

VISUAL IMPACT ASSESSMENT

For the Proposed Bingham Wind Project

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Prepared for:

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Exhibits

Attached

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1. EXECUTIVE SUMMARY

1.1 Overview

Blue Sky West, LLC and Blue Sky West II, LLC are proposing the Bingham Wind Project (Project), a utility-scale wind energy facility in Somerset County and Piscataquis County, Maine. The Project includes up to 62 wind turbines, associated access roads, a 34.5-kilovolt (kV) electrical collector system, an electrical collection substation, a gen-lead transmission line, a Dynamic Reactive Device, an Operations and Maintenance (O&M) building, and up to five permanent 90-meter meteorological (met) towers.

The Project will be constructed on a series of ridges, hills and plateaus in Moscow, Bingham, Parkman, Abbot, Mayfield Township and Kingsbury Plantation. Access roads will connect each turbine location and will provide construction and maintenance access from Route 16. The electrical collector system will connect each turbine location, collect at an onsite substation, and then a gen-lead line will travel southeast for approximately 17 miles towards an existing CMP substation located in Parkman.

There are no resources of state or national significance (as defined in Maine’s Wind Energy Act) located within 3-miles of the generating facilities. There are eleven resources of state or national significance located within the three to eight-mile viewshed¹, although the following seven of those resources **do not have visibility** of the Project:

- One lake of scenic significance located in Concord Township – Jackson Pond;
- Three sites listed on the National Register of Historic Places - Concord Haven and Caratunk Falls Archaeological District located in Embden; Bingham Free Meetinghouse located in Bingham;
- The Main, East and West Branch of the Piscataquis River, which flow through Abbott, Blanchard Township, and Monson.
- One Maine Department of Transportation scenic turnout located in Solon on Route 201, the Old Canada Road Scenic Byway; and,
- The Appalachian National Scenic Trail, which traverses the northern edge of the study area through Bald Mountain Township and Blanchard Township.

¹ A viewshed is generally defined as the geographic areas from which a project can be seen or has the potential to be seen. For the purposes of this project and the regulatory review requirements, the viewshed is all areas within an 8-mile radius of any of the project’s turbine locations. This area is also referred to in this report as the “study area.” See also Section 2.3.1 of this VIA.

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The four resources of state or national significance within 3-8 miles that **will have potential visibility**² of the Project based on viewshed analysis include the following:

1. *Arnold Trail to Quebec* – see description of the Kennebec River described in 3 below for visibility from the river. From the 2 identified sites from Arnold’s march (“take-out” and “put-in”) as well as Arnold’s Way Rest Area that hosts interpretive panels, there will be no Project visibility within the 8-mile study area.
2. *Bald Mountain Pond* – Up to 3 turbines may be visible within 8 miles as background views. The closest visible turbine is approximately 6.8 miles away.
3. *Kennebec River (including Wyman Lake)* – Up to 10 turbines may be visible within 8 miles from the river downstream from Wyman Dam as middleground views. The closest visible turbine is approximately 3.9 miles away. From Wyman Lake up to 12 turbines may be visible within 8 miles as background views. The closest visible turbine from Wyman Lake is approximately 5.6 miles away.
4. *Punch Bowl Pond*² - Up to 8 turbines may be visible within 8 miles primarily as middleground views. The closest visible turbine is approximately 4.2 miles away.

A review of associated facilities was also conducted as part of this assessment pursuant to the visual standard set forth in Maine’s Wind Energy Act. Throughout most of the study area, topography, forest cover, and roadside vegetation constrain or block views of the Project’s associated facilities, limiting visibility. There are no significant views of the associated facilities from any resources of state or national significance within 8-miles.

1.2 Conclusion

The VIA was prepared in accordance with the scenic impact assessment requirements of the Wind Energy Act (found at 35-A M.R.S.A. § 3452, et seq.). As a result of our work, we have concluded that **the proposed Project conforms with the provisions of the Act, is well sited and designed and would not have an unreasonable adverse effect on the scenic character or existing uses related to the scenic character of any scenic resource of state or national significance.**

There no resources of state or national significance within 3-miles. There are seven resources of state or national significance within 3-8 miles that will have no visibility of the Project. There are 4 other resources of state or national scenic significance within 3-8 miles that will have potential visibility of the Project.

² Potential visibility is based on viewshed analysis within 8-miles from each hub and accounting for topography and 12 meter vegetation (approximately 40 feet) using land classes deciduous, coniferous and mixed forest cover only. Punchbowl Pond visibility is based on a modified viewshed, which accounts for shoreline vegetation.

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Although the Project area has landscape qualities and recreational resources that are appealing to those who live in and travel to the area, these resources do not have characteristics that are unique only to this region, or possess highly sensitive visual qualities that preclude the addition of an array of wind turbines within their viewshed. The Route 201 corridor through this stretch is densely developed and alteration in the landscape is widespread. Moreover, the low rolling hills and nondescript vegetation found here does not include distinctive geomorphological characteristics. There is widespread agreement among aesthetic experts that landscapes that are very scenic or outstanding and very sensitive to change usually have intact, prominent distinctions between landforms, such as open water in combination with a steeply rising mountain, or have unique focal points and distinct, memorable characteristics that cannot be found elsewhere. Those types of features are not present here and, as a result, the landscape in the Project area is generally able to accommodate the presence of turbines without fundamentally changing the character of the area or adversely impacting recreational uses of the scenic resources.

Aesthetic experts also measure scenic quality by the intactness of the landscape. The Project area is not pristine, and has long been a working landscape that has been used and developed for its timber, hydroelectric and water resources. It is a hub of commercial forestry, and hundreds of surrounding acres are in active forest management. For more than 100 years, recreation and timber harvesting have existed in concert with one another here. These uses are not mutually exclusive pursuits, and the hunters, snowmobilers, hikers and other users of the study area use the network of land management roads constructed by timber companies.

Bingham is also the location of Wyman Dam, a large hydroelectric facility that hosts several electrical interconnects. This dam is one of nine located on the Kennebec River between Augusta and Moosehead Lake, where 62 miles (53 %) of the river is now inundated.³ Wyman Dam is currently being upgraded to 88 MW, which will make it the largest in the state of Maine, surpassing the Harris Station Dam upstream.

Based on this history of use, and the alterations already present, the perception of an untouched, unalterable environment is not present here. Furthermore, the Legislature has identified areas suitable for expedited permitting of grid-scale wind energy development to help reduce disagreement over siting. The Bingham Wind Project has been sited in an expedited area that has been determined from a landscape level to be compatible with the existing land use patterns.

Research indicates that the Project area, while located within the Kennebec & Moose River Valleys tourism region, is not the primary hub of visitor and tourism activity. The more frequented locations, such as Madison, Waterville and The Forks, are located well outside the 8-mile study area. Moreover, intercept surveys as well as personal observation and other research,

³ <http://www.maine-flyfishing.com/ourriver.htm>

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confirm the overall low use of the Project resources. The principal activities that occur here include but are not limited to fishing, paddling, and snowmobiling/ATV riding.

In addition, there is a growing body of evidence that the presence of wind turbines in the viewshed of the types of uses and resources present here will not unreasonably adversely impact either scenic quality or, importantly, the continued use and enjoyment of those resources. This evidence includes intercept surveys conducted in the study area and elsewhere in Maine.

Finally, in relation to the size of the Project, there is remarkably limited to no visibility from resources of scenic significance. The Project fits within the topography of the region and vegetation around the scenic resources reduces potential visibility. Furthermore, visibility from most resources is primarily of the hubs or tips of blades, which are harder to see at increasing distances, and viewing locations are limited. Moreover, no turbine is within 3-miles of a scenic resource and the average viewing distance will be greater than 6 miles.

2. INTRODUCTION

2.1 Background

LandWorks has developed a Visual Impact Assessment (VIA) of the Proposed Bingham Wind Project (Project) on behalf of Blue Sky West, LLC and Blue Sky West II, LLC a subsidiary of First Wind Holdings, LLC the Project developer. This assessment is designed to be in conformance with and in response to the applicable guidelines and regulations promulgated by the State of Maine, and specifically follows the requirements set forth in 35-A M.R.S.A. § 3452. This report begins with an overview of the applicable regulations and the methodology employed by LandWorks in preparing the assessment. It includes a project description, presentation of existing conditions, an inventory of scenic resources of state or national significance, and an analysis and conclusion on the overall scenic impact on any potentially affected scenic resource taking into account each of the review criteria set forth under 35-A M.R.S.A. § 3452.3.

2.2 Regulatory Purview

The Legislature has identified areas designated for expedited permitting of grid-scale wind energy development. As stated in the Wind Energy Act:

...it is in the public interest to reduce the potential for controversy regarding siting of grid-scale wind energy development by expediting development in places where it is most compatible with existing patterns of development and resource values when considered broadly at the landscape level. Accordingly, the Legislature finds that certain aspects of the State's regulatory process for determining the environmental acceptability of wind energy developments should be modified to encourage the siting of wind energy developments in these areas. 35-A M.R.S.A. §3402(2).

The Bingham Wind Project has been sited in an expedited area that has been determined from a landscape level to be compatible with the existing land use patterns and is therefore subject to review under the Legislature's enacted standards specific to wind power. The applicable criteria were enacted in 2008 as part of "An Act To Implement Recommendations of The Governor's Task Force on Wind Power Development" (the Act). In making its determination whether a project has an "unreasonable adverse effect on the scenic character and existing uses related to scenic character of a scenic resource of state or national significance," the Maine Department of Environmental Protection (DEP) must consider the following six criteria outlined in 35-A MRSA §3452.3:

- A. The significance of the potentially affected scenic resource of state or national significance;
- B. The existing character of the surrounding area;

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- C. The expectations of the typical viewer;
- D. The project purpose and the context of the proposed activity;
- E. The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance; and
- F. The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape.

Because the impact of visibility diminishes with distance, a formal assessment of project visibility on scenic resources located more than 3 miles away is not automatically required. Nonetheless, this VIA extends to the full eight miles to ensure that visibility on all scenic resources of state or national significance within eight miles is fully assessed. In addition, this assessment evaluates visibility of the Project's associated facilities (i.e. access roads, collector lines, O&M building, etc.).

2.3 Methodology

Our assessment identifies scenic resources of state or national significance within an eight-mile study area as defined under 35-A MRSA §3451.9, and evaluates the visual impact of the Project on scenic character and existing uses related to scenic character of those designated resources. The methodology to determine potential effect includes visual and cartographic analyses, document and statutory research, and site inventory and photographic review. Our approach reflects an evolving methodology and effort to develop objective standards and metrics, and provides a comprehensive and analytical means by which to consider and assess the potential visual and aesthetic impacts that may result from a wind power project and its associated elements.

2.3.1 Viewshed Analysis

A viewshed analysis has been conducted using ArcMap GIS software to identify areas with potential visibility. It is based on the elevation values of the National Elevation Dataset (NED), the primary elevation data product of the USGS, at a resolution of 1/3 arc-second (about 10 meters). Four viewsheds were completed, which include:

1. Exhibit 1: Viewshed Map [topography only/from the tip] – this map identifies potential visibility from the blade tip (150 m) and does not account for the screening effects of vegetation, buildings and other structures that may block views.

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2. Exhibit 2: Viewshed Map [topography only/from the hub] – this map identifies potential visibility from the turbine hub (94 m) and does not account for the screening effects of vegetation, buildings and other structures that may block views;
3. Exhibit 3: Viewshed Map [topography and vegetation/from the tip] – this map identifies potential visibility from the turbine tip (150 m) and accounts for the screening effects of three types of vegetation. Adding a standardized height of 40 feet to the three classes identified as forest (Classes 9, 10, and 11 of the MELCD 2004 land cover database⁴) provides a more realistic yet still conservative representation of potential visibility; and,
4. Exhibit 4: Viewshed Map [topography and vegetation/from the hub] – this map identifies potential visibility from the turbine hub (94 m) and accounts for the screening effects of three types of vegetation. **This map represents the most reasonable approach to potential visibility, since turbine blades that rise above treeline are not typically visible or dominant.**

The viewshed maps prepared for this Project do not account for other factors such as buildings and structures, actual tree height and density, site specific vegetation and/or removal, variations in eyesight, and atmospheric and weather conditions. In particular, 40-foot tree height is conservative for much of this area and can have a significant impact on potential visibility. Tree heights in this region are more characteristically 65 feet or higher, as was confirmed in site visits conducted on June 26 2012, and observed November 5, 2012. Limiting vegetation to only the three forest classes is also conservative because other areas may have vegetation that screens views (e.g. forested wetlands). This is particularly noticeable at Punchbowl Pond, where shoreline vegetation along the southern and western shores are not accounted for in the analysis due to their designation as “24 - light partial cut.” Field investigation, however, confirms there is an untouched vegetative buffer around the lake with tree heights of approximately 65 feet.⁵ Therefore, in the case of Punchbowl Pond, the viewshed analyses greatly overstate potential visibility. A more realistic viewshed is presented in Section 4.3.1.F.

It is our experience that viewsheds generated from the hub provide a more realistic representation of potential visibility, since the view of a hub and rotor has a greater impact than turbine blades, and the difference in overall percent of visibility between hub and tip of the blade is usually

⁴ **9 Deciduous Forest** - areas dominated by trees generally greater than 5 meters tall and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change. Characteristic species: Maples (*Acer*), Hickory (*Carya*), Oaks (*Quercus*), and Aspen (*Populus tremuloides*).

10 Evergreen Forest - areas dominated by trees generally greater than 5 meters tall and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage. Characteristic species: Longleaf pine (*Pinus palustris*), slash pine (*Pinus elliotti*), shortleaf pine (*Pinus echinata*), loblolly pine (*Pinus taeda*), and other southern yellow (*Picea*); various spruces and balsam fir (*Abies balsamea*); white pine (*Pinus strobus*), red pine (*Pinus resinosa*), and jack pine (*Pinus banksiana*); hemlock (*Tsuga canadensis*); and such western species as Douglas-fir (*Pseudotsuga menziesii*), redwood (*Sequoia sempervirens*), ponderosa pine (*Pinus monticola*), Sitka spruce (*Picea sitchensis*), Engelmann spruce (*Picea engelmanni*), western red cedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*).

11 Mixed Forest - areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.

⁵ Confirmed using the Abney Level

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insignificant. As such, the numbers of turbines visible and percent of visibility represented in this analysis are taken from viewsheds generated from the hub.

The viewshed maps also include visibility of any turbine, including those located greater than eight miles, as a conservative measure and to ensure that readers are not misled. Although the presence of turbines located more than eight miles is deemed insignificant under Maine law, this approach is consistent with more typical viewshed analyses, which identify the visibility of all turbines from within an 8-mile radius, or area of potential effect, regardless of individual distance. Consistent with the comments by the Department's outside visual reviewer, the resource specific discussions provide the viewshed analysis based on visibility only of those turbines located within eight miles.

Viewshed analyses are used mainly as a point of departure for identifying areas with potential visibility. Due to the coarseness and uncertainty of the quality of the raster data, viewsheds cannot be relied upon to represent what will actually be seen on the ground from a specific location. While a viewshed can indicate how many observer points can be seen from each location (i.e. 3 of 16 turbines will be visible), it can not specify how much (just the tip of a blade or the entire turbine), which one (when there are multiple observation points), or perspective (how big or small it will appear in the landscape). Therefore, a viewshed analysis provides the first step in identifying what areas might have visibility. Additional visual studies (e.g. visual simulations, line-of-sight sections, 3-D modeling) are necessary to understand the details of a view from a specific location.

2.3.2 Field Investigations

Using the viewshed mapping as a point of departure, LandWorks conducted field studies on February 23, 2010, June 7 and 8 of 2010, and November 5 and 6 of 2012. We visited all scenic resources of state or national significance that would have potential views of the Project. Bald Mountain Pond was accessed by a guided snowmobile, while the river and other lakes were accessed by foot. All other sites were accessed by vehicle. Additionally, the roads within the study area, including but not limited to sections of Route 16, Route 201, Route 6, Route 15, Pond and Barrow Falls Road and the adjoining camp roads around Piper Pond and Whetstone Pond, Diamond Pond Road and the area around Foss Pond, plus an extensive logging road network that originates at Route 16 in the Kingsbury Pond area that all provide access to the Project site, were evaluated to obtain a better understanding of the character of the area. LandWorks used viewshed maps, topographic maps, field guides, books, brochures, pamphlets, websites, local information sources and the Maine Atlas & Gazetteer to provide additional information regarding the use of the areas visited, access to the sites, and to orient and determine visibility in the field. Field notes were recorded from all locations visited.

Throughout the inventories, two types of digital photographs were taken: 1) to provide information on area context and to illustrate scenic views or intervening vegetation or structures,

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and, 2) for the purpose of developing visual simulations. For general photographs of the project area, LandWorks used a Canon PowerShot SD850 IS set at varying focal lengths to capture the intended image. For visual simulations, LandWorks used a Canon EOS Digital Rebel XT with a 56 mm (35 equivalent) lens for the photography and the Earthmate PN-40 GPS to collect waypoint data.

2.3.3 Visual Simulations

Simulations were developed using the following methodology:

Step 1: Data Gathering

A. Site Visit

Site information for simulation viewpoint is recorded, including view location (GPS point), date, time and weather.

B. Site Photography

Site photographs are taken for use in simulation. Camera type, focal length (approx. 50-55mm), camera elevation, direction of view, and horizontal angle of view are noted.

Step 2: Model Creation

A. Base map & Terrain Model

A digital base map is created of the project and view areas. GIS data acquired from www.megis.maine.gov/catalog and the client; Aerial photographs and USGS maps used as needed. Utilizing the base map and GIS data, a 3D digital terrain model is created. Where forested, the terrain model is adjusted to account for the additional height contributed by trees (40').

B. Turbine Model

Using data and drawings obtained from the turbine manufacturer, a 3D digital model is created of the turbine. This model is then merged with the terrain model, placing the turbines at their appropriate proposed locations and elevations.

C. View Setting

The existing conditions photograph is imported into the terrain model. The data gathered from the site visit is then inputted into the modeling program (VectorWorks 2008), and a "camera view" matching the original site conditions is created. A digital image of this view is exported for use in the next step.

