Section 1A
Alternatives Analysis

1.0 INTRODUCTION

Maine GenLead, LLC (Maine GenLead) is proposing to construct, own and operate a 115-kilovolt (kV) Generator Lead Transmission Line (the "transmission line" or "project") connecting the amended Oakfield Wind Project[1] in Oakfield, Maine to the ISO New England (ISO-NE) regional power grid via an existing substation in Chester.

1.1 PROJECT DESCRIPTION

The *Revised Oakfield Wind Project* includes a 115-kV electrical transmission line that will deliver electrical power from a substation located at the southeastern side of the amended Oakfield Wind Project to the substation in Chester. The Oakfield Wind Project is being amended through a separate application and will include the construction of 50 Vestas 3.0-megawatt (MW) turbines with a potential generating capacity of approximately 150 MW. Power carried by this project will tie into the Bangor Hydro Electric (BHE) Keene Road substation, which is connected to the ISO-NE electrical grid. Approximately two-thirds of the transmission line would parallel existing transmission lines, with 7 miles paralleling Line 56 in Chester and 33.8 miles paralleling, with minor deviations, the Maine Electric Power Company (MEPCO) right-of-way (ROW) from Chester to the Glenwood/Haynesville town line. The remaining distance would be new ROW that would generally follow a series of town boundaries to the Oakfield Wind Project. The ROW across the length of this Project will be between 100 and 200 feet wide, with tree clearing limited to between 35 feet and 130 feet depending on co-location with existing transmission lines. In total, the proposed transmission line is approximately 59 miles long and will travel through Oakfield, Linneus, T4R3 WELS, T3R3 WELS, Glenwood Plantation, Reed Plantation, North Yarmouth Academy Grant Township, Macwahoc Plantation, Molunkus Township, Mattawamkeag, and Woodville before terminating in Chester.

2.0 PROJECT PURPOSE AND NEED

2.1 PROJECT PURPOSE

The purpose of the Project is to deliver the expanded power output from the Oakfield Wind Project in Oakfield, Maine, to the New England electric market.

2.2 PROJECT NEED

The need for the additional renewable energy generated by the Oakfield Wind Project is discussed in the alternatives analysis in the accompanying amendment application for the generation facilities associated with the project. This alternatives analysis is limited to alternatives for delivering the power generated by the Oakfield Wind Project to the New England power grid.

Critical in the development of the amended Oakfield Wind Project is the need to deliver the generated power to the New England Power market. In order for the Oakfield Wind Project to be successful and economically viable, the applicant has determined that the energy must be directed south and into the ISO-NE grid. Maine GenLead evaluated the option for the Oakfield Wind Project to send power north and through the Maine Public Service (MPS) transmission system. Initially evaluated based on the smaller 51 MW Oakfield Wind Project, it was ultimately determined that the system did not have the capacity to transmit the additional power to the north from the expanded project. This is due in part to the equipment constraints of MPS, the current mix of generation and load on the system, the constraints of the connections between MPS and transmission service in New Brunswick, and the fact that New Brunswick closes one of the connections during the winter months for their own reliability purposes. Even if this

[1] On January 21, 2010, MDEP approved the application of Evergreen Wind Power II, LLC to construct and operate the 51-MW Oakfield Wind Project in Oakfield (DEP#L-24572-24-A-N/L-24572-TF-B-N). Evergreen Wind Power II, LLC, is in the process of submitting an amendment to the approved application, which changes the type of turbines and adds more turbines to the project to increase the potential generating capacity to 138 MW. Throughout this report, references to the Oakfield Wind Project are intended to refer to the Oakfield Wind Project Amendment as proposed by Evergreen Wind Power II, LLC.

option had been pursued, the costs of transmitting power to an advantageous market (e.g., ISO-NE) would have required the payment of transmission charges to move the power out of MPS service, through New Brunswick, and then south to the New England grid. The charges assessed for this "wheeling" of power through Canada back to the ISO-NE system, coupled with the limited space on the transmission system, make such a route impracticable. Therefore, it was determined that the power generated by the amended Oakfield Wind Project must be directed south to the ISO-NE Power Pool for the project to be viable. The Maine GenLead Project is proposed to directly serve this need. As a result, options for delivering power north were not further evaluated as part of the alternative analysis because they would not accomplish the project purpose.

3.0 ALTERNATIVES ANALYSIS

Maine GenLead has extensively examined practical alternatives in selecting routes for the Project. The objective of this analysis is to describe the screening process that led to the selection of the proposed transmission line route as the Least Environmentally Damaging Practicable Alternative (LEDPA).

According to the U.S. Army Corps of Engineers (Corps) Section 404(b)(1) Guidelines, 40 C.F.R. § 230.10, "[a]n alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." Likewise, Chapter 310 of the Maine Department of Environmental Protection (MDEP) rules, 06-096 CMR § 310(3)(R), defines "practicable" as "[a]vailable and feasible considering cost, existing technology and logistics based on the overall purpose of the project."

For each alternative presented below, a discussion is provided regarding feasibility, logistics, and potential environmental impacts. A number of options were reviewed with the ultimate goal of identifying an alternative that meets the project purpose and is the least environmentally damaging practicable alternative. As discussed more thoroughly below, the selected route is the most practicable route available when taking into consideration factors such as electrical grid connection, potential for natural resource impacts, accessibility, existing transmission infrastructure, cost, community and landowner impacts, and logistics of achieving the overall project purpose.

3.1 TRANSMISSION LINE ROUTE SELECTION

Maine GenLead undertook significant analysis to determine where the power generated at the Oakfield Wind Project would connect to the regional power grid. Potential alternatives were evaluated in terms of grid connection, landowner impacts, environmental impacts, and project cost. Each of these criteria is generally discussed below, followed by a discussion of how each alternative was evaluated based on those criteria and the process by which the preferred route was ultimately selected. Avoidance and minimization measures for the preferred route are provided in Section 4.0 below.

3.2.1 Route Selection Criteria

Grid Connection
Critical for any utility-scale wind power project is a connection to the electrical transmission grid that is reliable, secure, and can transmit the energy to an organized market. To meet the Maine GenLead project purpose, energy generated by the Oakfield Wind Project must be deliverable to the New England energy market. Note that only those alternatives that included the ultimate delivery of power directly to the ISO-NE grid were considered in this alternatives analysis. Delivering all of the power from the amended project to the north was ruled out as an alternative during the initial stages of investigation because it was determined that transmission service on MPS infrastructure could not be secured and the project would not be economically viable if all power was routed north.

Landowner Impacts
Landowner impacts refer to the ability to obtain ROW easements along a route and the potential impacts of locating a transmission line adjacent to abutting landowners (e.g., visual impacts). Since this project is a privately owned generator, it does not have the right of eminent domain and must rely on willing

landowners for route selection. Specific criteria used to analyze ROW acquisition issues include the number of parcels crossed by the ROW; direct impacts to landowners in close proximity to the ROW; willingness of underlying landowners to convey the necessary property interests; and the extent to which the transmission line corridor immediately parallels or travels within existing ROWs, roadways, railways, or other infrastructure.

Environmental Impacts
This criterion was applied to address environmental impacts as required by both the Corps Section 404(b)(1) Guidelines and Chapter 310 of the MDEP rules. Potentially suitable transmission line routes were evaluated for natural resource impacts using available information. Specific analysis criteria include impacts to existing land uses, the effect of each alternative on existing wildlife habitat, and the proximity of potential impacts to significant wetland resources, fisheries, and vernal pools. Maine GenLead also considered the types and classifications of waterbodies crossed and potential aesthetic impacts to area viewsheds.

Project Cost
For an alternative to be "practicable" under Corps and MDEP rules, the alternative must be available and capable of being done after taking costs, technology, and logistics into consideration. This criterion includes simple budget-grade estimates of construction and operation costs based on historical data. Factors affecting cost in this analysis include constructing transmission lines of various lengths, updating substations or other facilities, ROW acquisition, permitting, and design.

3.2.2. Route Selection Analysis

After factoring in all site selection criteria, Maine GenLead identified four potential alternatives, one of which being a no-build option. All four alternatives were extensively analyzed. An overview map of the area that identifies each proposed alternative is attached as Figure 1. An analysis matrix of all four options is presented in Appendix 1A-1. The four alternatives are as follows.

