soils Report for Maintenance Building Site

See Colonel, Dixfield and Pillsbury

Soil map unit descriptions and

Soil Narrative Report in Section 13

Appendix 12-3
Correspondence from Crossroads Landfill

CROSSROADS LANDFILL
A WASTE MANAGEMENT COMPANY

P.O. Box 629
357 Mercer Road
Norridgewock, Maine 04957
(207) 634-2714
(207) 634-4519 Fax

December 14, 2010

Brett C. Hart, P.E.
Project Manager, Engineering
Sewall Company
P.O. Box 433
136 Center Street
Old Town, Maine 04468

Re: Crossroads Disposal Capacity

Dear Mr. Hart:

Please be advised that Waste Management Disposal Services of Maine – Crossroads Landfill has a commercial solid waste disposal facility located in Norridgewock, Maine. At this time, we have approximately 4 million cubic yards of airspace remaining in our Phase 8 landfill cell.

This will be sufficient airspace to accommodate the construction and demolition debris generated from the proposed Highland Plantation wind farm project.

If I can be of further assistance please don't hesitate to contact me at 207-634-2714 X210.

Sincerely,

Waste Management Disposal Services of Maine, Inc. – Crossroads

Jeffrey A. McGown
District Manager

Appendix 12-4
Acid Rock Report

SUMMIT

ENVIRONMENTAL CONSULTING • GEOTECHNICAL ENGINEERING • CONSTRUCTION MATERIALS TESTING

PN: 17541

January 18, 2010

Robert Gardiner
Highland Wind LLC
c/o Wagner Wind Energy II, LLC
150 Orford Rd
PO Box 160
Lyme, New Hampshire 03768

RE: Acid Rock Drainage

Dear Mr. Gardiner:

On behalf of Highland Wind, LLC, Summit Geoenginering Services, (Summit) has evaluated the bedrock geology of the project Site to assess whether acidic storm water or surface water runoff is likely to be generated from exposed bedrock resulting from bedrock cuts or fills during construction.

Background

Environmental impacts resulting from acidic surface water drainage have been well documented in the Appalachian basin and most typically are associated with large scale coal mining activities in Pennsylvania and West Virginia. To a lesser extent, acidic drainage can occur as a result of mineral mining operations.

Acid drainage can be generated when the following conditions exist:

- Elevated concentrations of sulfide, iron and carbonaceous material are present in the rock matrix. The most common mineral associated with acid drainage is pyrite (FeS2). During chemical weathering of the rocks, the interaction of rainwater with the sulfide minerals produces a weak sulfuric acid.
- Strongly reducing conditions exist (low Ph, low dissolved oxygen, negative Oxidation-Reduction Potential (ORP)).

- A significant volume (and more importantly, surface area) of freshly exposed rock or mine tailings.

Highland Project Site

In general, the rock types and geologic setting of the western Maine mountains are not conducive to generation of acid drainage. However, where rock formations exist with more abundant pyrite, further evaluation and/or plans to address potential acidic drainage may be warranted.

Rock types within the project area include a complex mix of geologic units ranging from metasedimentary rocks to a massive intrusive igneous pluton. Bedrock in this area is mapped as parts of the Seboomook Formation, the Carrabassett Formation and the Lexington Batholith. The Seboomook and Carrabassett Formations are Lower Devonian aged formations that originated as sedimentary rocks (mudstones from ancient ocean deposits) that have been heavily metamorphosed into schist-like metamorphic rocks. Witham Mountain is part of the Lexington Batholith, an intrusive igneous complex that is the dominant geologic formation in the area.

The transition between the igneous intrusive complex and metamorphic rocks (i.e., the Witham elbow area) may be an area where geologic conditions could have been more conducive to mineral formation, specifically pyrite, in quantities that could pose a concern.

With respect to the Witham elbow area, Summit's geotechnical investigation included geological analysis of four borings at proposed turbine sites W-17, W-18, W-19 and W-20. Borings were advanced to a depth of fifty (50) feet at each proposed turbine location. Overburden was sampled (where present) and bedrock beneath overburden was cored to approximately 50 feet below ground surface. Since overburden is thin in this area, 43 to 48 feet of core were recovered from these borings and evaluated for rock type and mineral content. Rock cores from the Witham elbow area were classified as metasedimentary rocks (schist and phyllite) and felsic igneous rocks (monzodiorite, diorite and granite). Minerals identified in the igneous rocks included primarily biotite, muscovite and quartz. Pyrite was not observed in the cores of either igneous or metamorphic rocks in the Witham elbow area. Additionally, significant iron staining was not noted on fracture planes of the Witham Mountain cores. Iron staining on fracture planes is often an indication that iron-based minerals are present and in contact with ground water (or infiltrating surface water) migrating through the rocks.

The lack of sulfide minerals in these rock cores is supported by geologic literature published for the area. The geologic reference material for the Witham Mountain area, 'Metamorphic Stratigraphy, Petrology and Structural Geology of the Little Bigelow Mountain Area, Western Maine' Bulletin 24 by Gary Boone of the Maine Geological Survey (1973) notes that "both metapelite and metagraywacke vary slightly from bed to bed in terms of very minor amounts of pyrite".

Based on Summit's geotechnical investigation and geologic analysis, sulfide-based minerals were not identified in the bedrock core samples from the Witham Mountain area. As such, it is unlikely that acidic surface water runoff from newly exposed rock surfaces (blasting) or use of blasted rock (fill, rip-rap, gravel) would occur due to chemical interaction of precipitation and exposed rock.

If you have any questions concerning this letter, please feel free to contact me.

Sincerely,
SUMMIT GEOENGINEERING SERVICES

Michael A. Deyling, CG
President, Maine Certified Geologist

Appendix 12-5
Acid Rock Mitigation

Acid Rock Mitigation Plan

The following mitigation plan has been prepared for the Highland Wind Project.

Mitigation measures will deal with any acid generation potential associated with rusty-weathering, sulfide-bearing rock should this material be discovered during construction activities for the project. A variety of handling techniques and treatment methodologies are available for acid producing rock. In summary, these techniques include:

- Avoiding or minimizing the disturbance/excavation of acid producing rock
- Disposal of the material above the water table
- Surface and groundwater management to divert water away from acid producing rock and management areas
- Blending or alkaline addition to maintain the pH at near-neutral levels
- Identifying potential borrow sites for cover material
- Identifying potential borrow sites for the isolation or temporary storage of potential acid producing material
- Using low permeability and impermeable barriers to limit infiltration into the potentially acid producing rock from rainwater or groundwater
- Preparation of a logistics plan including sources for alkaline material and locations for the stockpiling of such material
- Identification of monitoring methods and locations to evaluate the effectiveness of the mitigation
- Contingency plans should initial mitigation require modification

The construction plan will be reviewed and adapted to allow initial construction activities to begin while further acid rock drainage (ARD) evaluation of any specific locations of concern is in progress. This is expected to include initial clearing and grubbing not requiring cut and fill operations into bedrock.

Sources of crushed limestone and agricultural lime to be used to neutralize potential ARD producing rocks are being researched. The limestone will be analyzed in accordance with appropriate procedures to evaluate its neutralization potential. In addition, borrow (deep till) areas are being identified on-site as a source of low permeability cover.