Step 3: Simulation Rendering

A. Conditions Overlay

Using a photo editing and rendering program (Photoshop CS5), the exported digital image of the perspective view is precisely overlaid and registered to the original existing conditions photograph. Simulations are typically composed of panorama photos (50% overlap on either side of center frame) in order to represent the way views are actually perceived given the normal range of eye and head motion.

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B. Turbine Placement

High resolution images of the turbine model (from SketchUp Pro 7) are placed at proper locations, scale and perspective to match the exported view image.

C. Final Rendering

Turbines are adjusted to mimic quality of light, distance and detail in site photograph. Vegetation and other visual obstructions are accounted for. Visual impacts from associated facilities (including access roads, collector lines and associated clearing) are rendered and reflected in all the visual simulations (using a perspective view created in 3D Analyst that models required project clearing).

Visual simulations provide a photo-realistic perspective view of proposed project elements in the landscape, thereby allowing people to clearly visualize how a project will look from a particular vantage point. Visual simulations are useful in terms of revealing the nature and extent of potential visibility of a project from key vantage points, providing more accurate and refined information than a viewshed analysis can provide. They often reveal how topography and vegetation can limit or block project views, sometimes in surprising ways. Visual simulations from each of the scenic resources with potential visibility were prepared for this Project.

The simulations typically represent a point within an area identified by the viewshed analysis that has the highest range of turbines potentially visible that are within 8 miles. All of the simulation locations for this Project were selected based on this rationale. However, sometimes the chosen location turns out to have less visibility than determined by the viewshed analysis, as revealed by the visual simulation, due to differences in land cover data and the height of trees. For example, in the case of the Wyman Lake and Punchbowl Pond visual simulations, there is less visibility from the simulation locations than the viewshed map indicates due to the fact that the shoreline vegetation is not accounted for in the analysis (i.e. it is not one of the three land cover types used in the viewshed analysis). For Wyman Lake, one would have to paddle or boat out onto the lake to get to an area where 12 turbines might be visible. It should be noted, however, that the location that was selected for the Wyman Lake visual simulation was anticipated to receive a higher concentration of use due to its location adjacent to a picnic area and boat launch. It is also important to note that while these locations are chosen for the greatest number of turbines potentially visible, they are not always places that receive the greatest amount of use. For example, the Bald Mountain Pond simulation was taken in the northeast corner of the Pond in an area only accessible by a canoe or kayak. The Kennebec River simulation was taken from a location that few users are likely to visit. No simulation is provided for the Arnold Trail since the route followed the Kennebec River and the other two assumed locations (“take-out” and “put-in” for portage over Caratunk Falls) do not have visibility.

The weather and atmospheric conditions presented in the visual simulations depict a range of conditions experienced during our site visits. Due to the highly variable and changing weather of the northeast, not all photos depict sunny, blue-sky conditions. However, the visual simulations

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depict a range of weather and light conditions that are typical of the area. In addition, rotors are typically depicted from a broad view in simulations, whereas their visual presence could be less in reality, depending on wind direction and orientation. See Exhibit 5: Visual Simulation and Post-Construction Photos.

In order to mimic the perceived scale of the views in the field, the recommended viewing distance for the simulations is approximately 19". The simulations represent the central angle of view, which occurs within 40-60 degrees, and is the area that most highly influences human perception of a scene given a fixed viewing direction.⁶

2.3.4 Research and Publications

Information used to develop this report was derived from over 100 sources, such as studies, guidebooks, publications, online media, anecdotal and interview sources, as well as general field observations and professional expertise. Collectively, the different data sources provide a comprehensive understanding of the scenic resources to be evaluated, and the potential effect the Project may have on users of those resources. The information assembled from this multitude of resources yielded similar results that we believe directly inform and further substantiate our understanding of the scenic resources in the study area, and the Project's impact on those resources. The comprehensive list is provided in Exhibit 6. References.

⁶ The viewing distance was calculated using the method described in "Visual Simulation: A User's Guide for Architects, Engineers and Planners," by Stephen R. J. Sheppard. Based on a single image (7.8" high x 11.52" wide) formatted on an 11x17 sheet. With a horizontal angle of view of approximately 35 degrees for a single image, three images were typically merged in order to widen the field of view to be approximately 45 degrees. These calculations apply to every simulation that utilize photos taken by LandWorks. The simulations for Wyman Lake and Bald Mountain Pond utilize photos taken by others, after instructions provided by LandWorks, but they have been adjusted in their presentation to be consistent with the others in terms of viewing distance.

3. Project Description

3. Project Description

3.1 Wind Turbines

The Bingham Wind Project includes 62 turbines (63 potential turbine locations are being permitted), capable of generating up to 191 megawatts (MW) of electricity. Eleven of the turbines will be located in Bingham, twenty-nine in Mayfield Township, and twenty-two in Kingsbury Plantation. The project will be constructed on ridges, plateaus and hills in the vicinity of Route 16, including Johnson Mountain and unnamed hills north and northeast of Johnson Mountain, and an unnamed ridge north of Route 16. The turbine rotors and towers will be a light or white color, which is the best choice for enabling the structures to blend into background sky and atmospheric conditions. Following construction, the grading and disturbed areas around each turbine pad and approximately 1/3 of the crane path width will be allowed to revegetate.

Two turbine models are being evaluated for the civil and electrical design described in the permit application: Siemens turbines, assuming up to 62 SWT-3.0-113 turbines, with a maximum height of 149 meters (489 feet); and Vestas turbines, assuming up to 62 V112-3.0 turbines, with a maximum height of 150 meters (492 feet). For purposes of this Visual Impact Assessment, the tallest turbine model (Vestas) was evaluated.

3.2 Access roads

Existing roads will provide construction and maintenance access from Route 16 to the Project, with the exception of one new access road off Route 16 that will be constructed; new and existing access roads and crane paths will connect turbine locations. Many of the proposed turbine sites and portions of the Project area have been or are being used for commercial forestry operations and the Project area contains logging roads that will be upgraded and used, where appropriate, to minimize new construction, clearing and wetland impacts. Roads are sited to work with the existing topography and therefore minimize cut and fill, and in most instances, existing mature trees will screen views of the roads. Road construction will include improvements to 5.3 miles of existing 24-foot access roads, as well as building 17 miles of crane path, all of which will be maintained by the Applicants. Between turbines, portions of the access roads will be 38 feet in width to accommodate the crane during construction. Access roads and clearing are accounted for in the visual simulations. Additional visibility analysis of associated facilities is provided in Section 5.0.

3.3 Electrical Collection System / Substation

A 34.5-kV electrical collector line system will collect power from each turbine and connect via collector lines to a proposed project substation located in Mayfield. The substation will “step up” the power to 115 kV, and transmit the power on the generator lead line for approximately 17

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miles to Central Maine Power Company's Guilford substation in Parkman, where it will tie into the existing Central Maine Power Company electric system.

The collector system will run mainly underground along project roads, with the exception of an approximately 4-mile long above-ground segment that will parallel the north side of Route 16 before heading north into the project area. In addition, other shorter sections of above-ground collector segments are proposed. Clearing for the collector line system and visibility, if any, of the above ground portions of the collector system is accounted for in the visual simulations. Additional visibility analysis of associated facilities is provided in Section 5.0 (see Exhibit 7: Generator Lead and Electrical Collector Potential Visibility and Exhibit 8: Substation and DRD Potential Viewshed Map).

3.4 Operations and Maintenance Facility

An O&M building of up to 5,880 square feet (70' x 84') is planned for a location north of Route 16 in Bingham near the center of the project in a previously cleared area. This single-story building will be painted a neutral color to blend with its surroundings. Additional visibility analysis of associated facilities is provided in Section 5.0 (see Exhibit 9: O&M Potential Viewshed Map).

3.5 Meteorological Towers

The project will include up to five permanent meteorological towers with a maximum height of 104 meters, although all five may not be built. The design depicts five locations for permanent met towers and includes the clearing impacts associated with all five locations. In addition, up to five temporary met towers with a maximum height of 104 meters may be placed at turbine pad locations before the turbines are erected. These temporary towers will be removed prior to the completion of construction. Due to the narrow profile and light color of meteorological towers, their visibility is relatively minimal. Additional visibility analysis of associated facilities is provided in Section 5.0 (see Exhibit 10: Meteorological Tower Viewshed Map).

3.6 Project Lighting

The wind turbines and permanent met tower will be illuminated in accordance with FAA requirements for turbine lighting in order to address aviation safety. Based on the Lighting Plan (see Applicant's Exhibit 30D), the met tower and approximately 50% of the turbines will be lit at night. As shown on Exhibit 11: Turbine Night Lighting Viewshed Map, turbines 1, 4, 6, 7alt, 9, 11, 12, 15, 16, 18, 20, 21, 24, 25, 27, 29, 32, 35, 38, 41, 42, 44, 45, 47, 49, 51, 53, 55, 58, 73, 75, and 77 will have red aviation warning lights that will be lit at night. The plan calls for red lights on the met tower and turbines that will flash simultaneously with a rapid discharge strobe (slow-on, slow-off profile), which will remain on at night to warn aircraft of the existence of the

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structures. According to the governing FAA standard⁷, lights typically used in these types of applications are omni-directional, L-864 Red Flashing Lights (incandescent or rapid discharge [strobe]) with a minimum 750 candela with a 3-degree vertical beam spread. An evaluation of where lit turbines will be visible from scenic resources of state or national significance has been conducted and described in Section 4.4 of this report. See also Exhibit 12, which includes annotated visual simulations with an arrow identifying which turbines will be lit.

Although the impact of the required nighttime lighting is minimized through use of a limited vertical beam spread and other mitigating factors, the Project has proposed the use of a radar-assisted lighting system to reduce the effects of nighttime lighting. Although not yet approved by the FAA for use on wind turbines in the United States, the new nighttime lighting mitigation systems utilize radar mounted on the turbines or in close proximity to the turbines to detect aircraft when they are approaching the structure at night and automatically turn on the FAA lights. The lights then automatically turn off once the aircraft has left the airspace in proximity to the wind farm. These systems permit wind turbine obstruction lights to remain off at all times unless an aircraft is operating in the vicinity of the wind farm, thus greatly reducing nighttime lighting at these wind projects. The Project proposes to install the technology as soon as it obtains the necessary approvals from FAA and is able to contract with vendors for installation of the technology. The installation would either occur during construction or during operations based on when the FAA approves the technology and a commercially-viable product is available. This mitigation technology will essentially eliminate the impacts of nighttime lighting on potential recreational users of the Project area resources.

3.7 Project Area

The 8-mile study area contains fourteen municipalities and four unorganized territories. Within this area the elevation of the surrounding landscape ranges from roughly 350 feet along the Kennebec River below Wyman Dam, to over 2,900 feet on the slopes of Moxie Mountain. The proposed Project itself is located in the towns of Bingham, Moscow, Parkman, Abbot, Mayfield Township, and Kingsbury Plantation, crossing the border between Somerset and Piscataquis Counties. The array of turbines stretches northeast from Johnson Mountain in Bingham, along an unnamed ridgeline through Mayfield Township, to Kingsbury Plantation, and ranging in elevation from 1,400 to 1,800 feet.

In general, residential development in the Project area is very low density, with an average population density of 11.5 people per square mile, with the lowest densities in Bald Mountain Township T2 R3 (0.3), Mayfield Township (0.3) and Kingsbury Plantation (0.2), according to the 2010 Census. Solon and Bingham have the largest population concentrations in the vicinity, with densities of 26.6 and 26.4 people per square mile, respectively. Bingham is the hub of this area.

⁷ U.S. Department of Transportation Federal Aviation Administration. Obstruction Marking and Lighting Chapter 13, February 2007. (FAA AC 70/7460-1K)

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The town's website describes it as a "regional commercial and employment center for northern Somerset County" despite its population under 1,000. Most development within Bingham is concentrated in the downtown area along Route 201 and the Kennebec River, just south of Wyman Lake.

The primary roads in the area are Route 16, which runs east from Bingham through the Project Site; Route 151, which joins Route 16 near the Project; and Route 201, which runs north-south along the eastern side of Wyman Lake, west of the Project Site. Route 201 is part of the Old Canada Road Scenic Byway, which stretches from the Canadian border to 13 miles south of Bingham. The Maine Office of Tourism describes the Byway as following "the old river trading paths of the Abenaki tribe, leading visitors back in time through towns where turn-of-the-century homes line the main thoroughfare."

The Project itself is located in the Central Mountains biophysical region, but is bordered by the Western Foothills biophysical region towards the southeast. The Central Mountains biophysical region stretches northeast to Mount Katahdin, and is characterized by spruce-fir forests in the lower valleys and along ridges, with northern hardwood species in between. In the Western Foothills southeast of the Project, the elevation drops and boreal forest gives way to temperate forest.

Most of the land in the study area is privately owned and has been heavily harvested, showing evidence of extensive historic and recent forest management activity (see Diagram 2 that follows). There are several publicly and privately conserved parcels within the project area: In Caratunk, a 545-acre parcel southeast of Moxie Mountain is publicly conserved by the Maine Bureau of Parks and Land, described as the Original Reservation.

- North of Bald Mountain, there are 13 separate conserved parcels held by the Maine Bureau of Parks and Lands. Of these, two are designated as Public Land/SD Warren Co. and 11 are designated as Public Land/Original Reservation/Bald Mountain.
- The U.S. National Park Service holds approximately 1,250 acres of conserved lands within 8 miles of the Project, as part of the Appalachian Trail Corridor.
- The Small Woodland Owners Association of Maine owns three parcels near Foss and Whetstone Ponds, named Linkletter & Sons, Inc. / Kingsbury Plantation and totaling 1,049 acres.
- The Maine Department of Inland Fisheries and Wildlife holds a 16.5-acre parcel near Tibbetts Pond, designated as "Miscellaneous State Lands." According to Maine.gov, this designation may include "any type of public water access – swimming, boat launch, fishing," or land "used for outdoor recreation, including hiking, water activities, hunting, ATVs, or snowmobiles."
- The Maine Bureau of Parks and Lands holds an easement on five parcels along the Kennebec River, totaling 35 acres.

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The Kennebec River lies west of the Project, flowing toward the south along the western borders of Bingham. In 1930, a dam was constructed on the Kennebec just upstream of Bingham, which created Wyman Lake. Today, the dam is operated by FPL Energy with a generating capacity of 84 MW. The Federal Energy Regulatory Commission has recently granted FPL Energy a permit to upgrade its licensed capacity to 88 MW, which will make the Wyman Dam the largest in the state of Maine, surpassing the Harris Station Dam upstream on the same river.

In the summer months, the Kennebec River and Wyman Lake are most popular for fishing, including wading or casting from shore, fishing from a boat, or ice fishing on the lake in the winter. While the Kennebec River is well known for whitewater rafting on a 12-mile stretch from Harris Station Dam to The Forks, it is upstream of the Project area.⁸ There is an outfitter based in Bingham, which travels outside the study area for whitewater rafting trips, but they do offer “funyaks” and other paddling rentals for the stretch of the Kennebec just below Wyman Dam. However, this section of the river is most used for fishing as it is home to one of the few self-sustaining populations of rainbow trout, thanks to the cold water released from the dam year-round.⁹ Other lakes in the area are also popular for fishing, including Bald Mountain Pond, for trout, arctic char, and sunfish, among other species. There are many guide services in the area that offer fishing trips.

This region is also well known for its all-terrain vehicle and snowmobile trails. There are many trails in the vicinity, including connections to Maine’s Interconnected Trail System (see Diagram 1 that follows). Most snowmobile and ATV trails are maintained by clubs in the area, including the Moose Alley Riders, Lake Moxie ATV Riders, Abbott Explorers, and Abbott Big Pine Riders. *An Explorer’s Guide to Maine* describes the Upper Kennebec River Valley area as “a mecca for people who love to ride their all-terrain vehicles, with 400 miles of trails” and that “snowmobiling is huge in this region” (p. 658-660). Although visitors often bring their own ATVs and snowmobiles, many recreation outfitters in the area offer rentals and guided trips.