- Alternative 1 – includes the construction of a new substation in Haynesville, Maine, to tie into the 345-kV MEPCO transmission line. Alternative 1 would require 17.5 miles of a 115-kV transmission line north to a new substation at the Oakfield Wind Project.
- Alternative 2 – proceeds northeast from an existing BHE substation in Chester, Maine to the Oakfield Wind Project substation. This alternative consists of 60 miles of entirely new ROW through primarily undeveloped forest.
- Alternative 3 – proceeds northeast from an existing BHE substation in Chester, Maine, paralleling Line 56 and the MEPCO transmission line for approximately 41 miles to Glenwood, Maine. The line would then turn north and run approximately 17.5 miles to the Oakfield Wind Project substation. This alternative was identified as the LEDPA to meet the project purpose.
- Alternative 4 – No-build option.

3.2.3 Description of Route Alternatives

Alternative 1: MEPCO Transmission Line Tie in Haynesville, Maine
MEPCO is the owner of a 345-kV transmission line (Line 396) that runs from Orrington, Maine, to the New Brunswick border in Orient. MEPCO is owned by Central Maine Power Company (CMP), BHE, and MPS, with CMP being the controlling partner. The existing MEPCO transmission line passes through Haynesville, Maine, approximately 17.5 miles south of the amended Oakfield Wind Project location. This transmission line is a critical tie line between the ISO-NE transmission system and the New Brunswick transmission system.

Connecting the Oakfield Wind Project to the MEPCO 345-kV line in Haynesville would require the construction of a new substation in Haynesville. A new 115-kV transmission line would originate at this new proposed substation at the MEPCO line and extend approximately 17.5 miles northerly to the Oakfield Wind Project substation. The entire transmission line route would travel through new ROW (Figure 1 – "Alt. 1").

Grid Connection
The MEPCO line connects the ISO-NE transmission system to the New Brunswick transmission system. These two transmission systems are operated separately, but require a great deal of coordination to maintain a reliable and secure connection between the two systems. Depending on the load and generation mix between New England and New Brunswick, the flow of power, frequency, and voltage must be very carefully regulated. This alternative proposes to tap directly into the MEPCO line, and inject power into this delicate connection between the two systems. Under the ISO NE Minimum Interconnection Standards a new Generator that connects into the transmission system must maintain the full operational capability of any import tie in the electrical vicinity of its interconnection. Although it would be technically possible to connect into this line, in order to maintain the full capability of that line for imports, the Maine Gen Lead would have to then build additional transmission in addition to the Line 396 further into the ISO NE transmission system. This additional transmission would most likely look very similar to the chosen option of building directly to the Keene Road Substation in order to maintain that tie capability.

Landowner Impacts
The proposed transmission line would be within new ROW and would run through mostly undeveloped commercial forest. The number of affected parcels is low, and no houses would be directly impacted. The difficulty of land acquisition for new ROWs would be moderate due to the need to create a completely new corridor in an area where little development has occurred.

Environmental Impacts
Alternative 1 does not use existing ROWs or adjacent corridors. Because the proposed transmission line route to Haynesville extends through an undeveloped forest, Maine GenLead's analysis has concluded that wetland impact would be moderate. Access to the proposed transmission line is limited, but much of the area is actively harvested timberland with some existing access roads. Some new roads may be necessary to provide access to the new ROW. As with any transmission line, the new ROW would cause increased habitat fragmentation, which may have a negative impact on some wildlife species.

Project Cost
In addition to the construction of a new 115-kV transmission line from the Oakfield Wind Project to Haynesville, Alternative 1 would require the construction of a new substation to tie into the MEPCO transmission line. The cost of constructing a new substation for this purpose is moderate for a project of this scale. The total estimated construction cost of the new transmission line and substation for a connection to the MEPCO transmission line at Haynesville is approximately $80 million.

Alternative 2: BHE tie at Keene Road Substation via New ROW
Alternative 2 proposes to connect to the ISO-NE grid at an existing BHE substation on Keene Road in Chester (Keene Road Substation). This alternative proposes a new 60-mile long, 115-kV transmission line that would originate at the Keene Road Substation and extend northeast in new ROW to the Penobscot River in Mattawamkeag. The transmission line would parallel the MEPCO line for the river crossing, and then return to new ROW to tie into the Oakfield Wind Project substation. The Keene Road Substation is located approximately 50 miles (straight line) southwest of the Oakfield Wind Project (Figure 1 – "Alt.2"). The entire transmission line would travel through new ROW.

Grid Connection
This alternative proposes a grid connection location that allows the power generated at the Oakfield Wind Project to be transmitted directly to the ISO-NE power grid.

Landowner Impacts
The proposed transmission line would be within all new ROW and would run through mostly undeveloped commercial forest. The number of affected parcels is moderate based on the length of the line, but no houses would be directly impacted. The difficulty of land acquisition for new ROWs would be high due to the difficulty of siting the proposed alternative in virgin land. Landowners often insist on having a transmission line located on a particular portion of their property. Obtaining easements over a large number of properties that would allow a linear design is very difficult. Also, the need to obtain rights and create new access roads and a completely new corridor in an area where little development has occurred would increase landowner impacts.

Environmental Impacts
Alternative 2 does not use existing ROWs and is not adjacent to existing corridors. There is a strong regulatory preference for co-locating utility and other infrastructure corridors in order to minimize the impacts of habitat fragmentation and the increased visual and other impacts associated with multiple utility corridors located throughout the landscape. This preference for co-location is reflected most recently in the Legislature's passage of An Act Regarding Energy Infrastructure Development, which requires co-location of electrical transmission lines and other utility transmission infrastructure where feasible. See 35-A MRSA § 122(2)(D). The regulatory preference for co-location of transmission lines with existing corridors is also reflected in the MDEP's initial denial of a 345-kV transmission line that was not co-located with existing utility corridors, and its subsequent approval of a realignment of that same transmission line so that it was co-located with existing utility corridors for 84% of its length. See BHE, Findings of Fact and Order, L-17131-L6-G-N/L-17131-24-H-N.

Alternative 2 is located within undeveloped forest and because it is not co-located with existing utility or other rights-of-way, it would result in high levels of habitat fragmentation caused by the ROW and new access roads since the majority of the route is through undeveloped forest. The clearing of an approximately 100-foot wide corridor through forest land may impact wildlife species movement and increases edge effects on wildlife. As interior forest species move closer to the edges of these new habitats, they can become more vulnerable to predation and competition from species adapted to edge habitat. Increased edge habitat can also result in changes in micro-climate that can be harmful to some wildlife species. Cleared corridors represent a different habitat type than interior forest, and while some species will flourish, some species are not adapted to survive in these conditions.[2]

Wetland impacts along the length of the line would be moderate to high. Access to this proposed alternative is limited. A substantial new network of roads would need to be constructed in order to provide access for construction and maintenance of the new ROW, significantly increasing wetland and habitat impacts.

Project Cost
Alternative 2 would not involve the cost of a new substation, but would require upgrades to the Keene Road Substation to accommodate the additional power generated by the Oakfield Wind Project. Importantly, it would also involve the construction of approximately 60 miles of new 115-kV transmission line. Acquisition of access ROWs and construction of new access roads would also be required to complete the project, which would contribute to the costs of this alternative. The estimated project cost of Alternative 2 is approximately $50 million, which does not include substantial costs for access road acquisition and construction.

Alternative 3: BHE tie at Keene Road Substation via Collocation with MEPCO
Alternative 3 proposes to connect to the ISO-NE grid at the BHE Keene Road Substation in Chester. This alternative proposes a new 115-kV transmission line that would originate at the Keene Road Substation and extend approximately 59 total miles northeast to the Oakfield Wind Project substation. The transmission line would parallel Line 56 (Stetson Mountain Wind Project transmission line) from the Keene Road substation to the junction of MEPCO and Line 56. Alternative 3 would then parallel the

[2] Flatebo, G., Foss, C.R., Pelletier, S.K. (1999). *Biodiversity in the Forests of Maine* (C.A. Elliott, Ed.). Orono, ME: University of Maine Cooperative Extension. 108.

MEPCO line for approximately 34 miles to the Glenwood and Haynesville town line. It would then run in new ROW north to the Oakfield Wind Project substation (Figure 1 – "Alt.3"). Alternative 3 would parallel existing transmission line for approximately 41 of the 59 total miles. The MEPCO ROW is 200 feet wide and contains one existing 345-kV transmission line with room for one future line. As currently designed, the Maine GenLead transmission line would leave a corridor of uncleared ROW between the existing cleared MEPCO line and the proposed line. This uncleared ROW is owned by CMP, and with the MPC project proposed to occupy the remainder of the MEPCO ROW, Maine GenLead could not secure the rights to locate its line directly adjacent to the MEPCO line. It is expected that CMP will eventually construct a second 345-kV line in this space, resulting in one cleared ROW containing 3 transmission lines with an approximate total cleared width of 320 feet.

Grid Connection
The Keene Road Substation is a part of the ISO-NE transmission system and will be a direct connection into the ISO NE energy market. There are several transmission paths that the power can take from this interconnection point, and this option offers much better reliability and security than the MEPCO tap. ISO-NE is studying the impacts from this interconnection point, but preliminary results show no significant impact to the electrical grid.

Landowner Impacts
From the Oakfield Wind Project to the MEPCO line in Haynesville, the proposed line would be located along the town boundary as shown on Figure 1. This portion of the proposed transmission line would be in all new ROW and would run through mostly undeveloped commercial forest. The number of affected parcels is low, and no houses would be directly impacted. With the ROW mostly located along the town boundaries, individual parcels for the most part are not bisected by the new ROW, reducing impacts to the landowners. Nonetheless, the difficulty of land acquisition for new ROWs would be moderate due to the need to create a completely new corridor in an area where little development has occurred. Alternative 3 then turns southwest and directly parallels either the MEPCO or Line 56 ROW. Landowner impacts would be low for this section, as it would be adjacent to an existing ROW, and with few exceptions would not result in additional division of private land.

Environmental Impacts
Because Alternative 3 proposes a combination of new ROW and co-location with existing utility corridors, environmental impacts are expected to be moderate. In the area of new ROW, habitat fragmentation would occur as a result of the new ROW, and tree clearing and wetland impacts are considered to be moderate. Where the proposed corridor parallels MEPCO/Line 56, environmental impacts and fragmentation would be significantly reduced. The MEPCO transmission line was constructed over 40 years ago; therefore, wildlife species currently present in this area have adapted to the presence of this cleared corridor. Interior forest species would likely not be common in the area of new ROW, as this area is currently edge habitat. Co-location of new transmission lines with existing lines is considered a priority for natural resource regulatory agencies for these reasons. Impacts to wildlife are reduced, and the presence of fragmenting development is concentrated along one geographical corridor. Aesthetic impacts would be low on this alternative also due to the inaccessibility of the new ROW section and the co-location with the existing transmission lines for the remainder of the line. Access to the northern portion of this alternative line is limited; therefore, a new network of roads would need to be constructed to provide access to the new ROW in this area. The portion of the line that parallels MEPCO/Line 56 has very good access, and a substantial amount of new roads would not be required. Additionally, in the area where Alternative 3 parallels Line 56, clearing impacts would be reduced due to the direct co-location with Line 56. Clearing would be reduced to 50 feet in many areas, as the Alternative 3 ROW will overlap with the existing cleared area for the Line 56 ROW. In summary, Alternative 3 is co-located with existing utility corridors for approximately 41 miles, with minor deviations, and therefore avoids the environmental and visual impacts associated with construction of substantial distances of new corridor.

Project Cost
Alternative 3 would include the construction of a new 115-kV transmission line from the Oakfield Wind Project to Chester, along with upgrades to the Keene Road Substation to accommodate the additional power generated by the Oakfield Wind Project. Land acquisition costs are expected to be low in this

alternative because the proposed ROW is adjacent to an existing ROW. The northern portion of the line would require new access roads. Access is considered to be good for the portion of the line that parallels MEPCO/Line 56. The estimated project cost of Alternative 3 is $61 million.

Alternative 4: No-build Option

A no-build alternative runs counter to the purpose and need of the Project, and is considered to be a non-practicable alternative. The no-build alternative is not a viable option because it does not accomplish the project purpose, nor does it address the project need. Without the Maine GenLead Project, there will be no conduit to deliver electricity from the Oakfield Wind Project to consumers. The construction of the Oakfield Wind Project is satisfying the goals of the Regional Greenhouse Gas Initiative and the State of Maine's wind energy task force. However, without the construction of a transmission line to deliver the power to the ISO-NE electricity grid, the Oakfield Wind Project would not be constructed and would not contribute to meeting these goals.

3.2.4 Comparative Analysis of Route Alternatives

Maine GenLead identified and evaluated a total of three alternatives (excluding the no-build option) for connecting the power generated by the Oakfield Wind Project to the regional power grid. To evaluate the grid connection possibilities, Maine GenLead identified specific criteria to assess and compare the various alternatives. Each route was evaluated in terms of grid connection, landowner impacts, environmental impacts, and project cost. These criteria were used to facilitate comparisons among the various alternatives and as a macro-analysis evaluation tool to assist in identifying the preferred connection location and route. (See Attachment 1)

Utilizing the information in Section 3.2.3 above, this section discusses each alternative based on the four criteria to select the preferred route.

Grid Connection

To be commercially viable, power generated by the Project must be delivered directly to the ISO-NE electric grid. As described in the Project Need above, Maine GenLead investigated sending the power north to the MPS transmission system. It was determined that there was not enough capacity to handle the additional power generated by the Oakfield Wind Project. The need to build out additional capacity on the Line 396 tie-line with New Brunswick makes Alternative 1 the least desirable of the three alternatives. Alternatives 2 and 3 both deliver power directly to the ISO-NE grid, with direct ties to the BHE substation in Chester. For the purposes of grid connection, Alternatives 2 and 3 are considered to be equal.

Landowner Impacts

Alternative 1 would have the lowest impacts to landowners, primarily because the length of the transmission line is significantly shorter than the other two alternatives. Also, development is relatively sparse in the area of the Alternative 1 transmission line, consisting primarily of commercial forestry land. Alternative 2 would have a high impact to landowners because it consists of entirely new ROW and is the longest of the three alternatives. While there are few residences directly affected by this transmission line route, the alternative crosses a large number of properties, and it is expected that land acquisition across the length of the line would be difficult for this alternative.

Alternative 3 would have moderate landowner impacts. Impacts to landowners would be low along the northern portion of the line where it runs through relatively undeveloped commercial forest. From Glenwood to Chester, Alternative 3 primarily parallels the existing MEPCO and Line 56 transmission lines. Adding a second ROW where a transmission line already exists would have less landowner impact than cutting a new ROW through undeveloped land.

Environmental Impacts
Alternative 2 would have the highest environmental impact. That route would require new ROW through undeveloped forest, resulting in a relatively high degree of fragmentation and tree clearing. The new ROW would result in substantial wetland conversion from forested wetland systems to emergent/shrub wetlands. This conversion can potentially negatively impact rivers and streams, increasing thermal insulation and reducing the quality of fish and shellfish habitat. Alternative 2 is also the longest of the three build-alternatives, resulting in the most amount of tree clearing. The entirely new ROW would also fragment a large area of relatively unfragmented forest, which may have detrimental impacts to some wildlife species. Increased risk of predation and competition, increased edge effects, and barriers to wildlife movement and migration would all result from the fragmentation resulting from this new ROW. Some wildlife species, particularly small carnivores (e.g., pine marten [*Martes americana*]), require large tracts of contiguous forest for survival. These forest interior species require the inner portions of large territories because their preferred food source is only present at some distance from the forest edge.[3] The creation of additional edge habitat can also increase species crowding and can focus more individuals into a remaining forest tract, which increases competition and may disrupt nesting behavior and success. Mature forest species are often less mobile, less adaptable, and have a more limited ability to disperse.[4] Therefore, fragmentation can limit the movement of these species, inhibit their reproductive capabilities, and potentially displace them altogether. Alternative 2 is also the least accessible of the alternatives; therefore, a new network of access roads would be needed to provide construction and maintenance access to the new ROW, resulting in additional clearing, further fragmenting the landscape.

Alternative 1 would have the lowest wetland impact because it is the shortest route and would require the least amount of tree clearing. While Alternative 3 would have comparatively moderate wetland impact based on the length of the line, tree clearing would be less than on Alternative 2 due to the co-location of the line with existing transmission lines. In areas where Alternative 3 is co-located with Line 56, as little as 25 additional feet will be cleared for construction of the new ROW. Alternative 3 would be co-located with the MEPCO line for approximately 41 miles of its total length. While the current design would leave 55 feet of uncleared ROW in places between the two lines, that design is intended to allow for the construction of a future 345-kV transmission line. That potential 345kV line, should it be built, would be located between the existing MEPCO line and the proposed Alternative 3, and tree clearing for this future line would be limited to just this 55 feet of ROW. By combining these three ROWs into one corridor, overlap allows for the total tree clearing to be reduced (i.e., as compared to having three separate ROWs). Ultimately, the placement of Alternative 3 would not cause additional habitat fragmentation as compared to Alternative 2.