⁸ <http://raftmaine.com/the-rivers>, http://www.visitmaine.com/region/kennebec/the_forks/, and *An Explorer’s Guide to Maine 16th Ed.* by Christina Tree & Nancy English: describe the popularity of rafting, fishing, ATVing, and snowmobiling in the area

⁹ <http://www.maine-flyfishing.com/ourriver.htm>

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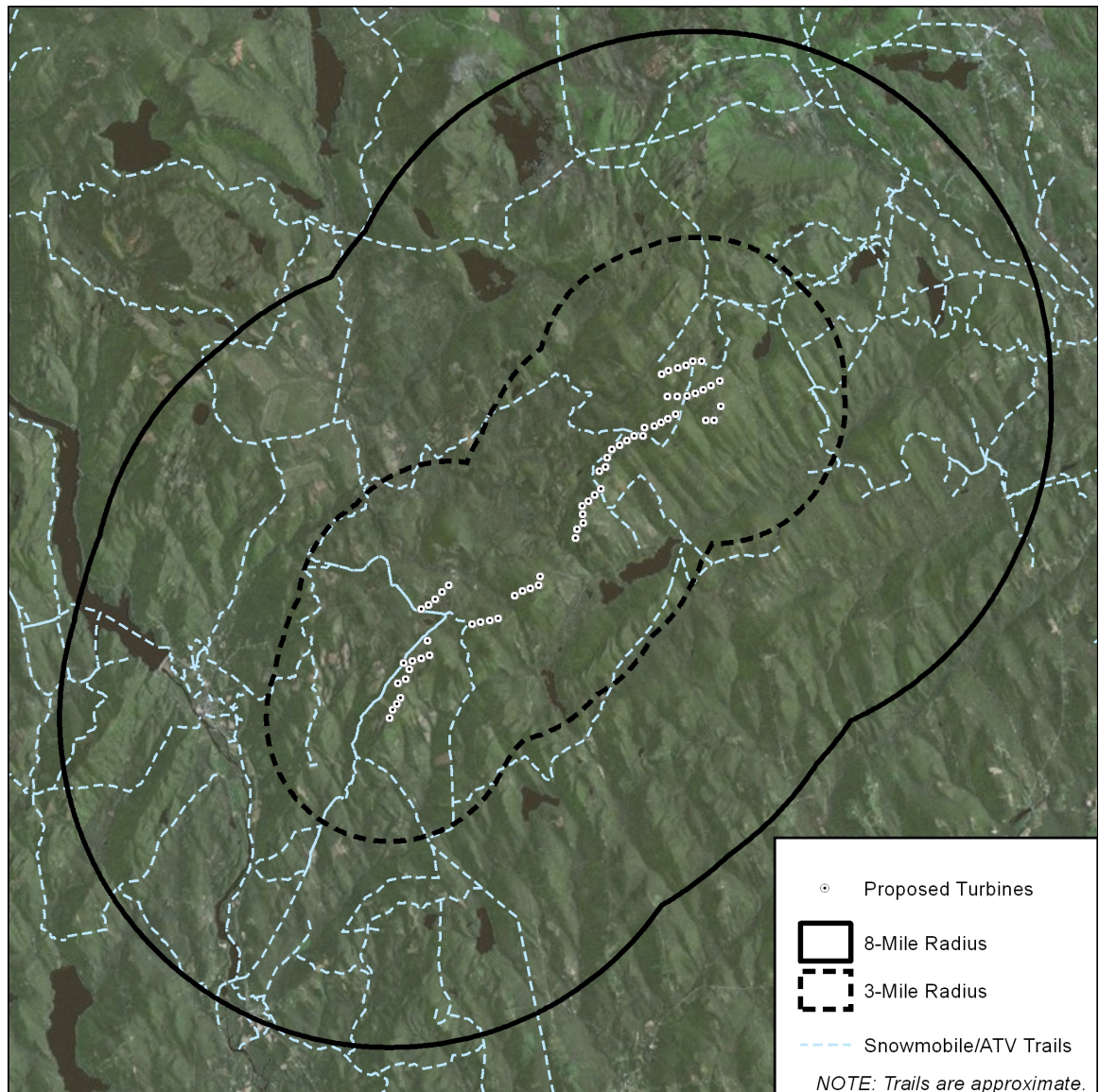


Diagram 1. Map of snowmobile/atv trails in the region

The Project area also offers some amenities for hikers. The Appalachian Trail travels east-west between six-eight miles north of the Project, past Bald Mountain Pond. There are three shelters located along the trail that are within the 8-mile study area. Many unnamed, primitive campsites are scattered elsewhere throughout the Project area, accessible by trails and unmaintained logging roads.

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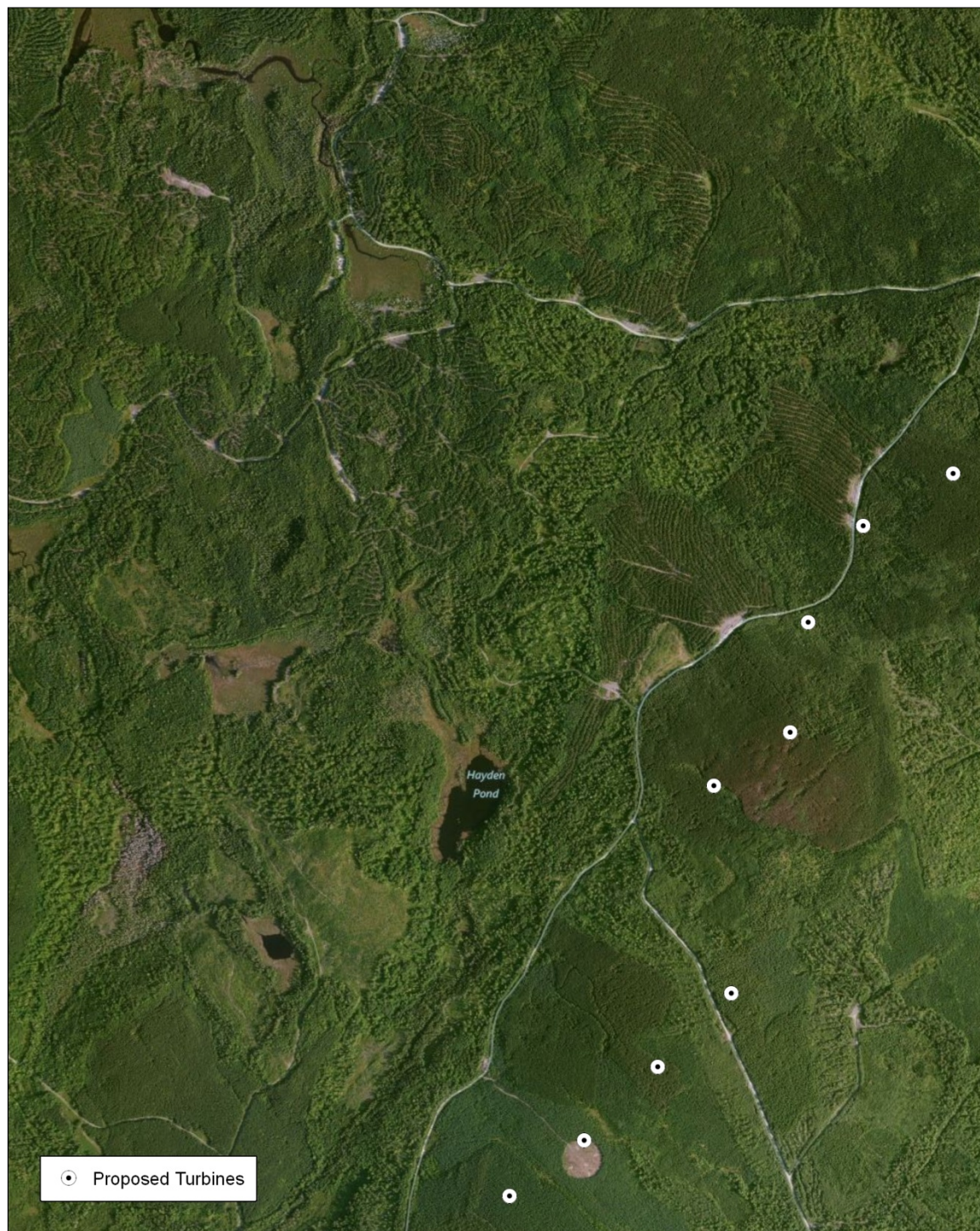


Diagram 2. This aerial photo illustrates the extensive logging and associated clearing and access roads seen throughout the region. Logging activities are clearly visible from Bald Mountain Pond and several other resources in the study area.

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4.1 Visual Impacts on Resources of State or National Significance

The Wind Energy Act limits consideration of visual and scenic impacts to visibility of the Project on a “scenic resource of state or national significance,” which is defined under the Act as

- an area or place owned by the public or to which the public has a legal right of access that is:
- A. A national natural landmark, federally designated wilderness area or other comparable outstanding natural and cultural feature, such as the Orono Bog or Meddybemps Heath;
 - B. A property listed on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended, including, but not limited to, the Rockland Breakwater Light and Fort Knox;
 - C. A national or state park;
 - D. A great pond that is:
 - (1) One of the 66 great ponds located in the State's organized area identified as having outstanding or significant scenic quality in the "Maine's Finest Lakes" study published by the Executive Department, State Planning Office in October 1989; or
 - (2) One of the 280 great ponds in the State's unorganized or deorganized areas designated as outstanding or significant from a scenic perspective in the "Maine Wildlands Lakes Assessment" published by the Maine Land Use Regulation Commission in June 1987;
 - E. A segment of a scenic river or stream identified as having unique or outstanding scenic attributes listed in Appendix G of the "Maine Rivers Study" published by the Department of Conservation in 1982;
 - F. A scenic viewpoint located on state public reserved land or on a trail that is used exclusively for pedestrian use, such as the Appalachian Trail, that the Department of Conservation designates by rule adopted in accordance with section 3457;
 - G. A scenic turnout constructed by the Department of Transportation pursuant to Title 23, section 954 on a public road that has been designated by the Commissioner of Transportation pursuant to Title 23, section 4206, subsection 1, paragraph G as a scenic highway; or
 - H. Scenic viewpoints located in the coastal area, as defined by Title 38, section 1802, subsection 1, that are ranked as having state or national significance in terms of scenic quality in:
 - (1) One of the scenic inventories prepared for and published by the Executive Department, State Planning Office: "Method for Coastal Scenic Landscape Assessment with Field Results for Kittery to Scarborough and Cape Elizabeth to South Thomaston," Dominie, et al., October 1987; "Scenic Inventory Mainland Sites of Penobscot Bay," Dewan and Associates, et al., August 1990; or "Scenic Inventory: Islesboro, Vinalhaven, North Haven and Associated Offshore Islands," Dewan and Associates, June 1992; or
 - (2) A scenic inventory developed by or prepared for the Executive Department, State Planning Office in accordance with section 3457.

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A summary of scenic resources of state or national significance that are located within an eight-mile radius of the turbines is provided in Table 1 below. Descriptions and evaluations for each resource follow. Potential visibility is based on viewshed analysis within 8-miles from each turbine hub and accounting for topography and 12 meter vegetation (approximately 40 feet)¹⁰. Viewshed analyses are used mainly as a point of departure for identifying areas that may have potential visibility. Viewsheds cannot be relied upon to represent what will actually be seen on the ground from a specific location. Not all turbines, or all parts of turbines, will be seen from every location. An assessment of actual visibility is discussed in Section 4.3.1.F.

Table 1. Summary of Resources of State or National Significance Within 8 Miles

A. NATIONAL NATURAL LANDMARK, FEDERALLY DESIGNATED WILDERNESS OR OTHER OUTSTANDING NATURAL OR CULTURAL FEATURE					
NONE					
B. NATIONAL REGISTER OF HISTORIC PLACES					
	Town	Nearest Visible Turbine	Distance to Nearest Visible Turbine ¹	# of Turbines Potentially Visible within 8 Miles ¹	
Arnold Trail to Quebec ¹¹	Bingham, Concord Twp, Embden, Moscow, Pleasant Ridge Plt, Solon	T1	3.9 mi.	10	
Bingham Free Meetinghouse	Bingham	No Project Visibility			
Caratunk Falls Archaeological District	Embden	No Project Visibility			
Concord Haven	Embden	No Project Visibility			
C. NATIONAL OR STATE PARK					
	Town	Nearest Visible Turbine	Distance to Nearest Visible Turbine ¹	# of Turbines Potentially Visible within 8 Miles ¹	
Appalachian National Scenic Trail	Bald Mountain Twp, Blanchard Twp, Monson	No Project Visibility			
D. GREAT POND					
	Town	Status	Nearest Visible Turbine	Distance to Nearest Visible Turbine ¹	# of Turbines Potentially Visible within 8 Miles ¹
Bald Mountain Pond	Bald Mountain Twp	Outstanding	T54	6.8 mi.	3
Jackson Pond	Concord Twp	Outstanding	No Project Visibility		

¹⁰ 40-foot tree height is very conservative for this area and can have a significant impact on potential visibility. Tree heights in this region are more characteristically 55 feet or higher. Data for Punchbowl Pond is from a modified viewshed, which accounts for shoreline vegetation.

¹¹ The Arnold Trail follows the Kennebec River north through the Project area. The Kennebec River upstream of Wyman Dam is now swollen by the impoundment and no longer exists in its original form. The historic resource is therefore considered “destroyed” in this section. Thus, visibility is only considered for the trail along the Kennebec downstream of the Wyman Dam. Visibility data used for the Kennebec Downstream of Wyman Dam is used for the Arnold Trail. However, there are two identified sites along the Trail, which are not on the river but just offshore. There is no visibility possible from these locations, which are identified in Exhibits 1-4.

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Punchbowl Pond	Blanchard Twp	Outstanding	T57	4.2 mi.	8
E. SEGMENT OF A SCENIC RIVER OR STREAM					
	Towns	Nearest Visible Turbine	Distance to Nearest Visible Turbine¹	# of Turbines Potentially Visible within 8 Miles¹	
Kennebec River - Augusta to the Forks (downstream of Wyman Dam)	Bingham, Concord Twp, Embdem, Moscow, Pleasant Ridge Plt, Solon	T1	3.9 mi.	10	
Kennebec River - Augusta to the Forks (Wyman Lake)	Bingham, Concord Twp, Embdem, Moscow, Pleasant Ridge Plt, Solon	T1	5.6 mi.	12	
Piscataquis River – Howland to West Branch	Abbott, Blanchard Twp, Monson	No Project Visibility			
East Branch Piscataquis River	Blanchard Twp	No Project Visibility			
West Branch Piscataquis River	Blanchard Twp	No Project Visibility			
F. SCENIC VIEWPOINT ON STATE PUBLIC RESERVED LAND OR TRAIL					
	Town	Nearest Visible Turbine	Distance to Nearest Visible Turbine¹	# of Turbines Potentially Visible within 8 Miles¹	
Appalachian National Scenic Trail	Bald Mountain Twp, Blanchard Twp, Monson	No Project Visibility			
G. SCENIC TURNOUT CONSTRUCTED BY DEPT. OF TRANSPORTATION ON A SCENIC HIGHWAY					
	Town	Nearest Visible Turbine	Distance to Nearest Visible Turbine¹	# of Turbines Potentially Visible within 8 Miles¹	
Route 201 Scenic Turnout	Solon	No Project Visibility			
H. SCENIC VIEWPOINT LOCATED IN THE COASTAL AREA					
NONE					

¹Based on visibility within 8-miles from the hub and accounting for topography and 40-foot vegetation. Data for Punchbowl Pond is from a modified viewshed, which accounts for shoreline vegetation.

4.2 Resource Descriptions

4.2.1 Appalachian National Scenic Trail

The Appalachian National Scenic Trail, commonly referred to as the Appalachian Trail or A.T., is a public footpath that stretches over 2,000 miles from Georgia to Maine. The trail was first conceived in 1921, completed in 1937, and was designated as a National Scenic Trail by the National Trails System Act of 1968. It is now maintained by the National Park Service, U.S. Forest Service, Appalachian Trail Conservancy, and other state agencies and volunteer groups. The trail passes to the north of the proposed Bingham Wind Project, and includes the Moxie Bald Lean-to and the Horseshoe Canyon Lean-to. The trail overview in the Official Appalachian Trail Guide of Maine describes this section in this manner:

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“This section traverses wild terrain between Maine Highway 15 north of Monson and U.S. Route 201 at Caratunk near the Kennebec River. After slabbing the side of Doughty and Buck Hills and skirting to the west of Monson alongside Lake Hebron, the Trail crosses the Shirley-Blanchard road and begins the long river walk up the Piscataquis River. This route requires a ford of the East Branch of the Piscataquis just after the Shirley-Blanchard Road and a ford at the confluence of the West Branch of the Piscataquis and Bald Mountain Stream 5.4 miles later. Both of these fords require particular care in high water. The valley and stream walk along the West Branch of the Piscataquis with its deep slate canyons, falls, and quiet pools, offers good swimming and fishing. There are several large stands of “old-growth” white pine and spruce along the West Branch, east of Horseshoe Canyon lean-to. Leaving the valley of the West Branch, the A.T. parallels Bald Mountain Stream, passes Bald Mountain Pond, and traverses Moxie Bald Mountain (2,629 ft.)...” (pg. 77-78)

As a point of interest, the Guide continues to say:

“The A.T. follows the bank of the West Branch of the Piscataquis River for 5 miles along one of the finest river walks in the State. Horseshoe Canyon, with slate walls up to 40 feet high, extends about 0.2 mile in both directions from the lean-to located on the largest of the four meanders of the river. At the east end, the Trail passes through a stand of large white pine. Iron pins and cables provide evidence of the early logging here. The many pools and falls offer swimming along the West Branch. Watch for poison ivy!” (pg. 80-81)

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Photo 1.The Appalachian Trail near Bald Mountain Pond

4.2.2 Arnold Trail to Quebec

The Arnold Trail, which is listed on the National Register of Historic Places, charts the course of Colonel Benedict Arnold's march from Massachusetts to Quebec in 1775. The National Register lists its current functions as recreation, culture, and transportation (also: museum, pedestrian related, road related). For the portion of the Arnold Trail between Williams Dam at Caratunk Falls to approximately the location of the Route 201 scenic turnout, the potential National Register boundary is marked by the margins of the Kennebec River as impounded by Williams Dam and the limits of inundation. According to the American Battlefield Protection papers, "any archaeological sites derived from Arnold March camps would be underwater."¹² From this point north to Wyman Dam, the boundary is drawn from the edge of the river and 50 meters inland, but all property is in private, corporate or individual ownership. Because Wyman Dam was constructed after Arnold's march, the actual route immediately upstream of the dam is now flooded by Wyman Lake and is considered "destroyed."¹²

Typically, users follow the trail on the roads and highways that parallel the river in this area, visiting scenic turnouts, interpretive panels and historic structures along the way (as opposed to

¹² American Battlefield Protection Program Continuation Sheets submitted by the Maine Historic Preservation Commission, surveyed July-September 2001, sheets 9-11

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paddling up river). Through the study area, this would be Route 201. The Arnold Expedition Historical Society owns land and historic easements along much of the 194-mile expedition route, and also maintains hiking trails. However, there are no such maintained properties in the study area, and there are no known associated historic properties along this stretch of river (Battlefield, Sheet 10). There are interpretive panels at Arnold's Way Rest Area along Route 201 at the Bingham town line, which describe the saga of Benedict Arnold, as well as at the scenic overlook located outside the 8-mile radius in Caratunk. In addition, Caratunk Falls in Solon is the only expected location of Arnold's expedition in the Bingham Project vicinity, where Arnold and his army would have camped below the falls at Arnold's Landing before carrying their boats over the falls. However, no historic material from this camp has been found and there is no designated public access at this location. No other identifiable or obvious markers are found within the study area and there is no indication that the Arnold Trail has more than a low level of use.



Photo 2. Photo taken near where it is expected that Arnold and his army put their boats back in the river after carrying them north over the falls. The small “piles” in the lake are man-made features built to help prevent logjams at the falls. The view is northwesterly toward Old Bluff and Fletcher Mountains.