Project Cost
Despite being the shortest route, Alternative 1 would cost approximately $80 million due to the need to construct a new substation to tie into the MEPCO line and an additional line to Chester. This cost does not take into account fees that may be incurred by connecting to the MEPCO line, which would further increase costs for that alternative. Alternatives 2 and 3 are estimated to be similar in cost. However, the cost of Alternative 2 does not include the additional task of access road construction, which would be substantial on this alternative, with the greatest amount of new access road of the three alternatives.

3.2.5 Selection of Preferred Alternative

Based on the information provided above, Maine GenLead selected Alternative 3 as the LEDPA. Alternative 1 was ruled out primarily based on the need to build additional capacity that would have greater costs and impacts compared to the option chosen. Once the option of tying into MEPCO was dismissed, Maine GenLead then focused its evaluation on Alternatives 2 and 3, which both deliver power directly to the Keene Road Substation in Chester. Between these two alternatives, Alternative 3 is the least environmentally damaging. Alternative 2 involves 60 miles of new ROW, which would result in habitat fragmentation, increased aesthetic impacts, and greater tree clearing. Conversely, Alternative 3 is

[3] Flatebo, G., Foss, C.R., Pelletier, S.K. (1999). *Biodiversity in the Forests of Maine* (C.A. Elliott, Ed.). Orono, ME: University of Maine Cooperative Extension. 108.
[4] Id. 110.

largely co-located with an existing transmission line ROW, which would result in less habitat fragmentation, reduced aesthetic impacts, and fewer landowner impacts. Alternative 3 is also one mile shorter than Alternative 2, and has ready access for most of its length, which equates to lower wetland impact, lower cost, and less tree clearing. As a result of these factors, Maine GenLead selected Alternative 3 as the Preferred Alternative and the LEDPA.

4.0 AVOIDANCE AND MINIMIZATION

Once Alternative 3 was chosen as the preferred route, efforts were focused on refining that route to provide the most economically feasible and environmentally sound option. Wetland impacts, land availability, engineering and design constraints, and economics were the key variables used to evaluate different options. Matrices setting forth the relative impacts and merits of alternative routes within Alternative 3 are included as Appendices 1A-1 and 1A-2.

4.1 AVOIDANCE

The principal benefits of the route of Alternative 3 are that it delivers power directly to the ISO-NE pool and is co-located with existing transmission lines for approximately 41 miles of its total length. For the purposes of this alternatives analysis, the route followed by Alternative 3 has been broken down into three geographic sections for discussion of avoidance and minimization efforts. These sections were divided as follows:

- Section A consists of the route from the Keene Road Substation to the Penobscot River;
- Section B consists of the route from the Penobscot River crossing in Mattawamkeag to the Glenwood/Haynesville town line; and
- Section C consists of the route from the MEPCO transmission line in Glenwood/Haynesville to the Oakfield Wind Project.

The following figures are referenced in this discussion of the analysis of route selection:

- Figure 1 Map showing entire proposed route from the Keene Road Substation to the Oakfield Wind Project substation;
- Figure 2 Enlarged map of the proposed route showing alternatives in Section A;
- Figure 3 Enlarged map of the proposed route showing alternatives in Section C; and
- Exhibit 1 of the application, the plan set of the entire route.

Section A –Keene Road Substation to the Penobscot River
Two major alternatives were evaluated in this section (Figure 2). An analysis matrix of these two alternatives is presented in Appendix 1A-2.

A-1 – Co-locate with the existing MEPCO right-of-way – 6 miles
Alternative A-1 would parallel the existing MEPCO transmission line ROW from the Keene Road Substation to the Penobscot River. This alternative would require a new 100-foot ROW. It would be co-located with the MEPCO line, which would reduce the environmental impacts of habitat fragmentation and visual impacts. This route contains significant wetland resources in the area that would be the new 100-foot ROW.

A distinct disadvantage to this alternative is the fact that Maine GenLead could not secure proper title, right, and interest to the south of the junction with Line 56. Maine GenLead identified this as a potential constraint in utilizing this ROW. Clearing impacts along this alternative would also be higher than on Alternative A-2, as discussed below.

A-2 – Co-locate with Line 56 to the junction with the MEPCO line, then follow MEPCO to the Penobscot River – 7 miles (Preferred Option)

Alternative A-2 would be co-located with the Line 56 ROW until the junction of Line 56 and the MEPCO ROW, at which point the Maine GenLead line would parallel MEPCO to the Penobscot River. Similar to option A-1 described above, this option would parallel an existing transmission line, which would reduce habitat fragmentation and impacts to aesthetics. Wetland and vernal impacts would be less than option A-1.

Based on the co-location agreement between the Project and Line 56, clearing impacts will be substantially reduced along this section of the route. Where the Project and Line 56 are immediately adjacent, the collocation agreement allows the lines to be much closer together, which will reduce clearing impacts to as little as 35 feet of new cleared ROW, as compared to co-locating with the MEPCO line which would require approximately 100 feet of new cleared ROW. With reduced clearing, this option had much smaller environmental impacts, and it was chosen as the preferred alternative.

In addition to the two major alternatives considered for this section, location-specific measures were implemented to avoid resource impacts. Impacts to a significant vernal pool and its habitat were avoided between poles sets #10 and #11, near Keene Bog, by significantly increasing the pole heights and doubling up the poles (Exhibit 1, Map 3). This solution was achievable due to the lower height of the trees in the significant vernal pool habitat. On the west side of the Penobscot River crossing, the pole set was moved as far from the river as possible in order to avoid floodplain wetlands and clearing in those wetlands (Exhibit 1, Map 17).

Section B –Penobscot River to the Glenwood/Haynesville Town Line

Through this section of the Maine GenLead Project, the proposed transmission line parallels the MEPCO corridor from the Penobscot River to the Glenwood/Haynesville town line. With only a few minor exceptions, the Maine GenLead transmission line will run adjacent to the MEPCO ROW. The deviations from the MEPCO corridor were caused by the inability to obtain an easement for the transmission line over particular properties. Co-location of transmission corridors minimizes forest fragmentation, new access ways and visual impact, and a preference for co-location is reflected in MDEP and Corps policies for linear projects. On this basis, it was determined that directly following the MEPCO corridor represented the LEDPA for this section.

This section also includes the crossing of the Penobscot River in Mattawamkeag. As described above, it was determined that collocation of the proposed Maine GenLead line with the MEPCO for the crossing represented the LEDPA in this area. New crossings of the river were immediately determined to be non-viable options based on the likely concern from state and federal regulatory agencies and from the Penobscot Indian Nation. Collocation of river crossings is the generally approved LEDPA, as it results in fewer impacts to wildlife (primarily birds such as bald eagles [*Haliaeetus leucocephalus*] and osprey [*Pandion haliaetus*]) and aesthetics. An intensive field evaluation for potential archaeological resources was conducted at the chosen crossing; no resources were identified.

In order to avoid two significant vernal pools near an area where the line had to depart the MEPCO corridor (Exhibit 1, Map 27, 28), the transmission line was redesigned to avoid all impacts to the significant vernal pools and their habitat. This solution was achievable due to the willingness of the landowner to relocate the agreed upon corridor location.

In order to further minimize Impacts to four significant vernal pools and their habitats the transmission line is designed with significantly taller poles in a horizontal configuration between poles sets #319 - #320 (Exhibit 1, Map 30); #332 - #333 and #335 - #336 (Exhibit 1, Map 31); #489 - #490 (Exhibit 1, Map 45). By significantly increasing the pole heights and going to a horizontal configuration the significant vernal pools and their habitats will remain intact, with only select tree cutting and tree topping.

Section C –MEPCO transmission line in Glenwood/Haynesville to the Oakfield Wind Project
Three major alternatives were evaluated to bring the Maine GenLead transmission line to Glenwood Plantation or Haynesville to parallel the MEPCO transmission line (Figure 3). An analysis matrix of these two alternatives is presented in Appendix 1A-3.

C-1 – Glenwood Option – 21 miles
Alternative C-1 would start at the MEPCO line near Dixie Road in Glenwood Plantation and run north to the Oakfield Wind Project roughly through the center of T4R3 WELS and T3R3 WELS. Alternative C-1 spans a distance of approximately 21 miles.

This option would involve the construction of a new ROW through mostly undeveloped forest. Wetland delineations and vernal pool surveys were performed on this route, and no substantial differences were found between this and the other two options. Landowner impacts would be relatively low on this corridor, but the proposed route would bisect several large parcels. The Glenwood Option would also result in habitat fragmentation through the creation of a new cleared ROW through undeveloped forest. Tree clearing would also be high along this proposed route.

After further investigation following natural resource surveys along this route, landowner conflicts were raised that made this line a non-viable alternative. Acquisition and construction of an ROW on this route was determined to not be practicable.

C-2 – Town Line Option – 17.5 miles (Preferred Option)
Alternative C-2 would start at the MEPCO transmission line at the Glenwood and Haynesville town line and run north along the eastern boundary of Glenwood Plantation, T3R3 WELS, and T4R3 WELS. The option then turns briefly east and crosses into Linneus, running along the western boundary of Linneus before crossing back into Oakfield. The line would then run west to the Oakfield Wind Project substation. This alternative route spans a distance of approximately 18 miles.

Alternative C-2 would involve the construction of a new ROW primarily through undeveloped forest, which would result in habitat fragmentation, relatively high amounts of tree clearing along the route and bisecting an identified streamshore ecosystem. This alternative is the shortest of the three options investigated for this section of the transmission line route. Alternative C-2 would likely have a lower impact on landowners as the route is proposed to be located along the town line, thereby not bisecting any large parcels with the new ROW. Disturbance to individual parcels would be mostly limited to boundaries of landowners' property. Cost of options C-1 and C-2 were not formally evaluated, but it is estimated that C-2 would be less expensive due primarily to it being shorter.

This route was deemed to be the most viable of the three options, and it became the preferred option of the Project.

C-3 – Bridal Path Option – 20 miles
Alternative C-3 would run north from the MEPCO transmission line in Haynesville along the Bridal Path, an existing ROW that runs from Haynesville to Houlton. The Bridal Path ROW is cleared of overstory vegetation to 75 feet, but does not currently contain an existing transmission line. Option C-3 would follow the Bridal Path north through Forkstown Twp, TAR2 WELS, and into Linneus, where it would turn west and run to the Oakfield Wind Project substation. The Bridal Path ROW is being considered for a 345-kV transmission line to be constructed as part of the MPC project. MPC is a joint program of MPS and CMP to study the economic and reliability benefits of connecting the MPS transmission system to the ISO-NE grid. Alternative C-3 would result in a total route distance of approximately 20 miles.

Upon investigation, Maine GenLead was not able to secure title, right, and interest on the Bridal Path ROW. There were also questions regarding the status of the title on the ROW, and the ability to resolve the title issues in a timely manner. The option of paralleling the Bridal Path was also investigated. However, it was determined that because of the title uncertainties and the encroaching landowners, obtaining rights to the Bridal Path or an adjacent ROW would not be feasible at this time.

Review of Preferred Route

The Preferred Route chosen for the Maine GenLead Project follows a combination of the alternatives outlined above (A-2 and C-2) and is a total of 59 miles in length. The route begins at the Keene Road Substation and follows the Line 56 ROW to the junction with the MEPCO ROW. The route will then follow the MEPCO ROW northeast to the Penobscot River. This section (Section A) will consist of a newly cleared ROW that will parallel ROWs (Line 56 and MEPCO) that contain existing transmission lines. This route was chosen based on an analysis of impacts of fragmentation on wildlife, wetland impacts, aesthetics, easement availability, and landowner concerns. As a result of careful design, there are no permanent fill impacts to vernal pools or streams; no poles are within 40 feet of any stream; and wetland impacts are minimized. Finally, the clearing is reduced for the segment that is adjacent to Line 56.

On the north side of the Penobscot River, the Preferred Route continues to parallel the MEPCO ROW to the Glenwood/Haynesville town line, with minor (i.e., 1 to 2 miles in length) deviations from the MEPCO ROW to accommodate landowner issues and environmental concerns. This section (Section B) will consist of newly cleared ROW that will parallel the MEPCO ROW, which contains an existing 345-kV transmission line. Note that the full width of the MEPCO ROW is not currently cleared, and a portion of the MEPCO ROW will remain forested to allow for the eventual construction of the MPC 345-kV transmission line. This route was chosen primarily to avoid impacts from habitat fragmentation that result from the construction of new ROWs through undeveloped areas. Paralleling an existing transmission line also decreases visual impacts and landowner concerns by not further fragmenting the landscape.

In Glenwood, the route then turns north and runs north along the eastern town line of Glenwood, T3R3 WELS, and T4R3 WELS, with only minor deviations off the town line. The route then crosses the T4R3 WELS town line and runs north along the western boundary of Linneus. In Linneus, the line turns west and runs to the Oakfield Wind Project substation. The total distance of this section is 18 miles. This section (Section C) consists of new ROW to be cleared through relatively undeveloped forest land, owned by a combination of small landowners and commercial forestry companies. This route was chosen because the option of following the existing Bridal Path ROW was not viable, and landowner impacts were reduced by following the town line instead of cutting through the center of parcels. It was also the shortest of the three options reviewed to bring the Maine GenLead line from the MEPCO line to the Oakfield Wind Project.

Summary

The Preferred Route was chosen based on diligent attempts to avoid impacts to wildlife habitat, sensitive wetland areas, landowners, and cultural assets, as well as to minimize visual impacts. Significant emphasis was also placed on securing a route that would be economically feasible and would meet the project purpose of delivering power to the ISO-NE grid in a cost efficient manner. As the figures and matrices illustrate, many variables and options were considered to choose a route that best blends the needs of the project with the need to minimize impacts.

4.2 MINIMIZATION

The most important means of minimizing wetland impact during construction of the transmission line is to complete significant portions of the project during frozen conditions. In the event winter construction is restricted due to time or weather constraints, this application is structured to show impacts anticipated during summer construction. Therefore, temporary impacts are anticipated to be significantly less than those presented in this application.

There are also five other key parameters in minimizing impacts, including work-arounds, Significant Vernal Pool clearing, access to the transmission line, placement of poles, and construction sequencing.

4.2.1 Work-Arounds

In order to establish a more viable route, the overall path of the transmission line was slightly shifted in several locations. These minor shifts, commonly referred to as "work-arounds," moved the preferred route off of the general path described above to reduce environmental impacts, or around properties where an easement could not be obtained. There were a total of six work-arounds across the length of the preferred route, two along the town line option and four along the MEPCO ROW. In these six areas, the proposed ROW will deviate slightly from the preferred option in order to address the following issues: minimize impacts to the 250-foot buffer surrounding significant vernal pools (Exhibit 1, Map 27), poor crossing alignment at a major stream crossing (Exhibit 1, Map 52), and inability to obtain landowner consent to run the transmission line on the property (Exhibit 1,Maps 23-26; 27-28; 35-37; 60-61).

Impacts to Significant Vernal Pool Buffers
Natural resource surveys in Macwahoc Plantation resulted in the identification of three Significant Vernal Pools within close proximity along the proposed transmission line route. Two of these pools were located along another work-around that had been designed to avoid a landowner who was unwilling to provide Maine GenLead with the rights to use the property. Impacts to the Significant Vernal Pool buffers could not be minimized through the creative use of pole placement or other design criteria due to the close proximity of all three pools. Therefore, in order to avoid substantial impacts to these Significant Vernal Pool buffers, a new work-around was created that avoided the pools and reduced environmental impacts.

As shown on Figure 4, the work-around will result in greater wetland impacts than the original corridor alignment. However, the 250-foot buffers surrounding three Significant Vernal Pools will all be avoided based on this change in corridor location. The applicant determined that additional wetland impact was preferable to impacts to the significant vernal pool depressions and their terrestrial buffers. Impacts to the wetlands in the new corridor will be minimized through the use of pole placement and other design strategies.

Structure type, size and placement around all Significant Vernal Pools are designed to avoid as much clearing as possible. Spans over the Significant Vernal Pools and their 250-foot buffer zones are designed to minimize impact as much as topography and pole sizes will allow. The height of the proposed structures and horizontal configuration allow most trees to remain with only selective cutting and some requiring tree topping to acceptable heights with some growth room.

East Branch Mattawamkeag River Crossing
The Town Line option of the preferred route includes a crossing of the East Branch of the Mattawamkeag River. However, along the town line between T3R3 WELS and Forkstown, the River is running parallel to the town line. As originally designed, the route included a span of the River that would have been over 1,000 feet in length and would have run down the center of the main channel of the river. While the large span created an engineering challenge, the prospect of a transmission line paralleling the river created wildlife and visual impacts that were not desirable. Maine GenLead then re-routed the line to the west so that it crossed the River at a right angle to the flow of the River, resulting in a crossing distance of approximately 150 feet (Figure 5). This drastically reduced the environmental impacts associated with this crossing, and also allowed for a feasible engineering solution.