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Photo 3. Entrance to Arnold's Way Rest Area, which includes interpretive panels describing Arnold's march

4.2.3 Bald Mountain Pond

Bald Mountain Pond is a 1,152-acre pond in Bald Mountain Township, just northeast of the town of Bingham. The pond has vehicle access from gravel logging roads and a gravel-surfaced boat launch at the southeastern end of the lake. The Appalachian Trail skirts the northern shore offering additional access to through-hikers. There is a small camping area near the boat launch, and the Moxie Bald Lean-to along the A.T., but otherwise the immediate shoreline is undeveloped. A timber company owns most of the surrounding land and evidence of clear-cuts are apparent on the hills and mountains nearby. More prominent and striking views are away from the Project, north and west toward the bare rocks of Bald Mountain. The vegetation is mixed with pine, cedar, fir, birch and maples, and grows right down to the water. The irregular shoreline, forested islands, rock outcrops and many coves and inlets add visual interest. Bald Mountain Pond is a cold-water fishing destination during the open-water season, especially for trout, and is closed to ice fishing. *Quiet Water Maine* suggests that the pond draws large crowds of people and “camping parties” in summer months, but not as many as nearby Austin Pond. (pg. 212)

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Photo 4. The eastern shore of Bald Mountain Pond shows clear evidence of logging



Photo 5. Looking westerly from the southern tip of the island locate in the northeastern corner of Bald Mountain Pond

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4.2.4 Bingham Free Meetinghouse

The Bingham Free Meetinghouse is a historic meetinghouse located on South Main Street in Bingham. The Meetinghouse was built in 1835 and added to the National Register of Historic Places in 1976. The building is particularly prized for its bell, which was cast in the early 1800s by the son of Paul Revere and brought to Bingham in 1863. The Meetinghouse is owned by the town of Bingham, and is now used for celebrations on Memorial Day and the Fourth of July.



Photo 6. Bingham Free Meetinghouse

4.2.5 Caratunk Falls Archaeological District

The Caratunk Falls Archaeological District is located in the town of Solon, and was added to the National Register of Historic Places in 1986. The District covers the site of several Native American occupations at a carry trail to bypass Caratunk Falls. This same carry trail was used in Colonel Arnold's expedition in 1775, and is also part of the Arnold Trail to Quebec, described in Section 4.2.2.

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Photo 7. Looking north towards the Caratunk Falls Archaeological district. The dam and facility now prohibit access to the area.

4.2.6 Concord Haven

Concord Haven is a Colonial Revival structure located on Route 16 in the town of Embden. It was designed and built by architects John Calvin Stevens and John Howard, and was the home of Mr. J. Leon Williams, a well-known dentist. The site was added to the National Register of Historic Places in 1992.

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Photo 8. Concord Haven as seen from the river

4.2.7 Jackson Pond

Jackson Pond is located in Embden between Old Bluff Mountain and the Kennebec River. It is a relatively small pond at 32 acres and the shoreline is undeveloped. Access to the pond is from a short trail off of an unnamed road, approximately 2.4 miles south of Route 16. It is stocked annually with brook trout and is open for fishing in the summer months, but closed for ice fishing.

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Photo 9. Access path to Jackson Pond

4.2.8 Kennebec River (including Wyman Lake)

The Kennebec River stretches 170 miles from Moosehead Lake to the Atlantic, and passes to the west of the proposed Bingham Wind Project. Wyman Lake was formed in 1930 with the construction of Wyman Dam on the Kennebec River, and was one of the biggest construction projects undertaken in Maine at that time¹³. The 155 feet high and 3,054 feet long gravity dam is partly earthen and partly concrete, and the water impounds for approximately 15 miles behind it. The dam's power plant houses three turbine generators, which are currently being upgraded to 88 MW and will be the largest generating dam in Maine. Both the river and the lake's water levels are controlled by the release schedule of Wyman Dam and the other dams along the river network. Thus, rapidly rising water levels are common between Harris Dam and Solon, which occur multiple times daily.

The stretch of river that meanders southerly downstream of the dam is generally wooded with a gently to steeply sloping shoreline. The river is bordered by both Route 201 to the east and Route 16 to the west, and stretches of the road can be seen and heard at times. Development is denser and readily apparent near Wyman Dam and south until about a mile downstream of the bridge

¹³ <http://www.industcards.com/hydro-usa-me.htm>

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located near the downtown of Bingham, where development becomes spotty or not noticeable. Downstream from Wyman Dam, the Kennebec is most popular for fishing, both wading and by boat, but is highly dependent on water levels. A maintained boat launch, parking lot and picnic area is located just north of the bridge, which provides primary access to the river.

The 3,146-acre Wyman Lake has two public boat launches as well as picnic and recreation areas. The lake's shores are dotted with seasonal and year-round homes, and Route 201 parallels the lake to the east. While the road may not always be visible from the lake, the traffic and associated noise from the highway is ever present. Views to the north and west are more pronounced, which include Pleasant Ridge and long distance views of the mountains that line the Dead River. The lake is popular for its fishing, where visitors may catch smallmouth bass, yellow and white perch, and sunfish in the summer. During winter months visitors may catch landlocked salmon, brook trout, rainbow trout, and smelt in January.



Photo 10. Sign to warn river users about the danger of rapidly rising water, which occurs multiple times daily

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Photo 11. Boat launch located just north and east of the bridge



Photo 12. Looking north from the boat launch – fisherman in a motorboat are visible at the water's edge in the distance

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Photo 13. Looking south and east from the bridge. The swollen river indicates the fluctuating water levels.



Photo 14. Wyman Dam just below the lake

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Photo 15. Looking north on Wyman Lake toward the confluence of the Kennebec River



Photo 16. Looking southeast on Wyman Lake toward the dam and the Project area

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Photo 17. Looking east from Wyman Lake. The cut for Route 201 is visible here.



Photo 18. Looking towards the west shore from Wyman Lake

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Photo 19. Looking northwest from the lake.

4.2.9 Piscataquis River

The Piscataquis River is formed at the confluence of its West and East Branches, northeast from the proposed Bingham Wind Project, and flows southeast to eventually merge with the Penobscot River. The West Branch, East Branch, and the Piscataquis main branch are all designated as scenic in the Maine Rivers Study, with overall “B” ratings. The West Branch parallels a section of the Appalachian Trail east of Bald Mountain Pond, as described in 4.2.1 above. The upper branches are very remote and undeveloped, and the main branch offers Class I-III whitewater boating in the spring and after heavy rains.

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Photo 20. Main Branch of the Piscataquis River along Barrow Falls Road in Blanchard

4.2.10 Punchbowl Pond

Punchbowl Pond is a small, seemingly remote pond situated between Russell Mountain and Little Russell Mountain in Blanchard Township. The 40-acre pond has a generally undeveloped shoreline and is accessible only by a ½ mile foot trail off a rough, unimproved logging road. There is a spot where primitive camping is evident on the southwestern shore, which provides the only clear access to the water. The shoreline and immediate surroundings are fully forested with limited breaks in cover. The gently sloping hills that surround the lake are generally mixed with birch, pine and cedar, while coniferous trees dominate the shoreline. The surrounding area has been cut in recent years, but is not readily noticeable while on the lake. However, the approach to the pond has clear evidence of logging activity. The pond's brook trout fishery is not presently managed.

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Photo 21. Looking northwest over Punchbowl Pond



Photo 22. Looking at the western shore of Punchbowl Pond

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Photo 23. Typical woods along the shoreline at Punchbowl Pond



Photo 24. A broken bridge on the access road limits vehicular travel to Punchbowl Pond

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4.2.11 Route 201 Scenic Turnout

Route 201, which is part of the Old Canada Road Scenic Byway, has a scenic turnout along the Kennebec River north of the town of Solon. The scenic turnout provides background views south to Caratunk Falls and northwest to Old Bluff, Fletcher and Peaked Mountains. The river dominates the foreground along with the man made islands that dot the middle, which were used in the past to prevent logjams. Interpretive panels located at the turnout educate users to the various roles the river has played in the past.



Photo 25. Rt. 201 scenic overlook with interpretive panels describing the history of logging and the importance of the river

4.3 Evaluating Scenic Impact for Resources with Potential Visibility**4.3.1 Evaluation of Potential Impact**

An evaluation of the potential impact to the scenic resources with potential visibility of the generating facilities within 8 miles was conducted using the six criteria outlined in 35-A MRSA §3452.3, and as identified in Section 2.2 of this report. The criteria listed in the Act are very broad and do not clearly dictate how they should be interpreted, nor does the Act specify how they should be presented or the specific tools or definitions that must be used to understand the evaluation criteria. LandWorks has therefore outlined the methods and indicators that were used

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in this analysis to evaluate the criteria's effect on scenic impact. This approach reflects an evolving methodology and effort to develop objective standards and metrics. The indicators, taken collectively, help determine each criterion's contribution to or potential effect on scenic impact.

Based on the evaluation of the indicators, each criterion for each resource is given an overall rating of:

- **NA** = the Project is not visible from the resource or there are no turbines within 8 miles that are visible, therefore there is no effect on scenic impact and the criteria is not evaluated
- **Low** = the criteria's contribution to or potential effect on scenic impact is LOW
- **Medium** = the criteria's contribution to or potential effect on scenic impact is MEDIUM
- **High** = the criteria's contribution to or potential effect on scenic impact is HIGH

The factors considered for each of the statutory criterion include:

- A. Significance of the Scenic Resource** – The assessment of this criterion is based on official state documentation of the resources, field observations and subsequent analysis, surveys conducted for the project, and research of recreational and tourism guides/websites. Indicators include:

- (1) **Documentation.** Resource ratings as designated or defined in the Maine Wildlands Lake Assessment, Scenic Lakes Character Evaluation in Maine's Unorganized Town's¹⁴, Maine's Finest Lakes, The Results of the Maine Lakes Study, Maine Rivers Study and LURC's (now LUPC) 2010 Comprehensive Land Use Plan¹⁵ ("CLUP"). This analysis has adopted the thresholds for significance based on the scenic lakes studies identified by James Palmer¹⁶, which are: a rating of 20 to 35 is Low, 40 to 55 is Medium and 60 or higher is High.

The ratings identified for Bald Mountain Pond in the Scenic Lakes Character Evaluation in Maine's Unorganized Towns are as follows:

¹⁴ Findings from this report were used to identify which lakes were ranked as "Outstanding" or "Significant" in the Maine Wildlands Lake Assessment. The Assessment uses a scoring and rating system for lakes characterized as "Outstanding". These numbers are identified in Table 2.

¹⁵ CLUP Appendix C – Lake Management Program provides "Management Class" ratings for some lakes, which are defined as:

2 Esp high value, accessible (to within ¼ by 2WD), undeveloped lake of regional significance - special values of these lakes are conserved by significantly restricting the density and intensity of development

7 All lakes not otherwise designated – managed for multiple use including resource conservation, recreation, and timber production, giving specific consideration to identified resource values

¹⁶ "Review of the Bowers Wind Project Visual Impact Assessment, Part 2: Independent Analysis" prepared by James F. Palmer, March 8, 2013 (the "Bowers Report")

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CRITERIA	DEFINITION	RATING*	MAX PTS	SCORE
Relief	Two types of relief were evaluated – complex or dramatic.	Medium	30	20
Physical Features	Presence of scenic physical features (Cliffs, vertical ledges, slab ledges, rockslides, boulders, islands and beaches).	High	25	25
Shoreline Configuration	Index of complexity of shoreline based on a lake's variation from a perfect circle.	Medium	15	10
Vegetation Diversity	Presence and diversity of mixed hardwoods or softwoods, softwoods, marsh and the presence of super-story trees.	High	15	15
Special Features	Water clarity and probability of observing wildlife	Medium	15	10
Inharmonious Development	Camps lining the edge of a lake, heavily eroded shorelines, powerlines or roads that are sited intrusively, dammed lakes with drastic drawdowns, dams that are intrusive, etc.	Lo/N	-20	0
Total			100	80

*Rating of None, Low, Medium, or High are as defined by the Scenic Lakes Character Evaluation, not LandWorks

The ratings for Punchbowl Pond are as follows:

CRITERIA	DEFINITION	RATING*	MAX PTS	SCORE
Relief	Two types of relief were evaluated – complex or dramatic.	High	30	30
Physical Features	Presence of scenic physical features (Cliffs, vertical ledges, slab ledges, rockslides, boulders, islands and beaches).	High	25	25
Shoreline Configuration	Index of complexity of shoreline based on a lake's variation from a perfect circle.	Low	15	5
Vegetation Diversity	Presence and diversity of mixed hardwoods or softwoods, softwoods, marsh and the presence of super-story trees.	Medium	15	10
Special Features	Water clarity and probability of observing wildlife	None	15	0

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CRITERIA	DEFINITION	RATING*	MAX PTS	SCORE
Inharmonious Development	Camps lining the edge of a lake, heavily eroded shorelines, powerlines or roads that are sited intrusively, dammed lakes with drastic drawdowns, dams that are intrusive, etc.	Lo/N	-20	0
Total			100	70

*Rating of None, Low, Medium, or High are as defined by the Scenic Lakes Character Evaluation, not LandWorks

Maine Rivers Study has identified 4264 miles of rivers and river segments which possess significant natural and recreational resource values. Rivers, river segments and related tributaries were placed in one of four significance categories, identified as A, B, C, and D. These categories represent a hierarchy of cumulative resource values, and are defined in the Study in the following manner:

- a. Rivers or related corridors on the “A” list possess a composite natural and recreational resource value with greater than state significance. “A” Rivers meet the following criteria:
 - Rivers or river segments possessing six resource values with regional, statewide or greater than statewide significance in a specific resource category.
 - Rivers or river segments possessing two or more resource values which are recognized to be some of the state’s most significant in a given resource category. Included within this category are rivers providing important habitat (defined as self-sustaining viable runs or significant restoration efforts producing fishable populations) for the nationally significant Atlantic sea run salmon.
- b. Rivers and related corridors on the “B” list possess a composite natural and recreational resource value with outstanding statewide significance. “B” Rivers meet the following criteria:
 - Rivers or river segments possessing four or five resource values with regional, statewide or greater than statewide significance in a specific resource category.
 - Rivers or river segments possessing one resource value which is recognized to be one of the state’s most significant in a given resource category.
- c. Rivers and river-related corridors or specific areas on the “C” list possess a composite natural and recreational resource value with statewide significance. “C” Rivers meet the following criteria:

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- Rivers or river segments possessing one to three resource values with regional, statewide significance or greater than statewide significance in a specific resource category.
- d. Rivers and river-related corridors or specific areas on the “D” list possess natural and recreational values with regional significance. “D” Rivers meet the following criteria:
 - Rivers or river segments possessing one or more resource values of regional significance.

Thresholds for significance based on the rivers study have been defined as: Class A rivers are High, Class B rivers are Medium, and Class C and Class D rivers are Low. Kennebec River is classified as a B river and therefore has a rating of Medium.

For the Arnold Trail, available documentation includes the American Battlefield Protection Program Continuation Sheets submitted by the Maine Historic Preservation Commission, completed in 2001, and the National Register of Historic Places nomination forms, completed in 1969. The Battlefield Protection papers provide a more detailed and up-to-date analysis of the different sections of the trail. Using this information, the papers state that the resource is “destroyed” under Wyman Lake, and that of the 14km stretch below the dam, 6km has been “flooded by an hydroelectric impoundment,” 1km of riverbank is “developed as a densely populated village,” 4km has agricultural development, and the remaining 3km is woodland (sheets 9-10). Given that more than ¾ of this stretch of river is either destroyed or developed, the rating is Low.

Table 2. Documentation Rating

Great Ponds	Total Points	Rating
Bald Mountain Pond	80	High
Punchbowl Pond	70	High
Scenic Rivers	Class	Rating
Kennebec River	B	Medium
Historic Site	Rating	
Arnold Trail	Low	

- (2) **Reason for visit.** This indicator considers whether the resource is being visited for its scenic qualities. Typically, a resource that experiences high use due primarily to its exceptional or one-of-a kind scenic feature(s) indicates a higher value or contribution to scenic significance. An example of a resource that would receive a High rating might be Acadia National Park, where the primary reason for the visit is to view the unique landscape. An example of a resource that would receive a Medium rating would be a lake that is visited primarily for its fisheries and quality of fish. While scenery may contribute to the user experience, it is not the primary reason for the visit. An example of a resource that would receive a Low rating would

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be Bingham Free Meetinghouse, since scenery does not contribute to the historic designation of the site and is non-essential to the user visit (i.e. it is visited for other features such as historic architecture).

For each of the scenic water resources identified (Bald Mountain Pond, Kennebec River, Punchbowl Pond and Wyman Lake), visitors are primarily visiting the resource to fish, paddle and in some cases camp, not to view the scenery (see Section 4.3.1.E1 for additional information and conclusions on use). While the views are pleasing, and they certainly contribute to the user experience, they are not unique or spectacular and people are not there for that reason alone. This is confirmed in the Kleinschmidt user surveys, which suggest that fishing and kayaking are the primary reasons for respondents visits to Bald Mountain Pond and Wyman Lake. Therefore, the rating for these resources is Medium.

Users along the Arnold Trail typically travel Route 201 that parallels the river, visiting scenic turnouts, interpretive panel sites, and historic structures along the trail (as opposed to paddling up river). The only defined location in the study area is an interpretive panel site at Arnold's Way Rest Area, which people visit to use the restroom facilities and to read about the march. Scenery provides no significant contribution as to why the user visits this location. Visitors may also stop at one of the unofficial locations along the Kennebec River or Wyman Lake for viewing opportunities of the river or lake, such as the scenic overlook in Solon. In this regard scenery would have a moderate contribution to why users visit here. Therefore, taken together, the rating for this resource is Low-Medium.

- (3) **Uniqueness.** The unique, distinctive or exceptional character of the scenic resource as it exists today – is the resource typical of the region, or does it have special, memorable qualities unlike any other in the area? This indicator considers the physical character of the resource (i.e. landform, vegetation, shoreline configuration, and other special features). This indicator is informed by data research, relevant reports (i.e. 2010 CLUP), accepted methodologies, and most importantly, field study. Often, the greater the physical diversity and intactness of a landscape, the higher its scenic quality and significance. The ratings for uniqueness include the following:
- **Low:** The resource is undistinguished or indistinctive. There is little change in landform, vegetative patterns, water forms, rock formations or other physical characteristics.
 - **Medium:** The resource is common or typical. The resource contains features that vary in landform, vegetative patterns, water forms, shoreline configurations, rock formations, and combinations thereof but tend to be common throughout the region and are not outstanding in visual quality. The undifferentiated hills viewed from Wyman Lake would receive a

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Medium rating for uniqueness (see Photos 26 and 27 that follow – see also Diagrams 3 and 4).