Landowner Work-Arounds
In four locations along the preferred route, there are landowners unwilling to provide Maine GenLead with the rights to utilize their property for the construction of a new transmission line. In these areas, Maine GenLead worked with adjacent landowners to secure a path for the ROW across their land. While these work-arounds were not performed for environmental reasons and required departing from the adjacent utility corridor, they were essential to create a route that was feasible.

4.2.2 Significant Vernal Pool Clearing

In order to reduce impacts to Significant Vernal Pools located along the transmission line, modifications to the transmission line design were made for the 250-foot buffers surrounding those Significant Vernal

Pools that are located in forested wetlands. To keep the habitat intact around these pools, no clearing will be performed within the 250-foot buffer surrounding seven Significant Vernal Pools: SVP07TT_N in Chester, SVP24-1MA_N, SVP62AA_N, and SVP59AA_N in Macwahoc, and SVP23DD_N, SVP65AA_N, and SVP46ED_N in Glenwood. Additionally, no transmission line poles will be located within the 250-foot buffers of these seven pools.

To achieve this, the applicant is proposing to use taller and larger pole structures than the standard size used along the remainder of the transmission line to allow for greater height and longer spans for the lines. These taller structures will give the wires approximately 50 feet of clearance above the ground, allowing for the vast majority of species to remain standing with almost no need for additional clearing. Occasional large trees will need to be cleared within the 250-foot buffers in order to avoid contact with the wires. This selective clearing will be performed by hand and will not be performed between April 1 and June 30. These efforts will greatly benefit these seven Significant Vernal Pools located along the transmission line. By vastly reducing the amount of clearing within the 250-foot buffers of the pools, the impacts to these valuable habitats will be considerably reduced.

4.2.3 Access to Transmission Line

To address equipment and material access to the proposed transmission line, reconnaissance work was completed during the resource inventory to locate existing roads and infrastructure. The timber industry is active in the Project area, and many existing haul roads will be utilized during construction to minimize impacts. Upgrades to the haul roads would be generally confined to the existing footprint of the road. These improvements would be consistent with similar road improvements routinely performed by the timberland owners themselves in the process of timber harvesting. Exhibit 2 provides detail of the access plans for construction and maintenance of the Maine GenLead project.

Additionally, a large percentage of the preferred route runs parallel to the MEPCO and Line 56 ROWs, which have several associated access roads (Exhibit 2). While many of these roads now serve multiple purposes (e.g., timber harvesting access, private camp roads), many of the roads can be utilized to access the proposed transmission line corridor with only minor upgrades. Maine GenLead, or the construction contractor, plans to utilize these existing roads as much as possible to minimize impacts. In areas where existing roads are not present or where the construction of new roads would result in significant clearing or wetland impacts, the construction contractor may be able to utilize the existing cleared ROWs to access the Maine GenLead line. This is another benefit of co-locating the route with existing ROWs. While some temporary wetland impacts still result from using the cleared ROWs, clearing impacts would be negligible.

Access to each pole can come from one of four directions: from the proposed ROW, from the adjacent pole in either direction, from the adjacent property, or from the adjacent ROWs. In most locations, the ROW will include a temporary 16-foot travel lane within the corridor to provide necessary access during construction. This intended access is shown on the plans coming from the direction that creates the least amount of disturbance to resources such as wetlands (Exhibit 1). In some cases where existing roads or other features are adjacent to the pole location, attempts are made to access the pole directly from that access rather than along the ROW. Where access along the new ROW or from the adjacent property is not feasible, access from the adjacent ROWs may be possible. By delineating the proposed access on the plans, Maine GenLead has attempted to minimize impacts and suggest a reasonable access point to the contractor. Actual routes to each pole will have to be determined in the field by the resident engineer and contractor with consultation from the Third Party Inspector. The plans are intended to show the maximum potential impact and most likely means of access. The plans are not intended to show the only reasonable upland access.

4.2.4 Pole Placement

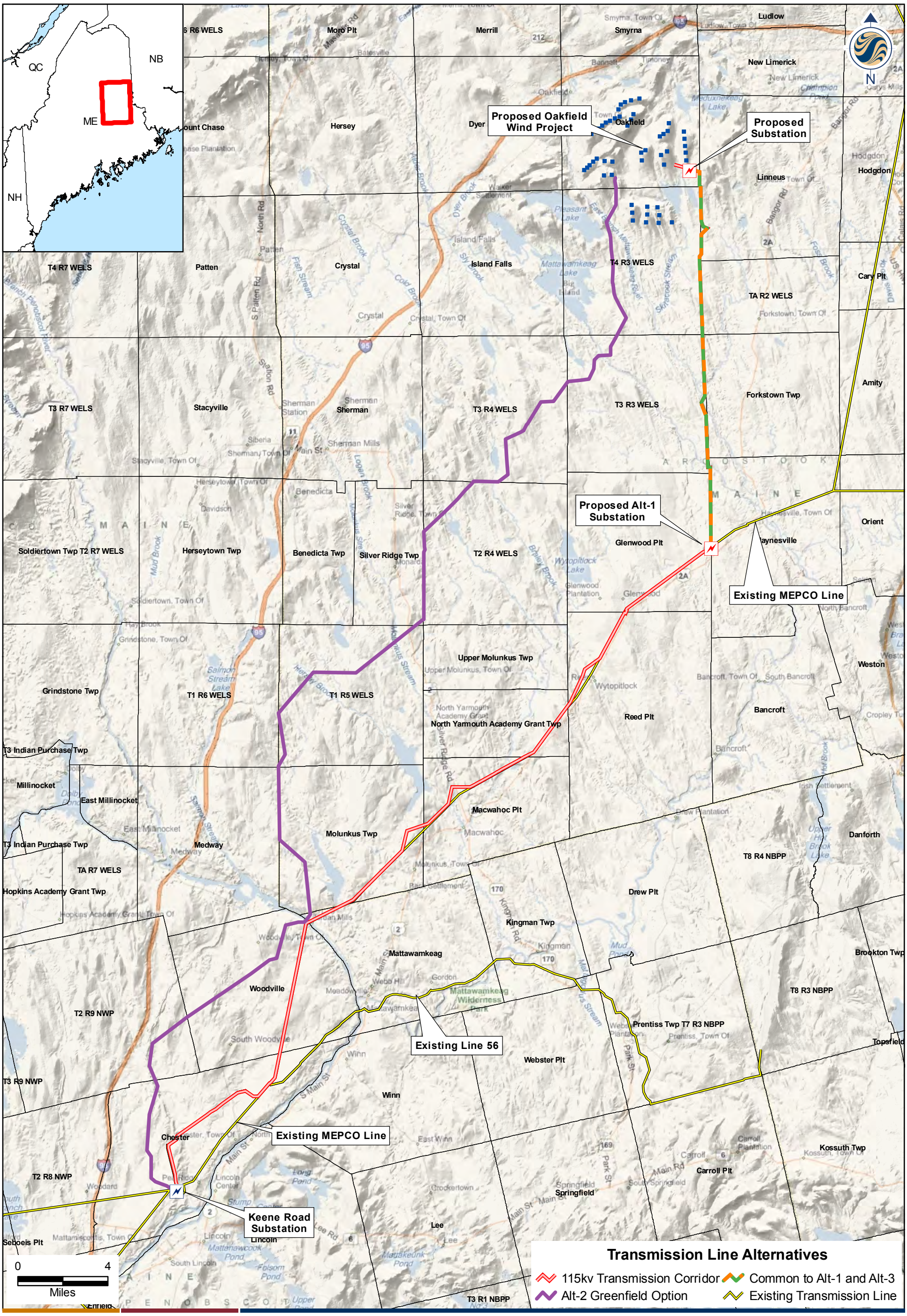
Individual pole locations were carefully laid out. The layout was examined, checked, and readjusted to minimize environmental impacts. The size of some wetlands, topography, angles, and length of spans were engineering limitations that factor into the effort to avoid placing poles in wetlands. Where

technically feasible, spans were increased and larger structures were used to avoid impacts. Structure locations and construction access roads avoid vernal pools, mapped Significant Wildlife Habitat, and rare, threatened or endangered (RTE) plant locations.