- **High:** The resource is distinctive. The resource contains features of landform, vegetative patterns, water forms, shoreline configurations, rock formations, and combinations thereof that are of unusual or outstanding visual quality. They are usually not common in the region and are one-of-a-kind features. Landscapes that are very scenic or outstanding usually have prominent distinctions between landforms, such as open water in combination with a steeply rising mountain, or have unique focal points and distinct, memorable profiles. The striking profile of Mount Kineo from Moosehead Lake is a good example of a unique and memorable feature, and a resource that would receive a High rating.

Bald Mountain Pond is a relatively pleasing lake with a varied and rocky shoreline, several islands and coves, and an interesting mountain complex on its north shores that display ledge areas with outcrops and dwarfed trees. While these landforms are interesting, they are not visible from all parts of the lake and they are not so distinctive or remarkable that they cannot be found elsewhere in this part of Maine. Moreover, the eastern shore of the lake is not particularly scenic with its low undifferentiated hills and clear evidence of logging. Therefore, the rating for this resource is Medium.

The Kennebec River is one of the three major river systems in Maine and it has scenic qualities and interest along some of the reaches in the Project area with different shoreline configurations, steep slopes and views, but is reduced in uniqueness by the primary section that has an impounded lake and major dam and power generating infrastructure - again a common infrastructural element seen along many of the developed rivers in Maine and Northern New England. Therefore, the rating for this resource is Low to Medium.

Wyman Lake is not a one-of-a-kind landscape, although it has some scenic qualities and long distance views. The change in topography and naturalness of the shoreline is compromised by the visible and audible presence of a major federal highway route and the fact that it is man-made with a large dam/substation power line complex to its south. Therefore, the rating for this resource is Low to Medium.

Punchbowl Pond has an appealing rocky and forested shoreline, and the hills to the north rise steeply from the waters edge. However, they are not so dramatic that the pond is indistinguishable from many similar lakes with regard to size and

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surrounding forested (and harvested) landscapes throughout Maine. Therefore, the rating for this resource is Medium.

The Arnold Trail, from a historic/cultural perspective, can be considered a unique resource and as such is a singular designation in the National Register of Historic Places. The trail represents a particular historical narrative related to a 1775 military campaign, which was part of the American Revolution. The force led by Benedict Arnold followed a route that included the Kennebec River and its associated riverbanks in the Project Area. From a scenic resource perspective, however, the Trail's route through the study area is both on and off the river, and travels through wooded areas when not on the water. The Kennebec does have attributes of scenic quality but these attributes are typical of the river environment and not one-of-a-kind environments. The wooded riverbanks are also typical landscapes found along the Kennebec and other major rivers in Maine. Furthermore, the landscape that the trail travels through is not highlighted or referenced as a contributing factor to its historical significance, and thus is neither unique nor highly scenic. Therefore, the rating for this resource is Low.

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Photo 26. View of Mount Kineo from Moosehead Lake is a distinct and memorable feature in the landscape.



Photo 27. View of rolling, undifferentiated landscape from the eastern shore of Wyman Lake is not prominent or unique.

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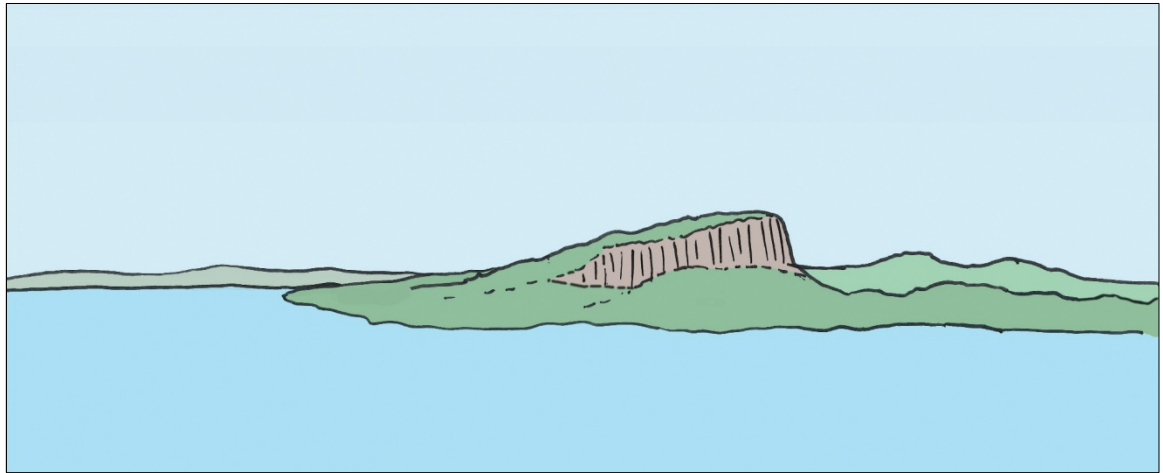


Diagram 3. Example of a distinct landscape with unique or singular scenic qualities due to the geology and geomorphology of the terrain.

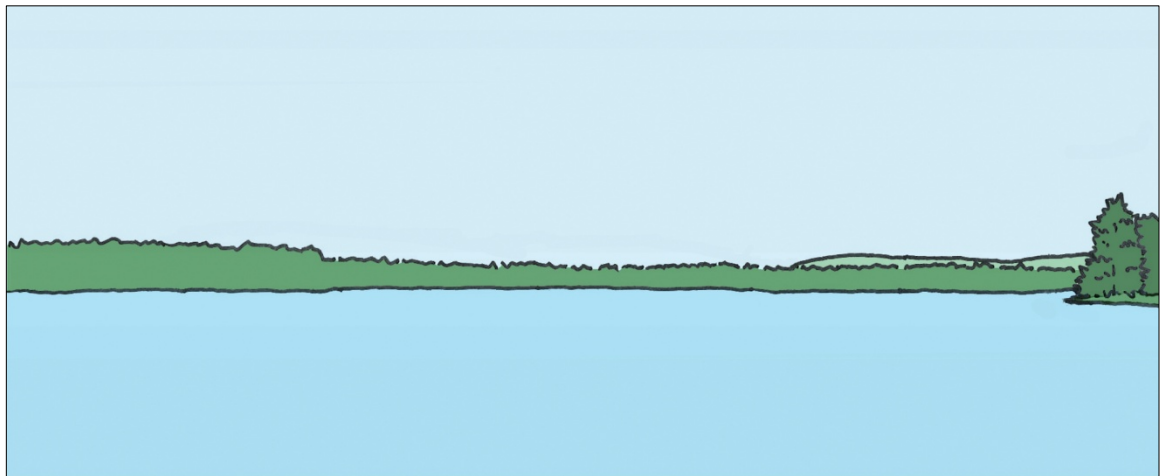


Diagram 4. Typical character of the landscape and terrain as viewed from the lakes and river within the study area. Note the subtle, rolling terrain with low ridges and hills that vary in form, but lack unique scenic values or qualities.

Table 3. Overall Rating – Significance

Resource	Documentation	Reason for Visit	Uniqueness	Overall Rating
Arnold Trail	Low	Low-Medium	Low	Low
Bald Mountain Pond	High	Medium	Medium	Medium
Kennebec River upstream of Wyman Dam (Wyman Lake)	Medium	Medium	Low-Medium	Low-Medium
Kennebec River downstream of Wyman Dam	Medium	Medium	Low-Medium	Low-Medium
Punchbowl Pond	High	Medium	Medium	Medium

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B. Existing Character of the Surrounding Area – The assessment of this criterion is based primarily on field observations and analysis of aerial photography as well as document research. Indicators include:

(1) **Intactness.** The extent to which the existing landscape is free from non-typical visual intrusions. The more man-made elements and by-products of human culture that are present in the landscape, the lower the scenic quality and the lower the sensitivity to change.

- **Low:** The resource is disturbed. Changes are easily noticed by the average person and may attract some attention. The landscape can easily accommodate change.
- **Medium:** The resource has minor disturbances. Changes in the landscape are present but are not readily noticeable by the average person. The natural appearance of the landscape still remains dominant, but change can still be accommodated.
- **High:** The resource is untouched. The landscape is pristine and remains in its natural state. Change in the landscape is not easily accommodated or appropriate.

Wyman Lake is not an intact landscape given that it is a man-made lake that flooded the river valley. Furthermore, the presence of the dam at the head of the lake, residences along the shore in several locations, a major highway along the eastern shore of the lake, and other elements of a developed landscape all are indications that the natural landscape of the area around the lake has been noticeably altered. Therefore, the rating for this resource is Low.

The landscape character of the Kennebec River in the Project area is not at all intact. This is not an undeveloped, highly scenic section of the Kennebec. It has two hydropower complexes, transmission and road corridors running near to or parallel to the river (in many cases these roads are on both sides of the river). The landscape has been altered dramatically with the development of the dams, and the presence of developed areas along its shores such as the village of Bingham. Humans have had a substantive impact on this landscape, and it is far removed from being in an unaltered, natural state. Therefore, the rating for this resource is Low.

Bald Mountain Pond has little in the way of physical intrusions or disturbances, which are limited to the boat launch, and the natural appearance of the landscape remains dominant. However, given the visible evidence of logging activity on nearby hillsides, the resource cannot be considered an untouched, unaltered environment. Therefore, the rating for this resource is Medium.

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Punchbowl Pond does have the appearance of an intact landscape once at the shoreline or on the pond itself. As with many of the lakes and ponds throughout Maine's forested regions this is a deceiving appearance - only a thin strip of intact landscape buffer is in place around the pond (50 feet from on-site observations) and on the approach to the pond there is extensive evidence of logging activity that yields the impression of a landscape that is altered from what it might look like naturally. Thus, the analysis must determine whether intactness is a totally visual concept and to the extent that the intactness of the landscape must include the environs - not just the pond itself. Additionally, the northern shore has not been extensively logged and appears to be relatively intact. In evaluating this criterion it is valid to balance the overall sense of intactness that the pond provides, and this includes the experience of accessing the pond. Given the conditions of the pond environs coupled with the visible landscape from the pond itself, it can be concluded that Punchbowl Pond has a somewhat intact quality, but that this intactness is qualified by the extensive change in landscape quality immediately beyond the shorelines of the pond. Therefore, the rating for this resource is Medium.

The area through which the Arnold Trail is located has not retained the original intactness of the wilderness character it may have had in the 18th century given that 1) a large dam and impounded lake is now present in the area where the trail and river route is located, and 2) a major north-south highway, U.S. Route 201 now parallels both the river and the historic route of the trail. South of the impounded lake area there is some sense of the intact forested river corridor landscape, but this character is compromised by highway development, residences along the river, power line corridors and the audible presence of the major highway, all contributing to a sense that this landscape has been substantively altered by human activity and alteration and is not intact. Therefore, the rating for this resource is Low.

- (2) **Remoteness.** Remoteness indicates the absence of development and a primitive character and experience. Generally, the more remote the resource, the higher its contribution to scenic character, and vice versa. Using the methodology detailed by Palmer in his Bowers report (pg. 22) as a basis, Exhibit 13. Predicted Remoteness demonstrates the levels of development within the study area. No areas are more than 2 miles from a road access, therefore there are no Primitive (P) areas. The Kennebec River and Wyman Lake are considered Semi-Developed Natural (SDN) or Developed Natural (DN), Bald Mountain Pond is Semi-Primitive Motorized (SPM) and Punchbowl Pond is Semi-Primitive Non-Motorized (SPNM). Thresholds for remoteness are defined by the following:

- **Low:** (DN) - Resource is noticeably developed. Interaction between users is moderate to high. There are boat launches, campsites, picnic areas or other maintained facilities, which can accommodate a large number of people (i.e.

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pavilions, parking lots). Motorized or mechanized use is allowed and evident.

- **Medium:** (SPNM, SPM, and SDN) - Resource appears to maintain its natural quality. Development is present but is not always noticeable by the average person and usually harmonizes with the natural environment. Interaction between users may be low to moderate. There are boat launches, campsites, picnic areas or other maintained facilities, but they are limited and not always noticeable. Motorized or mechanized use may be possible.
- **High:** (P) - Resources that are essentially unmodified and pristine. Interaction between users is extremely rare, and evidence of other users is negligible. There are no boat launches, campsites, picnic areas or other maintained facilities. Motorized or mechanized use is not permitted or not possible.

For all the same reasons that Wyman lake is not an intact landscape, given the human influences which created the lake and which are readily visible or audible when on the lake, and, more specifically the proximity to public roads and a major north-south U.S. Highway route, this resource is not at all remote. It also has several maintained boat launches, parking lots, and picnic areas, and interaction between users is relatively high. Therefore, the rating for this resource is Low.

For all of the reasons cited in the Intactness criterion, the Kennebec River is not at all remote and is readily accessed from a number of locations. Additionally, the immediate proximity of Route 16 on the western side of the river, and U.S. Route 201 on the eastern side eliminate any qualities of remoteness. Therefore, the rating for this resource is Low.

Bald Mountain Pond does feel somewhat remote in that it is undeveloped and from the perspective of getting to it, but this is deceiving, as the pond is accessible from several points including the road that leads directly to the boat launch on the south end of the pond. These roads are not well traveled, but another road that leads from Route 16 to Joe's Hole and Moxie Pond, as well as the Appalachian Trailhead at Joe's Hole is more frequently used and readily accessible. This road is about 4 miles to the west of the pond's western shore and as one approaches the A.T. crossing from Route 16, the route crosses numerous logging roads leading easterly towards the pond, and indeed these roads almost encircle the pond except for the northern end on which the A.T. and related conservation lands are located. One of the roads comes very close to the western shore - approximately 1/8 of a mile from the shoreline. Furthermore, LUPC has identified Bald Mountain Pond as Management Class 2, indicating that it is an accessible lake to within 1/4 mile.¹⁷ These factors all combine to reduce the sense of remoteness, as well as the

¹⁷ CLUP Appendix C

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actual remoteness of the pond. However, once on the pond, the natural quality of the environment dominates. Therefore, the rating for this resource is Medium.

Although Punchbowl Pond is undeveloped, it is not a remote pond. There are a number of logging roads within 1/2 mile of the pond, though one must walk or bush whack from these points to reach it. Additionally, there are nearby named public roads (North Shore Rd. around Whetstone Pond and Shirley/Abbot Road) just over a mile and 2 miles in distance from the pond. Once on the pond, the natural quality of the landscape prevails. There are no maintained boat launches and motorized use is not likely, but there is evidence of a primitive campsite. Appendix C of LUPC's Comprehensive Land Use Plan does not specifically categorize Punchbowl Pond, which means that it falls in Management Class 7, indicating that it is managed for multiple use including resource conservation, recreation, and timber production. Based on these factors, the rating for this resource is Medium to High.

While the Arnold Trail route may be located in remote locations elsewhere in the state, the route through the Project area is clearly not remote - with Route 201 adjacent to the trail, dam and power infrastructure, riverside residential development present along the route, and the fact that the trail travels through and adjacent to the developed areas of the towns of Bingham, Solon and Moscow. This is a developed area in Maine and not at all remote. Therefore, the rating for this resource is Low.

Table 4. Overall Rating – Existing Character of the Surrounding Area

Resource	Intactness	Remoteness	Overall Rating
Arnold Trail	Low	Low	Low
Bald Mountain Pond	Medium	Medium	Medium
Kennebec River upstream of Wyman Dam (Wyman Lake)	Low	Low	Low
Kennebec River downstream of Wyman Dam	Low	Low	Low
Punchbowl Pond	Medium	Medium-High	Medium

C. Typical Viewer Expectations – The expectations of the typical viewer can be assessed using a multitude of sources such as background polling, user surveys, studies, guide books, publications, online media, anecdotal and interview sources, as well as general field observations and professional expertise. As such, this assessment requires a judgment informed by both quantitative *and* qualitative data. Indicators include:

- (1) **User surveys.** This indicator accounts for the results of user surveys conducted for a specific resource, in particular, answers to the question “what are your expectations.” The User Survey Report prepared by Kleinschmidt did not ask this question, so this information is not available at this time.

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(2) **Activity.** The type of activity users are engaged in can influence their expectations, since scenic quality may not be central to some types of activities, and vice versa.

Thresholds for activity types include the following:

- **Low:** Activities where visual quality and scenery of the landscape are unimportant to the experience. This would include activities such as visiting museums or historic architecture, or ice fishing in a shanty.
- **Medium:** Activities where visual quality and scenery of the landscape are important but secondary to the experience. This would include activities such as fishing, motorboating, camping, hunting, rafting and snowmobiling.
- **High:** Activities in which visual quality and scenery of the landscape are central to and significantly affect the experience. This would include activities such as paddling, viewing scenery and hiking.

For the Bingham Project area, the primary activities have been identified as rafting (typically floating by inner tube), fishing, paddling (“funyak,” canoe and kayak), ice fishing, hunting, wildlife viewing, snowmobiling and ATV riding, based on comprehensive research as well as user surveys. For Bald Mountain Pond, fishing was identified as the primary activity (71% of respondents) in the User Survey Report prepared by Kleinschmidt. For Wyman Lake, fishing (25%) and kayaking (25%) were identified as the primary activities. Due to low sampling for both of these resources, other documentation and observations were factored in the conclusions (see Table 7. Activities Available/Advertised in the Region). Based on these results, fishing has been identified as the primary activity on the Kennebec River upstream of Wyman Dam (Wyman Lake) and Bald Mountain Pond. Therefore, the rating for these resources is Medium.

There is not conclusive evidence on what the primary activity is for Punchbowl Pond. There are no user surveys and no information is available online, in guidebooks or in reports about the use of the resource. Given the limited and difficult access for boats at Punchbowl Pond (including canoes and kayaks), it is assumed that this is not a common use. There is evidence of camping, and fishing would likely also occur. Therefore these are assumed to be the primary activities for this resource. As such, the rating for Punchbowl Pond is Medium.

Even though rafting is popular along the Kennebec River above Wyman Lake, it is not the primary activity for the stretch of river downstream of the dam. This part of the river is less conducive for whitewater rafting due to the rapidly rising water levels that occur multiple times daily, and the overall lack of rapids. A local outfitter does rent “funyaks,” kayaks and canoes, which can be used to float on this stretch of the river, but the river here is more typically used for fishing, wading or by boat, and

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highly dependent on water levels. This is due to it being home to one of the few self-sustaining populations of rainbow trout, thanks to the cold water released from the dam year-round. Because fishing has been identified as the primary activity for this resource, the rating is Medium.

The primary activity associated with the Arnold Trail is typically related to historic interpretation. This would involve visiting designated sites and structures that parallel the route along the road, not actually canoeing or kayaking up the river. The only designated site along the route in the study area is at the Arnold's Way Rest Area, which includes restroom facilities and picnic tables. At Caratunk Falls it is expected that Arnold's army camped and portaged over the falls, but there are no publicly maintained or accessible locations here. Visitors may also stop at one of the unofficial locations or pull-offs along the Kennebec River or Wyman Lake for viewing opportunities of the river or lake, such as the scenic overlook in Solon. In this regard scenery is not central to the visitor experience but is a contributing factor. Given the type of activity, the developed nature of the area and the fact that the dam impounds most of the resource, the rating is Low for the Arnold Trail.

(3) **Landscape character.** This indicator considers the level of landscape alteration. A viewer's expectation to change in the landscape may be tempered or influenced by the level of alteration already present within and surrounding the resource. The more alterations present in the landscape, the lower the scenic quality and the lower the viewer expectations. Additionally, the remoteness criteria discussed above may affect viewer expectations as well, as people do not expect to see man-made elements in more remote locations.

- **Low:** The resource is altered. Development is easily noticed by the average person and may attract some attention.
- **Medium:** The resource has minor alterations. Development is present but is not always noticeable by the average person. The natural appearance of the landscape prevails.
- **High:** The resource is unspoiled. The landscape is pristine and remains in its natural state. No alterations are visible from the resource, or in the surrounding area of the resource.

Wyman Lake has a typical lakeshore landscape character surrounding it given the wooded hillsides and riverbanks, but this landscape character is also qualified by the presence of human activity and development. Expectations of users are compatible with the landscape character - that this is not a unique, remote or striking landscape, rather a typical Maine lake environment, that affords a pleasing landscape character that accommodates the uses that take place on the water, and at the water's edge. There are some engaging views to the north away from the Project, but overall the

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landscape character is what one would expect at any one of many of the lakes in the region. Therefore, the rating for this resource is Medium.

The landscape character of the Kennebec River in the Project area is varied from highly developed with energy generation and transmission infrastructure, including visible transmission corridors emanating from the Wyman Dam complex to the less developed, broader, braided river channel areas further south. The village of Bingham located along the river adds another developed land use and landscape element to the river corridor, as does the dam complex at Caratunk Falls further south. There are some wooded and less developed sections in the Project area, but overall the sense of this river segment is one of a developed river, with clear evidence of human use, alteration and impact - ranging from some open lands to riverfront residential areas. This is not a highly scenic, undeveloped or remote section of the Kennebec and therefore, in that context, warrants a lower rating. Therefore, the rating for this resource is Low.

The landscape of Bald Mountain Pond is characterized by 3 key elements: 1) the rocky and irregular quality of the shoreline; 2) the lower elevation hills which surround the pond to the south and east, and 3) the presence of Moxie Bald Mountain to the north and west with its outcrops, bald summit and forested slopes. While these elements provide a sense of naturalness, this is not a pristine, untouched landscape. There is access to the pond within ½ mile, a maintained boat launch, and a camping area that can accommodate trailers. Furthermore, there is clear evidence of logging on nearby hillsides. Therefore, the rating for this resource is Medium.

The landscape character surrounding Punchbowl Pond is typical Maine forest landscape with the common species found in this portion of the state - northern hardwoods and softwoods- pines, spruces, fir. The slopes of Russell Mountain rise on the northern shore adding relief and interest to the landscape character. The shoreline configuration is not varied although it is rocky and boulder strewn in places - and the pond has the appearance of its name - a water body set in a bowl. Given these characteristics the pond's landscape character is not overly striking or special, but is pleasing and, despite the surrounding logged lands, the immediate pond itself does exhibit some landscape interest and value. Therefore, the rating for this resource is Medium.

The landscape character of the Project area through which the Arnold Trail is located is human-altered and developed. The landscape is typical of more developed river corridor settings in Maine, with the presence of hydropower facilities, village settlements, residential development, visible logging activity, and a major highway corridor. Therefore, the rating for this resource is Low.

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- (4) **Support for wind power.** This indicator considers people’s understanding of and support for wind power. A person who supports wind power would be more likely to accept a wind power project in view. Polling in Maine has demonstrated public support for wind power, including in areas of high scenic value. For example, a September 2009 Critical Insights on Maine survey, a comprehensive, statewide public opinion survey of registered voters that covers a variety of topics, indicated that 90% of Maine people support wind power development as a way to reduce our dependence on fossil fuels and produce jobs and other economic benefits.¹⁸ A poll conducted by the Pan Atlantic SMS Group for the Maine Renewable Energy Association (MREA) in May 2010, found that 88% support wind power statewide and 83% in the “rim counties,” which are the rural counties where development of wind facilities is more likely.¹⁹ A Critical Insights Maine voter preferences survey conducted in March 2011 found that 82% support development of wind power as a source of electricity.²⁰ Because the majority of respondents to the Kleinschmidt user surveys were year-round Maine residents (100% at Bald Mountain Pond and 67% at Wyman Lake), these polls provide relevant information about how the average user (a year-round Maine resident) views wind power projects. Moreover, the report also indicates that 58% of respondents at Wyman Lake stated that wind power development is “Important” for Maine, and 33% rated wind power as having “Neutral Importance” (pg. 30). 83% of the respondents at Bald Mountain Pond said wind power is “Important” for Maine. Therefore, the suggested rating for this indicator is Low, since a person who supports wind is more likely to accept a wind power project in view, and the majority of respondents from the user surveys support wind power, therefore the contribution to scenic impact would be Low.

Table 5. Overall Rating – Typical Viewer Expectations

Resource	User Surveys	Activity	Landscape Character	Support for Wind	Overall Rating
Arnold Trail	--	Low	Low	Low	Low
Bald Mountain Pond	--	Medium	Medium	Low	Low-Medium
Kennebec River upstream of Wyman Dam (Wyman Lake)	--	Medium	Medium	Low	Low-Medium
Kennebec River downstream of Wyman Dam	--	Medium	Low	Low	Low
Punchbowl Pond	--	Medium	Medium	Low	Low-Medium

¹⁸ Critical Insights, *Critical Insights on Maine Tracking Survey: Residents’ Views on Politics, the Economy & Issues Facing the State of Maine*, November 2009

¹⁹ Pan Atlantic SMS Group, *Report to MREA: Highlights of Survey Findings*, May 2010

²⁰ “Critical Insights: Maine Voter Preference Survey,” Critical Insights, March 2011

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D. Purpose and Context of the Proposed Activity – indicators include:

- (1) **State policy.** This indicator directs the agency to take into account the purpose of the project, which is to generate clean renewable energy, and the context of the project, which is part of a broader policy to encourage the siting and development of wind energy projects within the expedited permitting area. This indicator is not site-specific, but is a more general requirement that the agency consider state policy to encourage the siting of wind energy projects within the expedited permitting area when determining the reasonableness of the visual impacts. 35-A M.R.S.A. §3402(2). The rating for this indicator is therefore Low because the Project fulfills the goals and policies of the state.
- (2) **Significance of the site.** This indicator considers the quality and significance of the project site in relation to the scenic resource. Does the site hold local or state significance or value other than wind generation? Is the site a prominent feature in the landscape? Sites that are not local or regional landmarks are preferable. The Project hills are not prominent and are not cherished features in the landscape, so the rating for this indicator is Low.
- (3) **Limiting new infrastructure.** Does the siting of the project make use of available infrastructure, such as transmission lines, and cluster turbines near other projects so as to minimize the overall impact to the state? The Project proposes to improve 5.3 miles of existing 24-foot access roads and will connect to an existing Central Maine Power (CMP) substation in Parkman, Maine that will require an approximately 17-mile 115 kV electrical generator lead transmission line. The collector lines will also be put underground except for a short stretches. The rating for this indicator is Medium because the Project will be using existing roads and tapping into an existing substation, but will require additional construction of access roads and clearing for the generator lead transmission line.

Table 6. Overall Rating – Purpose and Context of the Proposed Activity

Resource	State policy	Significance of the site	Limiting new infrastructure	Overall Rating
Arnold Trail	Low	Low	Medium	Low
Bald Mountain Pond	Low	Low	Medium	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	Low	Low	Medium	Low
Kennebec River downstream of Wyman Dam	Low	Low	Medium	Low
Punchbowl Pond	Low	Low	Medium	Low

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E1. Extent, Nature and Duration of Public Use of the Scenic Resource – The assessment of this criterion is based on a multitude of sources such as background polling, user surveys, studies, guide books, publications, online media, anecdotal and interview sources, as well as general field observations and professional expertise. Because reliable, quantitative data is not always available, this assessment requires a judgment informed by both quantitative *and* qualitative data. Note that this criterion does not assess impact to scenic quality, but simply what is the use and how frequently is it used and by whom. This criterion then provides the information necessary to assess viewer expectations and effect on continued use and enjoyment of the resource. Indicators include:

- (1) **Extent.** This indicator measures the amount of use of the resource. This can be determined quantitatively by user surveys. However, when this information is not available, or not statistically reliable, other measures must be used to ascertain extent of use. This includes qualitative considerations: how easy or difficult is the resource to access, and what types of facilities are available that may attract potential users (e.g. campgrounds, picnic areas, boat launches, beaches, etc.). Resources that are more difficult to access are typically less visited and therefore experience lower overall use. Likewise, the easier the access the higher the potential for use. Resources with available and attractive facilities such as campgrounds, boat launches, picnic areas or beaches, also tend to draw in more users. Therefore, thresholds for extent of use are defined by the following:
- **Low:** Resources that are essentially unmodified and pristine. Interaction between users is extremely rare, and evidence of other users is negligible. There are no boat launches, campsites, picnic areas or other maintained facilities. Motorized or mechanized use is not permitted or not possible.
 - **Medium:** Resource appears to maintain is natural quality. Development is present but is not always noticeable by the average person and usually harmonizes with the natural environment. Interaction between users may be low to moderate. There are boat launches, campsites, picnic areas or other maintained facilities, but they are limited and not always noticeable. Motorized or mechanized use may be possible.
 - **High:** Resource is noticeably developed. Interaction between users is moderate to high. There are boat launches, campsites, picnic areas or other maintained facilities, which can accommodate a large number of people (i.e. pavilions, parking lots). Motorized or mechanized use is allowed and evident.

The Kleinschmidt user surveys suggest that an average of 8 people visited Wyman Lake per day during the month of September 2011. The greatest number of people (13) was observed on Saturday, September 1 followed by 11 people on Saturday,

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September 15. During the week, 7-8 people were observed at Wyman Lake. The Kleinschmidt report also cites other studies, which measured use for all of Wyman Lake's recreation areas. These numbers include five areas outside the 8-mile project radius: "In 2002, FPL Energy estimated the project supported almost 69,000 daytime recreation days, and another 700 overnights from public access areas (TRC Engineering, 2009). Recreation use for 2008 was reported to be approximately 77,000 recreation days, and nighttime use was estimated to be 4,300 recreation days. Recreational usage at the Wyman Project was highest in summer (62%), followed by spring (19%), then fall (13%), and was lowest in winter (6%)." (Kleinschmidt pg. 8) Given that this data includes other areas outside the 8-mile radius, and is much higher than the actual user numbers observed by Kleinschmidt, the rating for Wyman Lake is Medium.

No survey or quantitative data is available for the Kennebec River; therefore, qualitative measures are considered, which are informed by document research and field observations. There are several boat launches and picnic areas along the river, which are not all officially designated or maintained, and use of these facilities is low to moderate. Route 201 and Route 16 parallel the river and provide additional points where people may access the water to wade or fish from shore. There are stretches of development along the river, which include the dam and substation, agricultural fields, private properties, and the highway. While development is present, it is not always noticeable and not a deterrent for users since people are here for the quality of the fishery (i.e. Rainbow trout). Less than 2 miles of this roughly 9-mile stretch of river is wooded (approximately 20%). Motorized use is possible on the Kennebec River and accessed by a maintained boat launch just north of the bridge. Based on this information, the rating for the Kennebec River is Medium.

Bald Mountain Pond is an out of the way lake accessible via a series of gravel logging roads off of Route 16, with a gravel boat launch and camping area at the southern tip. Field observations and document research indicate that the pond receives a fair amount of use, as well as the fact that there is an A.T. shelter near the northern shore. *Quiet Water Maine* suggests that the pond draws large crowds of people and "camping parties" in summer months. (pg. 212) The Kleinschmidt surveys, however, suggest a lower amount of use. The highest number of people observed at Bald Mountain Pond over Labor Day weekend was 16 and 10 people on Saturday, September 1 and Sunday, September 2, respectively. The rest of the weekdays, 0-2 people were observed. On average, 5 people per day were observed at Bald Mountain Pond. Therefore, this resource receives a rating of Low-Medium.

No survey or quantitative data is available for Punchbowl Pond; therefore, qualitative measures are considered, which are informed by document research and field

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observations. The difficult access to the pond limits overall use. No people were observed at the lake on the two occasions it was visited, and no information is available online, in guidebooks or in reports about the use of the resource. There are no maintained facilities and use of motorized boats is not possible. The fisheries are also not maintained or stocked here, so it is not a draw for most fishermen. Therefore, Punchbowl Pond receives a rating of Low.

Although the actual route of Arnold and his men follows the Kennebec River and its banks, visitors along the trail typically travel the highway that parallels the river. An article in the Lewiston Daily Sun suggests that the “Arnold Trail parallels roads and highways and attracts thousands of visitors yearly, especially during the summer.”²¹ The use of this resource is typically related to historic interpretation, which includes visiting designated sites and structures along the route, but not actually canoeing or paddling up the river. The only clearly defined site along the route in the study area is at the Arnold’s Way Rest Area in Bingham, which includes interpretive panels, restroom facilities and picnic tables. Visitors may also stop at the overlook in Solon to get a view of the river and read about the history of logging, but this location is not a designated stop along the route. There is no evidence of use directly related to touring the trail and visiting the rest area, the overlook or traveling the highway for that purpose alone; but, given the accessibility of these locations and the developed nature of the sites (major highway, restroom facilities, paved parking areas, interpretive panels, moderate to high interaction between users), it is reasonable to conclude that the trail receives a high amount of use, though many of those visitors may not be there to visit the trail specifically (i.e. they are stopping to use the facilities or view the river for other purposes). Therefore, the rating for this resource is Medium-High.

- (2) **Nature.** This indicator considers how the resource is being used and what are the primary activities. For this indicator, the same assumptions that were applied in C.2 above are used. Thresholds for activity types include the following:
- **Low:** Activities where visual quality and scenery of the landscape are unimportant to the experience. This would include activities such as visiting museums or historic architecture.
 - **Medium:** Activities where visual quality and scenery of the landscape are important but secondary to the experience. This would include activities such as fishing, motorboating, ice fishing, camping, hunting, rafting and snowmobiling.
 - **High:** Activities in which visual quality and scenery of the landscape are central to and significantly affect the experience. This would include activities such as paddling, viewing scenery and hiking.

²¹ <http://news.google.com/newspapers?id=kpwgAAAIBAJ&sjid=JmgFAAAAIBAJ&pg=5029%2C2794642>

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For the Bingham Project area, the primary activities have been identified as rafting, fishing, paddling (canoe and kayak), ice fishing, hunting, wildlife viewing, snowmobiling and ATV riding, based on comprehensive research as well as user surveys. For Bald Mountain Pond, fishing was identified as the primary activity (71% of respondents) in the User Survey Report prepared by Kleinschmidt, followed by kayaking (14%) and camping (14%). For Wyman Lake, fishing (25%) and kayaking (25%) were identified as the primary activities, followed by viewing scenery (19%), observing nature/wildlife (19%), and swimming (13%). The consistency between activities indicated in the Kleinschmidt survey, with activities in previous reports, as referenced in the Kleinschmidt report, suggests that the survey results reflect typical recreation uses. However, additional research, documentation and observations were still conducted to supplement the surveys, since they are considered qualitative.

A comprehensive review of websites, guidebooks, and brochures obtained from local retailers, as well as personal observations, yielded information on the types of activities available in the region. Table 7 below provides an overview of the results of this work.