4.2.5 Construction Sequencing

Finally, construction sequencing is planned to minimize the need for temporary fill. Maine GenLead has analyzed the portions of the line that have the highest proportion of wetlands and will focus on construction of those portions during frozen ground conditions. Low-ground pressure and tracked vehicles will be used in sensitive areas to minimize wheel rutting and erosion. Where possible, sensitive areas will be bridged. This will minimize the need for temporary fill. In areas where bridging is not possible or frozen conditions are not sufficient to prevent ground disturbance, temporary wetland fill will be required. Wooden mats will be used in these instances to create a travel way for equipment to prevent rutting.

Figures



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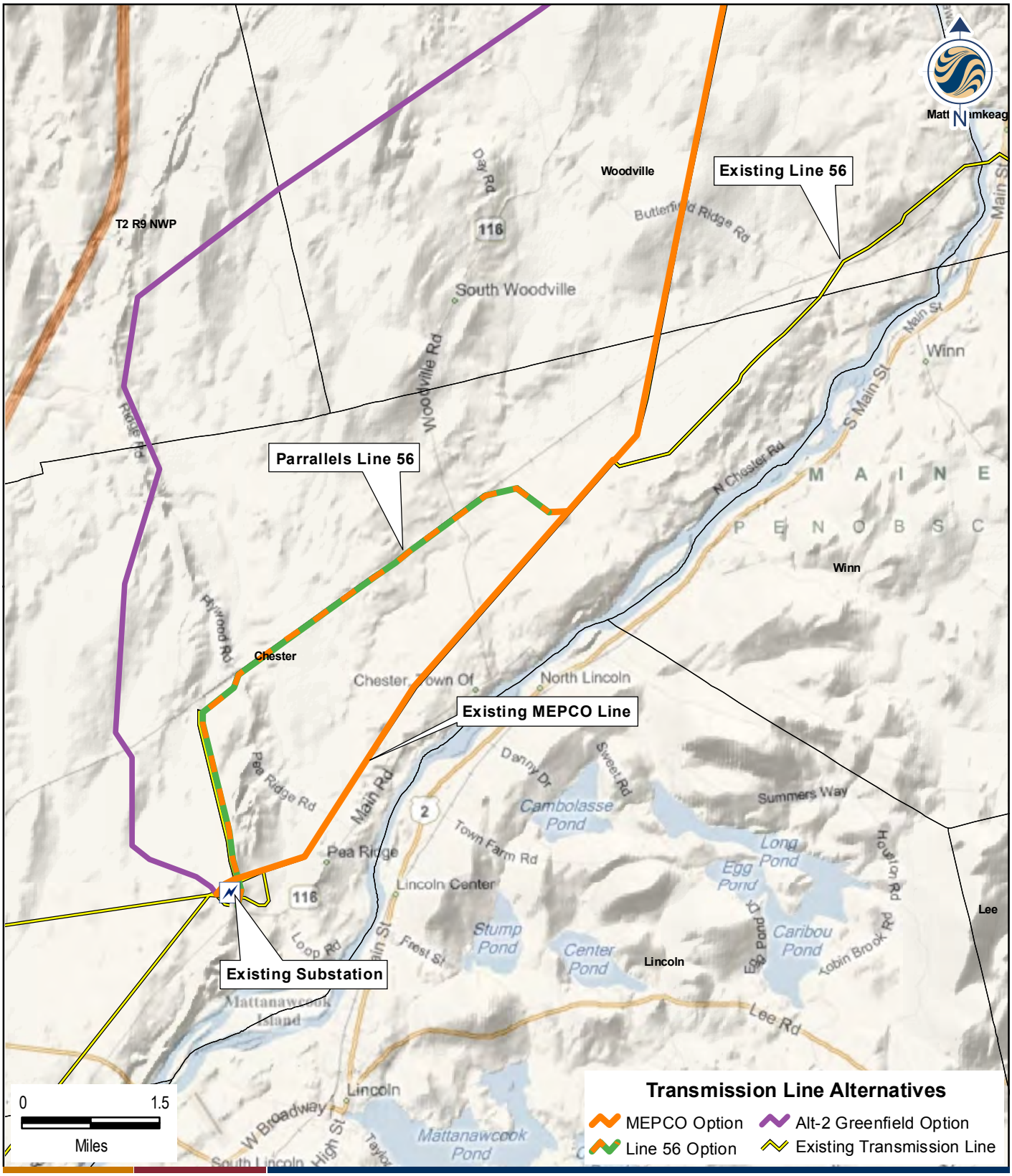
Note:
1. Existing transmission line was digitized by Stantec using the NAIP 2009 aerial image for Aroostook County.

Client/Project
Maine GenLead 115kv Transmission Line
Oakfield, Maine

Figure No.
1

Title
Transmission Line Route Alternatives Overview

May, 2011



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Note:

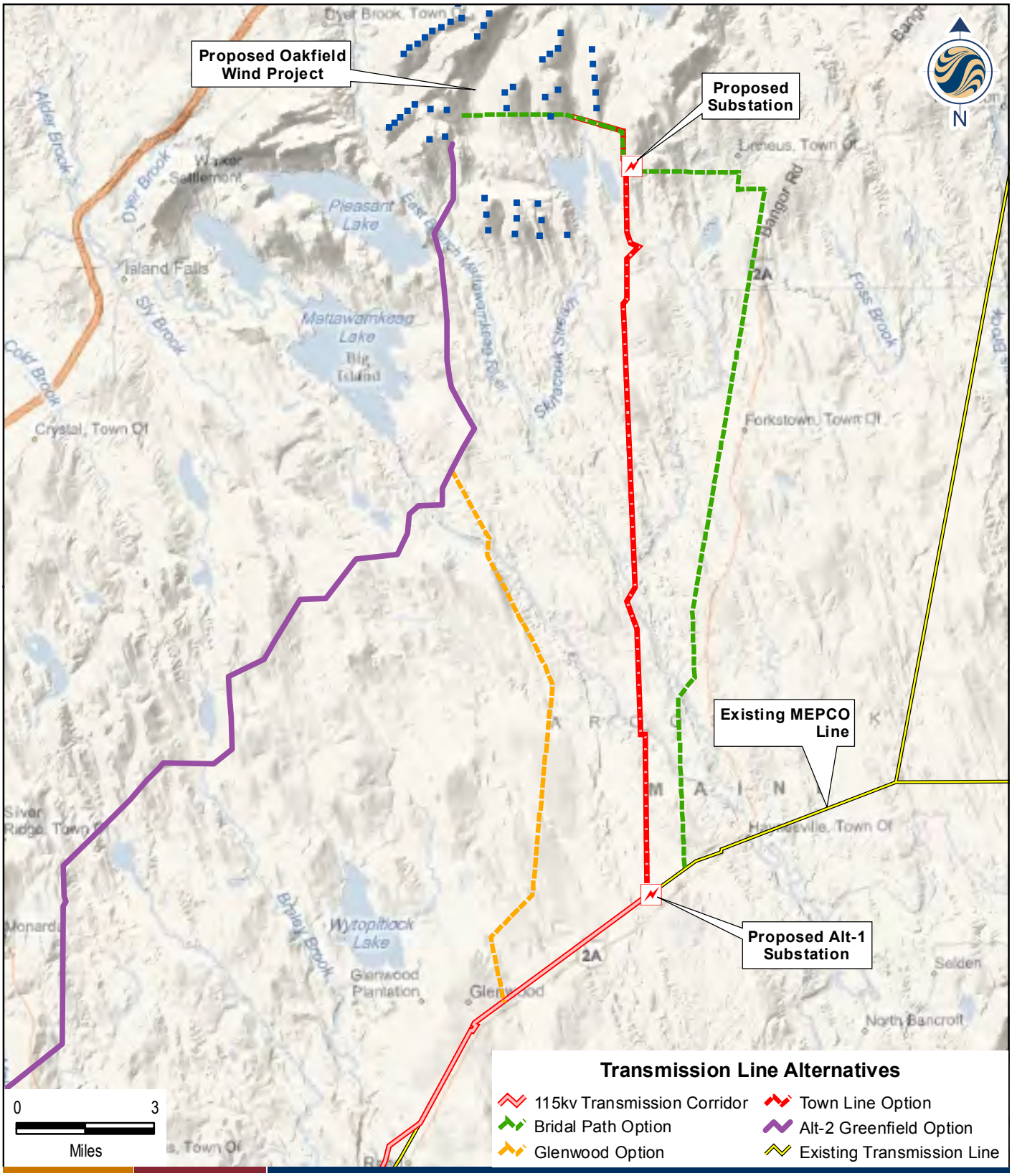
1. Existing transmission line was digitized by Stantec using the NAIP 2009 aerial image for Aroostook County.