Table 7. Activities Available/Advertised in the Region

NAME	WEBSITE	LOCATION	OFFERINGS MENTIONED										
			Lodging	Rafting	Snowmobile	ATV	Hunting	Fishing	Kayak	Canoe	Wildlife	Other	
Adventure Bound	adv-bound.com	Caratunk		X							X		Rock climbing
Bennett Hill Lodge	bennethilllodge.com	Parkman	X										
Bingham Motor Inn	binghammotorinn.com	Bingham	X										
Breakneck Ridge Farm	breakneckridgefarm.com	Blanchard Twp											Farm visits
Breezy Acres Camps	breezyacrescamps.com	Solon	X				X	X					
Bucks Point Sporting Lodge and Camps	buckspointsportinglodge.com	Solon	X				X	X			X		Photography
Bullfrog Adventures	bullfrogadventures.com	Caratunk							X	X			Tubing
C. Moxie Gore Outfitters	cmoxiegore.com	Moxie Gore Twp	X										
Cedar Mill Guide Service & Cabins	No website	Athens	X		X		X	X		X			
Crab Apple Whitewater	crabapplewhitewater.com	The Forks	X	X									
Donahue's Old Bluff Cabins & Guide Service	oldbluffcabins.com	Concord Twp	X		X	X	X	X			X		
Evergreens Campground	evergreencampground.com	Solon	X					X	X	X			

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Table 7. Activities Available/Advertised in the Region

NAME	WEBSITE	LOCATION	OFFERINGS MENTIONED										
			Lodging	Rafting	Snowmobile	ATV	Hunting	Fishing	Kayak	Canoe	Wildlife	Other	
Fletcher Mountain Aviation	fnaviation.com	Bangor											Scenic flights in Bingham
Gateway Recreation & Lodging	gateway-rec.com	Bingham	X	X				X	X				
Good Excuse Guide Service and Lodge	good-excuse.com	Parkman	X		X	X		X	X				
Grey's Outfitting	greysoutfitting.com	Caratunk	X					X					
Magic Falls Rafting Company	magicfalls.com	West Forks	X	X									Rock climbing
Maine Wilderness Tours	mainewildernesstours.com	Belgrade	X	X				X	X				
Moxie Outdoor Adventures	moxierafting.com	The Forks	X	X						X	X	X	
North Country Rivers	ncrivers.com	Bingham	X	X	X	X						X	
Northeast Guide Service	northeastguideservice.com	Greenville		X						X	X	X	Hiking
Northern Outdoors	northernoutdoors.com	The Forks	X	X	X	X		X	X				
Old Canada Road Historical Society	rootsweb.ancestry.com/~meocrhs	Bingham											Historical collections
Pine Grove Lodge & Guide Services	pinegrovelodge.com	Bingham	X					X	X		X	X	Hiking
Professional River Runners	proriverrunners.com	West Forks	X	X							X	X	Hiking
Schoolhouse Brook Guide Service	No website	Caratunk						X	X	X	X		
SledHead Ventures	sledheadventures.com	Jackman			X								
Song in the Woods	songinthewoods.com	Abbot	X										Dogsledding, skiing, snowshoeing
Sunrise Ridge Guide Service & Sporting Camps	sunriseridgeguide.com	Bingham	X	X	X	X		X	X				
Three Rivers Whitewater	threeriverswhitewater.com	The Forks	X	X					X	X		X	
Windfall Rafting	windfallrafting.com	Jackman		X									Hiking
Quiet Water Maine: Canoe and Kayak Guide										X	X		
An Explorer's Guide to Maine 16th Ed.				X	X	X							
Fishing Maine, 1st and 2nd Ed.									X				
Maine Office of Tourism	visitmaine.com		X	X	X	X		X	X	X	X	X	Skiing, bicycling, hiking
Maine Resource Guide	maineguide.com			X					X				
Kennebec Valley Tourism Council	kennebecvalley.com		X	X	X	X		X	X	X	X	X	Hiking, golf, skiing, snowshoeing
Raft Maine	raftmaine.com			X									
Moose Alley Riders ATV Club	moosealleyriders.com	Bingham				X							

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Table 7. Activities Available/Advertised in the Region

NAME	WEBSITE	LOCATION	OFFERINGS MENTIONED										
			Lodging	Rafting	Snowmobile	ATV	Hunting	Fishing	Kayak	Canoe	Wildlife	Other	
Wellington Wheelers ATV Club	facebook.com/pages/Wellington-Wheelers-ATV-Club-220064918020542	Wellington				X							
Fly Fishing Only	maineflyfishing.com	Fairfield						X					
Maine Trail Finder	mainetrailfinder.com											Hiking, skiing, mtn. biking, snowshoeing	
Maine Snowmobile Association	mesnow.com				X								
TOTALS			24	18	11	10	14	18	9	12	10	Hiking (7) Rock climbing (2) Skiing (3) Snowshoeing (3)	

Based on survey information, document research and field observations, as well as the reasoning described in 4.3.1.C.2, fishing (either by boat or wading by shore) has been identified as the primary activity on Bald Mountain Pond and the Kennebec River upstream of Wyman Dam (Wyman Lake). Other activities that occur to a lesser degree at Wyman Lake include swimming, paddling and viewing scenery. Due to evidence of a primitive campsite and the limited and difficult access for boats at Punchbowl Pond (including canoes and kayaks), fishing and camping have been identified as the primary activities for this resource, but viewing wildlife or scenery may also be possible. For the Kennebec River downstream of Wyman Dam, fishing (either by boat or wading by shore) is identified as the primary activity. Because fishing and camping are activities where visual quality and scenery of the landscape are important but secondary to the experience, and viewing scenery may be conducted at some resources but not the primary activity for most users, the rating for all the water resources is Medium. For the Arnold Trail, historic interpretation is the primary activity. Although scenery is not critical at Arnold’s Way Rest Area, the river and landscape also played an important role in Arnold’s journey. Therefore, this resource is given a Low to Medium rating.

- (3) **Duration.** This indicator considers the length of time a user is engaged in an activity at the resource, or how long they are visiting the resource. Typically, the longer a user spends recreating or visiting a scenic resource, the higher the potential for

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impact. The opposite is true for shorter time periods, which would have a lower impact.

All of the respondents at Bald Mountain Pond were year-round Maine residents. Two-thirds of the respondents at Wyman Lake were Maine residents while the remaining one-third were nonresidents. None of the respondents owned or rented property at Wyman Lake or Bald Mountain Pond.

Most respondents (65%) reported they had visited the interview site before and, on average, had been visiting for 20 years (median=15 years) and made multiple visits per year (average of 8 trips per year, median of 5 trips per year). It was the first visit to Wyman Lake for 5 of the 16 respondents, and it was the first visit for 3 of the 7 respondents at Bald Mountain Pond.

For Bald Mountain Pond, 2 of the 7 respondents stayed for 3-4 hours. The other 5 respondents visited for 2 days. At Wyman Lake, one respondent said they stayed all day (24 hours). The other 15 respondents visited for 10 minutes to 6 hours. The average trip length at Wyman was 4.2 hours and the median was 3 hours. Since most visitors to these two ponds were staying for 4 hours or more, the duration of use is assumed to be High.

For Punchbowl Pond, it is expected that visitors will spend extended periods of time at the pond, camping and fishing, in part due to the difficulty in access. Therefore, the duration of use is assumed to be High.

For the Kennebec River, fisherman, canoeists or paddlers are expected to spend about the same time as people on Wyman Lake, or possibly a couple hours less given the ease of access and location near shore (moving on and off the water as one wades up and down the river). Therefore, the duration of use for this resource is assumed to be Medium-High

For the Arnold Trail, it is expected that most users are making short stops at various locations along the route, at the rest area or at pull-off's along the highway. These stops would likely be less than a ½ hour. Therefore, duration for this resource is assumed to be Low.

Table 8. Overall Rating – Extent, Nature and Duration of Public Use of the Scenic Resource

Resource	Extent	Nature	Duration	Overall Rating
Arnold Trail	Medium-High	Low-Medium	Low	Low-Medium
Bald Mountain Pond	Low-Medium	Medium	High	Medium
Kennebec River upstream of Wyman Dam (Wyman Lake)	Medium	Medium	High	Medium

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Table 8. Overall Rating – Extent, Nature and Duration of Public Use of the Scenic Resource

Resource	Extent	Nature	Duration	Overall Rating
Kennebec River downstream of Wyman Dam	Medium	Medium	Medium-High	Medium
Punchbowl Pond	Low	Medium	High	Medium

E2. The Project’s Effect on Continued Use and Enjoyment of the Scenic Resource – In effect, this is the key issue in terms of impact to users of the resource – does the project adversely impact their use so much so that they will not come back? This criterion is analyzed by synthesizing all the information reviewed under the other criteria as well as through the application of user surveys and other available data (background polling, studies, guide books, publications, online media, anecdotal and interview sources, as well as general field observations and professional expertise). As such, this assessment requires a judgment informed by both quantitative *and* qualitative data. Indicators include but are not limited to:

- (1) **Scenic Change.** This indicator considers how users’ opinions about scenic quality change when a wind power project is within view. Although the results are not statistically reliable, the Kleinschmidt surveys provide one source of information that is considered with all the other information obtained from document research. The Kleinschmidt survey asked respondents to rate the scenic value of a view from Wyman Lake or Bald Mountain Pond with and without turbines on a scale from 1 to 7 (1 meaning “lowest scenic value,” 4 meaning “typical scenic value,” and 7 meaning “highest scenic value”). For Wyman Lake, 27% (4 people) of respondents rated the current conditions view as typical, and 74% (11 people) rated it as high scenic value. Under simulated conditions, 21% (3 people) rated Wyman Lake as low, 21% (3 people) as typical, and 57% (8 people) as high. Even though the number of respondents rating the view for high scenic value only dropped by 3 people, and 1 person for typical, 78% still found views typical or scenic, therefore the effect on scenic value is Low for Wyman Lake.²²

²² In August, 2012, LandWorks prepared the visual simulations that were used in the intercept surveys conducted at Wyman Lake and Bald Mountain Pond and that are reported in the Kleinschmidt Survey Report. Those simulations are included as Attachment C to the Kleinschmidt Survey Report. Since that time there has been a change in the turbine model and adjustments to the turbine layout. Specifically, the turbines reflected in the August, 2012 simulations had a hub height of 99.5 meters and a blade diameter of 113 meters, whereas the current turbine has a lower hub height of 94 meters and a shorter blade diameter of 112 meters. There have also been some refinements to the visual simulations (including, for example, adjustments to the viewer angle, 3D model/photo registration, and presentation size). As a result, there are some minor differences between the simulations used in the intercept surveys (August, 2012) and the simulations in the VIA (April, 2013). The changes to the simulations of the project from Bald Mount Pond are very subtle, and likely are not noticeable to the average viewer. These changes include the presentation size and extremely minor shifting of turbine positions in relation to the ridgeline. The changes at Wyman Lake included an increase in the number of visible turbines from 6 (August, 2012) to 8 (April, 2013), shifting of turbine positions, increased visibility of the turbine hubs/towers, and presentation size. Refinements to the registration of the 3D model and photo resulted primarily in the increased visibility. It should be noted that one of the turbines visible in the April, 2013 simulation at Wyman Lake will not be constructed, as the simulation reflects an alternate turbine location. The changes to the Wyman Lake simulation, although not dramatic, could be detectable by the average viewer.

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For Bald Mountain Pond, 100% of respondents (7 people) indicated that the current view had high scenic value. Under simulated conditions with wind turbines, responses shifted to 14% (1 person) low, 14% (1 person) typical, and 71% (5 people) high. Even though the number of respondents rating the view for high scenic value dropped by 2 people, 85% still found views typical or scenic, therefore the effect on scenic value is Low for Bald Mountain Pond.

It is curious to note that respondents were still impacted by the wind power project even though visibility of the turbine blades are barely perceptible through the trees and limited to a small portion of the lake. Indeed, as noted in the Kleinschmidt Report, during the first day of surveying almost all of the respondents (on both lakes) asked for the turbines to be pointed out to them. Thus, even though it was difficult (and apparently impossible for some) to pick out the turbines, the mere potential for visibility apparently impacted responses. Kevin Boyle identifies two strategies that may be employed by respondents to perception surveys, which may help explain this result. See Pre-Filed Direct Testimony of Kevin Boyle in the Bowers Wind Project, #L-25800-24-A-N/#L-25800-TE-B-N (“Boyle Testimony”). Specifically, people who are uncertain about an outcome of a change may employ a precautionary strategy, which results in people erring on the side of being conservative when asked about the impact of a project that they are not actually observing. Boyle Testimony at 8. Similarly, people who fear that a change might result in an undesirable outcome may employ what is known as hyperdefensiveness strategy, which is directed at reducing anxiety and avoiding a negative outcome. *Id.* As with the precautionary strategy, this results in respondents answering perception survey questions in part based on their fear of the future outcome, and not necessarily what they actually see (or don’t see).

No survey data was available for Punchbowl Pond, Kennebec River downstream of Wyman Dam, or the Arnold Trail. The scenic attributes and visibility conditions on Punchbowl Pond are similar to Bald Mountain Pond, where only the tips of blades may potentially be visible through the trees, and for only a small portion of the lake. Therefore, it is assumed that the scenic affect will be similar and Punchbowl Pond is also rated as Low. The Kennebec River has been determined to not be highly scenic through this stretch, and it has very limited visibility. From the boat launch and below the dam, where activity is greatest, there will be no visibility. For the small stretch where visibility is most likely (i.e. location of the visual simulation), a person would need to be facing the direction of the Project in that particular location, and given that most people fish near the shoreline and are continually wading up and down stream, visibility will be diminished. Moreover, other visible intrusions in the landscape temper the affect of possible views of the Project, including industrial uses, the highway, powerlines, and the developed town center. Based on these factors, the

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rating for the Kennebec River is Low. For the Arnold Trail there is no visibility from the designated historic interpretation points along the route, or from any of the unofficial pull-off areas along the highway, or along the highway itself. However, since the actual trail does follow the river, ratings given to the Kennebec River are also taken into account. In either case, the rating is Low.

- (2) **Effect on enjoyment.** This indicator considers how a wind power project in view would effect their enjoyment. The Kleinschmidt survey asked respondents how the wind turbines would affect their enjoyment of Wyman Lake or Bald Mountain Pond on a scale from 1 to 7 (1 meaning “very negative effect,” 4 meaning “no effect,” and 7 meaning “very positive effect”). Overall, 73% and 57% of respondents at Wyman Lake (11 out of 15 respondents) and Bald Mountain Pond (4 out of 7 respondents), respectively, said that the turbines would have no effect or a positive effect on their enjoyment. As discussed above, people may have responded hyperdefensively to this question at Bald Mountain Pond for fear of change, even though the visibility is limited to a very small portion of the lake, and almost imperceptible. At Wyman Lake, there is no visibility from the Pleasant Ridge boat launch, and once on the water, visibility will be limited to a small portion of the overall lake, and at distances greater than 6 miles. In either case, the majority of respondents indicated that the turbines would have no effect or a positive effect on their enjoyment.

The type of activity must also be considered when evaluating effect on enjoyment. An activity with a fixed and involuntary view of a project would have a higher potential for impact, whereas an activity with limited exposure to the view would have lower potential for impact, either due to the limited extent of visibility from the resource or because the context and nature of the user’s activity allows for other unaffected views. Thresholds include the following:

- **Low:** Activities whose focus would be away from a project or would be constrained due to limited viewing opportunities (e.g. ice fishing in a shanty; visibility limited to small portion of the resource). Impact may also be low due to limited use of the resource (i.e. as resource activities/visitation decreases the duration of view decreases).
- **Medium:** Views of a project would be tempered by focusing on the activity (i.e. fisherman focusing on the water), shifting location and altering context and viewpoint (i.e. views are continually changing as in rafting, motorboating or fishing), and access to 360° views. In this situation, the impact potential lessens, because, although views would be present, they would be ever-changing and mitigated by the activity.
- **High:** Activities whose primary focus would be toward a project and fixed on a project. For example, a scenic pull-off with static, unchanging views

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focused entirely on a project site would have a high potential impact, even though a visitor may only stay at the site for 5 to 10 minutes.

The primary activities identified in 4.3.1.E1 above inform this indicator, as well as the overall potential for visibility of the Project as outlined in 4.3.1.F that follows. For each of the water resources (Bald Mountain Pond, Kennebec River, Punchbowl Pond and Wyman Lake), fishing is identified as one of the primary activities. Fishermen are typically more focused on the water, the shoreline and their activity; therefore, any potential views to the Project are tempered by shifting locations and focal points. If people are fishing at or near the boat launches at Bald Mountain Pond, Kennebec River, and Wyman Lake, or near the campsite at Punchbowl Pond, no visibility is possible from these primary locations. While viewing scenery and paddling are more affected by visual quality, the visibility of the Project is so limited or undetectable for most of these resources that the impact on the activity is greatly diminished or inconsequential. Only Wyman Lake has the greatest potential for visibility. Therefore, based on the types of activities and the limited amount of exposure to views, Punchbowl Pond, the Kennebec River and Bald Mountain Pond are rated Low. Wyman Lake's visibility is somewhat higher and is therefore given a rating of Low to Medium. Activities associated with the Arnold Trail are typically related to historic interpretation, which involves visiting designated sites. There is no visibility from specific visitor locations, and even if a person were to follow the actual route along the river, viewing opportunities are very limited and would also be tempered by shifting locations and focal points, as well as the presence of other intrusions in the landscape. Therefore, the rating for Arnold Trail is Low.

- (3) **Effect on continued use.** This indicator is in effect the most critical as it considers if users will return and continue to use the resource. The survey asked respondents to rate their likelihood of returning to Wyman Lake or Bald Mountain Pond under current conditions on a scale from 1 to 7 (1 meaning "very unlikely," 4 meaning "neither unlikely nor likely," and 7 meaning "very likely"). For Wyman Lake, 6% (1 of 16 people) responded that they were unlikely to return, 13% (2 of 16 people) neither unlikely nor likely, and 81% (13 of 16 people) likely. For Bald Mountain Pond, 100% (7 people) responded that they were likely to return. Respondents were then asked how the presence of wind turbines would affect their likelihood of returning on a scale of 1 to 7 (1 meaning "very unlikely," 4 meaning "no effect," and 7 meaning "very likely"). For both Wyman Lake and Bald Mountain Pond, 80% (12 of 15 and 4 of 5 people, respectively) of respondents were either unaffected or likely to return when the wind turbines were in view. Twenty percent of respondents (4 of 20 people) were unlikely to return mainly because they thought turbines are unnatural and would ruin the wilderness and natural beauty. However, 30% of respondents (6 of 20 people) were likely to return because they thought turbines were "awesome and

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cool looking,” won’t affect their activity, they support wind power, they like the pond/area, or turbines don’t impact their decision to return. The other 50% of respondents (10 people) were unaffected because they didn’t think they’d notice the turbines, or if the turbines aren’t noticeable they won’t affect the scenery. Given that 80% of respondents were unaffected or likely to return, effect on continued use for these two resources is Low.