Client/Project

Maine GenLead 115kv Transmission Line
Oakfield, Maine

Figure No.
2

Title
Transmission Line Route Alternatives
Line 56/MEPCO Alternatives
May, 2011



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Note:

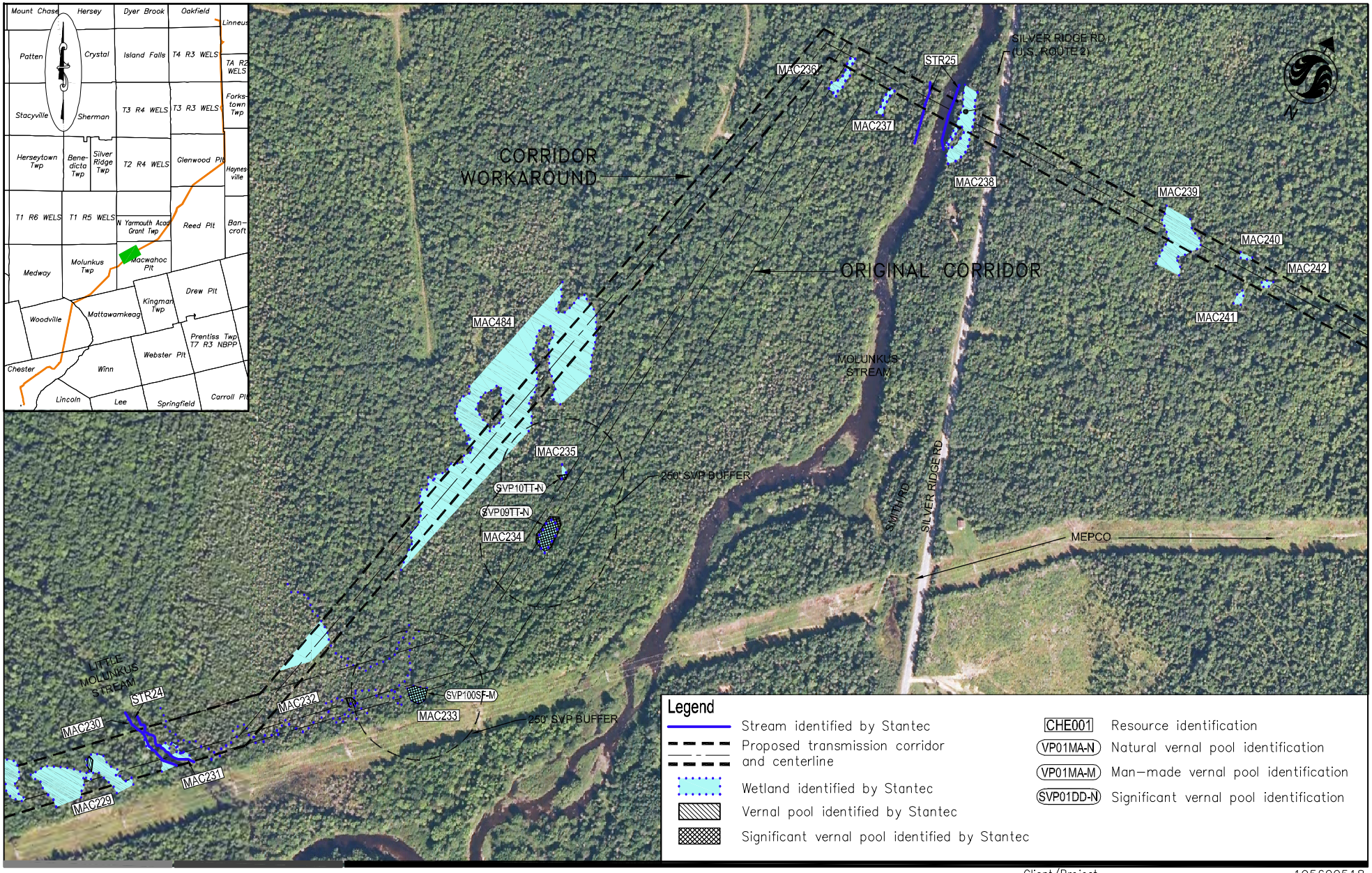
1. Existing transmission line was digitized by Stantec using the NAIP 2009 aerial image for Aroostook County.

Client/Project

Maine GenLead 115kv Transmission Line
Oakfield, Maine

Figure No.
3

Title
Transmission Line Route Alternatives
MEPCO Connection Alternatives
May, 2011



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00518-WorkArounds.dwg

Notes

1. 2009 NAIP aerial photo obtained from MEGIS.

0 1000'

1"=1000'

Client/Project 195600518
Maine GenLead, LLC
Maine GenLead 115kV Transmission Line
Oakfield, Maine

Figure No.
4

Title
SVP Corridor WorkAround
Delineated Natural Resource Map

May, 2011

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00518–WorkArounds.dwg

Notes

1. 2009 NAIP aerial photo obtained from MEGIS.

0 600'

1"=600'

Client/Project 195600518

Maine GenLead, LLC

Maine GenLead 115kV Transmission Line

Oakfield, Maine

Figure No.

5

Title

E. Branch Mattawamkeag Crossing Workaround

Delineated Natural Resource Map

May, 2011

Appendix 1A-1
Major Alternatives Matrix

Transmission Line - Connection Alternatives					
		ALTERNATIVE 1	**ALTERNATIVE 2**	**ALTERNATIVE 3**	**ALTERNATIVE 4**
Rating Criteria		Oakfield Wind Project to Haynesville, direct connection to MEPCO	Oakfield Wind Project to Keene Road Substation via new ROW	Oakfield Wind Project to Keene Road Substation via co-location with MEPCO (Preferred)	No Build
Length	**Total Length of Transmission Line (Miles)**	17.5	60	59	N/A
	Length Parallel to Existing ROW (Miles)	0	0	41	N/A
Grid Connection	**Direct Delivery of Power to ISO New England**	Yes	Yes	Yes	No
Landowner Impacts	**Impact to Landowners**	Low	Moderate	Low	N/A
	Number of Parcels Crossed	25	55	95	N/A
	Ability to Acquire Necessary Land	Moderate	Low	Moderate	N/A
Environmental Impacts	**Aesthetic Impacts**	Low	Moderate - visible at road crossings and Penobscot Crossing	Low - Moderate - visible at road crossings and Penobscot Crossing but co-located so impact is reduced	None
	Tree Clearing Required	Moderate	High	High	N/A
	Wetland Impact	Low	Moderate	Moderate	N/A
	Habitat Fragmentation	Low	High	Low	N/A
	Accessibility	Low	Low	Moderate	N/A
Cost	**Costs of Construction and Operation**	High	Moderate	Moderate	N/A

Appendix 1A-2
Section A Route Alternatives Matrix

Route Alternatives from MEPCO to Oakfield Wind Project			
Rating Criteria		OPTION A-1	OPTION A-2
		Collocate with MEPCO	Collocate with Line 56
Length	Length of Transmission Line (in Miles)	5.5	6.5
	Length Parallel to Existing Corridor (in Miles)	5.5	6.5
Landowner Impacts	Impact to Landowners	Moderate	Low
	Ability to Acquire Necessary Land	Moderate	High
Environmental	Aesthetic Impacts	Low	Low
	Tree Clearing Required	High	Low
	Wetland Impact	Moderate	Moderate
	Habitat Fragmentation	Low	Low
	Accessibility	High	High
Cost	Costs of Construction and Operation	Moderate	Moderate

Appendix 1A-3
Section C Route Alternatives Matrix

Route Alternatives from MEPCO to Oakfield Wind Project				
Rating Criteria		**OPTION C-1**	**OPTION C-2**	**OPTION C-2**
		Oakfield to MEPCO in Glenwood via T4R3/T3R3 (Glenwood Option)	Oakfield to MEPCO in Glenwood along town lines (Town Line Option)	Oakfield to MEPCO in Haynesville via Bridal Path (Bridal Path Option)
Length	**Length of Transmission Line (in Miles)**	21	17.5	20
	Length Parallel to Existing Corridor (in Miles)	0	0	0
Landowner Impacts	**Impact to Landowners**	Low	Low	Moderate
	Ability to Acquire Necessary Land	Moderate	Moderate	Low
Environmental	**Aesthetic Impacts**	Low	Low	Low
	Tree Clearing Required	High	High	Moderate
	Wetland Impact	Moderate	Moderate	Moderate
	Habitat Fragmentation	Moderate	Moderate	Low
	Accessibility	Low	Low	Moderate
Cost	**Costs of Construction and Operation**	Moderate	Moderate	Moderate