No survey data is available for Punchbowl Pond, the Kennebec River, or the Arnold Trail. The visibility and character of Punchbowl Pond is similar to Bald Mountain Pond in that it is an out of the way location and there is little to no development. Activities are also the same, which include camping and fishing. There is no visibility of the Project from the camping area and the majority of the lake, and given that most users may not actually paddle the lake, duration of views are greatly limited. Additionally, the point along the shoreline where the most visibility is possible is at the opposite side of the lake, away from the access point and camping area, and overhung by deciduous trees; therefore, visibility of the turbines is not likely to be a factor in whether or not users return. Therefore, the effect on continued use is assumed to be Low for Punchbowl Pond.

The majority of the Kennebec River has no visibility. From some of the primary fishing locations below the dam and wading along the shoreline, there will be no visibility. Fisherman will also be fixated primarily on their activity and not turbines in view, if there are any. For potential “funyak,” kayak or canoe users, potential visibility is limited to a short stretch of river near the town center of Bingham, and even here views will be constrained due to intervening vegetation and topography, or tempered by other intrusions in the landscape. Beyond this stretch, the Project moves behind the user as they are traveling south downstream. From the next area of possible visibility (where the visual simulation was taken from), views of the Project are only possible if users are traveling north up the river, and are on the west side of the river. Otherwise, the Project will not be visible. Given these factors, the effect on continued use is assumed to be Low for the Kennebec River.

There is no visibility from specific visitor locations along the Arnold Trail, and even if a person were to follow the actual route along the river, viewing opportunities are very limited and would also be tempered by shifting locations and focal points, as well as the presence of other intrusions in the landscape. Furthermore, historic interpretation of the trail is not dependent on the visual quality of the landscape, and this area is already altered and significantly different than the way it looked in the 18th Century when Arnold and his man forged the river. Therefore, the effect of the Project on the continued use of the Arnold Trail is Low.

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(4) **Other survey information.** Because user surveys for specific resources are not always available, or in this case not necessarily statistically significant, results of other surveys and studies are examined to help inform how users may be impacted by a wind power project. A number of wind power projects in Maine have utilized intercept surveys to evaluate public use, user expectations, and impact of project visibility on use and enjoyment of scenic resources. Although there are limitations to the intercept and other forms of surveys, they provide information on recreational uses and user expectations that, when synthesized with other data, helps inform our evaluation of the review criteria under the Wind Energy Act.²³ Table 9 that follows indicates that the proportion of the respondents to the Bingham survey who reported a positive impact of seeing a wind farm while recreating (23%) is similar to the results from the Niatous, Mattawamkeag and Pleasant (Oakfield II) Lake intercept surveys as well as the Highland, Saddleback and Spruce Mountain surveys (Table 9). The Bingham survey results for the proportion of respondents who indicated the wind farm will have a negative effect on their experiences (32%) is similar to the proportions reported for Mattawamkeag Lake, Niatous Lake, Saddleback Ridge and Spruce Mountain. The Bingham survey results for those who are likely to return or the Project had no impact on their likelihood to return (80%) are similar to Mattawamkeag, Pleasant Lake and Saponac Pond. Thus, the impact of observing the Bingham Project is not that different from what has been observed in a number of other *ex ante* surveys of recreational users near wind farm sites in Maine.

The presence of existing projects in the Maine landscape also provides an opportunity to understand the impact of wind turbines on use and enjoyment of lakes and other resources. A 2010 study entitled “Baskahegan Stream Watershed Recreation Use & Resource Analysis,” conducted by Andrea Ednie, Ph.D. of the University of Maine at Machias (and Chad Everett, a student at UMM and John Daigle, Ph.D. at the University of Maine) provides evidence that visibility of turbines on a lake that receives relatively high recreational use has not had any impact, let alone an adverse impact, on the public’s continued use and enjoyment of that lake. Not a single person interviewed mentioned the presence of the turbines in the viewshed, and no one cited the wind project as a factor in their enjoyment, or as a detriment to the scenic and recreational qualities of the lake. By contrast, residential development was perceived much more negatively.

²³ Surveys often times are self-selecting because only people with an interest in responding do so. Additionally, due to typically limited samplings, the results may not be statistically significant or necessarily reflective of broader trends. With that cautionary note, we believe the surveys done for this Project and others, while not statistically significant due to the low number of persons surveyed, nonetheless provide helpful insights, particularly when considered with other surveys that are statistically significant.

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More recently, Kleinschmidt conducted a study²⁴ on Baskahegan Lake to learn if recreational visitation to and enjoyment of Baskahegan Lake are influenced by the presence of the Stetson wind project. This study is especially significant and relevant because it is the first post-construction survey conducted in Maine. As such, it evaluates *actual* perception and impact of turbine visibility on recreational users rather than *anticipated* impacts. Moreover, its conclusions are consistent with the Searsburg post-construction study discussed below. The survey found that the wind farm has no effect or a positive effect on scenic value (81%); the wind farm has no effect or a positive effect on the quality of their experience (93%); and, the wind farm has no effect on their likelihood to return (93%). Therefore, the Baskahegan Survey demonstrates that visibility of a wind farm on a scenic lake does not substantially diminish recreational users' enjoyment of the lake or their rating of the scenic quality of the lake.

²⁴ Baskahegan Lake Users Study by Kleinschmidt, September 2012

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Table 9. Comparison of Results of User Surveys at Proposed Wind Projects in Maine²⁵

Wind Project	Passadumkeag Project						Oakfield Project					
	Bingham*	Bowers†	Lower Pistol Lake	Saponac Pond	Nicatous Lake	Matta-wamkeag	Pleasant Lake	Bull Hill	Highland Wind	Highland Wind	Saddleback Ridge	Spruce Mountain
Date	September 2012	Summer 2012	Aug/Sept 2011	Aug/Sept 2011	Aug/Sept 2011	Aug/Sept 2011	Aug/Sept 2011	October 2010	August 2010	Summer/Fall 2010	September 2010	May 2010
Methodology	Intercepts	Intercepts	Intercepts	Intercepts	Intercepts	Intercepts	Intercepts	Intercepts	Web	Intercepts	Intercepts	Intercepts
Sample Size	23	70	29	29	29	20	40	81	304	58	22	15
Impact of seeing wind farms on enjoyment												
Positive	23%	19%	0%	0%	20%	23%	20%	9%	21%	8%	23%	20%
Neutral	45%	36%	62%	59%	48%	43%	42%	45%	61%	73%	45%	47%
Negative	32%	44%	37%	41%	31%	34%	37%	47%	18%	19%	32%	27%
Refused to Respond	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
Likelihood of returning if respondent saw wind farms												
Likely	30%	61%	0%	0%	7%	13%	13%	6%	15%	14%	27%	13%
No Change	50%	19%	78%	73%	81%	58%	60%	75%	68%	73%	50%	73%
Unlikely	20%	21%	22%	28%	11%	28%	27%	20%	17%	14%	23%	7%
Refused to Respond	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%

*Combined results of two lakes surveyed.

†Combined results of three lakes surveyed.

²⁵ Table is excerpted from "Expert Report of Kevin J. Boyle, PhD. Assessment of the Kleinschmidt Bowers Mountain Wind-Farm and Baskahegan Lake Studies," October 1, 2012

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The pre-filed testimony to the Vermont Public Service Board submitted by Todd Comen²⁶, an Associate Professor of Hospitality and Tourism Management at Johnson State College in Johnson, Vermont, and Managing Director of the Institute for Integrated Rural Tourism, draws conclusions from a number of studies regarding wind power impacts on tourism as well as original research conducted among visitors to the Northeast Kingdom of Vermont and the area near the Searsburg wind power project in southern Vermont. Comen concludes, based in part on interviews with local tourism industry representatives, that wind energy development can actually be a positive element for tourism.

In his testimony, Comen references James Palmer's Searsburg Study,²⁷ which concluded that after the Searsburg wind power project was built, project opponents' views all became more positive, and most improved substantially (p. 51). One year after the project had been in operation, 89% of respondents to a survey sent to Searsburg residents were either supportive or very supportive of the project. 80% of respondents were either supportive or very supportive of the existing wind power project doubling in size by adding 11 new turbines (p. 19). Initially, non-supporters had fearful expectations about the impacts of the turbines on wildlife, the noise they might produce, their conspicuous visibility, and likely unreliability. Over time, opponent's views moved to more neutral ratings, indicating that they are unsure whether there are any real disadvantages, or possible advantages (p. 51).

Todd Comen also conducted intercept surveys of tourists in the vicinity of the Searsburg Wind Project. He found that after the project was built in Southern Vermont, a major tourism destination in New England, 100% of the visitors interviewed "said that the wind farm did not deter them from visiting specific attractions in the area. 100% also said that additional wind towers would not deter them from visiting the Southern Vermont Region in the future." (p. 26) Additionally he interviewed the owners of 5 local businesses in the hospitality industry. "All of those interviewed observed no negative impact on their business and in fact were proud that the wind farm was located in their region of Vermont." (p. 23)

Several international studies have also been conducted in recent years concluding that tourists, including hikers, boaters, and other outdoor recreational enthusiasts, are either unaffected or positively affected by the presence of wind energy projects. All of these studies conclude that wind energy development in view of tourist destinations does not negatively impact tourism overall. For example, the 2008 study

²⁶ Prefiled Direct Testimony of Todd Comen on Behalf of the East Haven Windfarm, November 17, 2003, State of Vermont Public Service Board. Docket #7192.

²⁷ Public Acceptance Study of the Searsburg Wind Power Project: Year One Post-Construction, James F. Palmer, December 1997

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conducted in Scotland²⁸, in which 380 tourists were surveyed near operational wind power facilities, found that the vast majority (93-99%) of tourists that had seen a wind farm in the local area suggested that the experience would not have any effect on their decision to return to that area, or to Scotland as a whole (Section 4.3: Survey Results). Approximately 25% of those surveyed were engaging in wilderness-related outdoor activities like hiking and wildlife watching. The conclusions included the following:

- Only 4% of tourists who have viewed a nearby wind farm indicated that the turbines affect their intention of returning to the area (2% said it would increase the likelihood of return and 2% said it would decrease the likelihood of return);
- 72% of visitors were either positive or neutral about the statement "I like to see wind farms";
- Among hikers, for whom landscape was expected to be a major factor, only 19% indicated a negative attitude toward wind farms, whereas 25% of all respondents indicated a negative attitude; 45% of hikers indicated a positive attitude toward wind farms, while only 39% of all respondents held a positive view; and
- Respondents that had seen a wind farm were less opposed to wind power development than those who had not seen a wind farm.

Part 3 of the 2008 Scottish report includes a comprehensive literature review of other European studies and surveys on the impact of wind farms on tourism. The authors summarized 15 different studies that addressed visitors' return likelihood, including six from England, five from Scotland, two from Wales, one from Germany, and one from Denmark. Of these, five studies are based on revealed likelihood of returning and ten are based on stated likelihood. Based on this literature review, the report concludes:

- None of the five studies based on revealed behaviors found turbines to have an effect on visitors' likelihood of returning;
- Of the ten studies based on stated likelihood, seven found that wind turbines would negatively impact the likelihood of returning for less than 6% of respondents;
- The remaining three surveys found negative effects for 32%, 25%, and 70% of respondents, though the authors questioned the reliability of these surveys based on methodological concerns; and
- Overall, the authors conclude that while residents sometimes believe wind farms will have a negative impact on tourism, there is no significant evidence that turbines discourage visitors from returning.

²⁸ Economic Research Findings: The Economic Impacts of Wind Farms on Scottish Tourism, The Scottish Government, March 2008

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In 2011, VisitScotland²⁹ released a report summarizing results from two surveys on consumer attitudes about wind farms, one in the UK with 2,000 respondents and the other in Scotland with 1,000 respondents. The surveys included only people who had taken a holiday or short break in the UK in the past year, and who intended to do so again. The report concludes that the majority of respondents (80 and 81.3%) do not find wind farms offensive. Similarly, the majority (82 and 83%) would not change their travel patterns to avoid areas with wind farms. Roughly a quarter (24%) of respondents believe that “using wind farms in the promotion to tourists would provide an added appeal to visitors.”

A 2008 Prince Edward Island study,³⁰ which used surveys from 1,676 people, of which 1,313 were tourists, included findings with regard to the visual impacts of several operational wind energy facilities on a region that is proximate and similar to Maine:

- With respect to the statement “wind farms ruin the view in the areas they are located,” 63% of respondents disagreed or strongly disagreed, while only 5% of respondents strongly agreed;
- While only 44% of both residents and visitors either agreed or strongly agreed that a wind farm adds to the attractiveness of the area where it is located, about 81% of both residents and visitors either disagreed or strongly disagreed that wind farms are a poor use of PEI’s land base; and,
- 71% of resident respondents either agreed or strongly agreed that wind farms are an attraction for visitors to PEI.

A recent peer-reviewed study conducted in two rural areas of the Czech Republic that host nature-based recreational activities such as hiking, camping and fishing, catalogued the views of 156 tourists and 73 business owners to determine the impact of wind power development on tourism.³¹ The study found that over 90% of tourists said that the presence of turbines did not influence their choice of destination, and only 6% of tourists stated that they would not visit an area where turbines are located. (pg. 510) In addition, the study revealed that tourists were much more likely to view turbines favorably than were local residents. (pg. 512)

Collectively, this literature provides evidence that wind energy development is gaining support and that the consequent visual impacts of wind are not always

²⁹ <http://www.visitscotland.org/default.aspx?page=2371>

³⁰ Wind Energy Report: Views of Residents of PEI and Visitors to PEI, Tourism Research Centre at University of PEI School of Business, September 4, 2008

³¹ Wind Turbines in Tourism Landscapes, Frantal and Kunc, *Annals of Tourism Research*, Vol. 38, No. 2, at 499-519 (April 2011)

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necessarily negative or adverse. Only about 33% of all respondents to surveys conducted for proposed wind projects in Maine (Table X) were negatively impacted, and roughly 20% of all respondents were unlikely to return. However, the majority of users (67%) are either neutral or positively effected by wind power projects, and 80% will return. The Baskahegan survey found that the wind farm has no effect or a positive effect on scenic value (81%); the wind farm has no effect or a positive effect on the quality of their experience (93%); and, the wind farm has no effect on their likelihood to return (93%). For surveys conducted outside of Maine, there are similar results, where the majority of people are affected somewhat by turbines in view, but not so much that their enjoyment is adversely effected or that they are unlikely to return. The similar results for all of these surveys and literature suggest that wind power projects have a minimal effect on continued use and enjoyment, therefore the rating for this indicator is assumed to be Low for all resources.

Table 10. Overall Rating – Project’s Effect on Continued Use and Enjoyment of the Scenic Resource

Resource	Scenic Change	Effect on enjoyment	Effect on continued use	Other surveys	Overall Rating
Arnold Trail	Low	Low	Low	Low	Low
Bald Mountain Pond	Low	Low	Low	Low	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	Low	Low-Medium	Low	Low	Low
Kennebec River downstream of Wyman Dam	Low	Low	Low	Low	Low
Punchbowl Pond	Low	Low	Low	Low	Low

F. Scope and Scale of Visibility from the Scenic Resource - The assessment of this criterion is based primarily on desktop analysis of project visibility using a variety of tools (e.g. viewshed analysis, visual simulations, spatial analysis), in concert with field observations and professional expertise. Visibility in the landscape does not automatically translate to an adverse or high scenic impact. This analysis helps reveal both the qualitative nature of the project and the quantitative aspect of potential project visibility. This analysis is based on the following indicators:

- (1) **The number of turbines visible.** This category accounts for the number of turbines (hub and above) visible. We have adopted James Palmer’s methodology for determining thresholds for significance³². We consider this rating breakdown to be a

³² From Review of the Bowers Wind Project Visual Impact Assessment, Part 2: Independent Analysis, March 8, 2013, p. 35. We did not adopt the 10th percentile threshold for determining number of turbines visible because we found that it skewed the results to be inaccurate. Using the 10th percentile threshold results in a potential visibility of 0 turbines at Bald Mountain Pond and both locations on the Kennebec River, as the 10th percentile threshold is not met. However, our visual simulations confirm that some turbines are indeed potentially visible from these locations.

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reasonable, objective standard for visible turbine thresholds. However, it does not account for other perceptual factors associated with the scale of the project in relation to the landscape, which is factored into our analysis under other indicators such as Angle of View and Visual Dominance. The thresholds are as follows:

1-15 turbine hubs = Low

16-30 turbine hubs = Medium

31+ turbine hubs = High

All of the resources with potential visibility received a rating of Low based on number of turbines potentially visible. It should be noted that in some instances the visual simulations, which reflect actual tree cover conditions and are therefore generally more accurate, indicate that the viewshed analysis noticeably overstates visibility, which uses 40-foot tree heights only for specific categories of tree cover (deciduous, coniferous and mixed forest cover). There are no instances on this project, however, where discrepancies between the viewshed analysis and the visual simulations resulted in different ratings for this indicator. A comparison of these results is included in Table 11 - Number of Turbines Visible and summarized here:

For Bald Mountain Pond, our visual simulation confirms the potential visibility of three turbines. For the Kennebec River upstream of Wyman Dam (Wyman Lake), our visual simulation confirms the potential visibility of 12 turbines, although four of these would be obscured by shoreline vegetation from the simulation vantage point. One would have to travel out onto the lake to see all 12 turbines. For the Kennebec River downstream of Wyman Dam, our visual simulation indicates that only four to five turbine hubs would potentially be visible, with blades of up to seven additional turbines potentially visible (the viewshed simulation indicates up to 10 potentially visible turbine hubs). The same would apply to the Arnold Trail. In the case of the Kennebec River and the Arnold Trail, the discrepancy between the viewshed analysis and the visual simulation can be explained by the fact that the intervening ridge in the simulation photo is classified as a land cover type that does not qualify for inclusion in the viewshed analysis. The same is true for Punchbowl Pond, and even the modified viewshed analysis³³ overstates potential turbine visibility because shoreline trees are much taller in reality (65' field-verified) than what was used in the model (40'). While the viewshed analysis suggests that up to 8 turbines could be visible, our visual simulation suggests that no turbines would be visible above the tall shoreline trees, while up to five turbine hubs might be visible through narrow breaks in the shoreline vegetation. From the vantage point of highest visibility on the northern shore, our 3D model suggests that up to eight turbines could potentially be visible through breaks in the shoreline trees, although it is unlikely that any of them would be above the tops of the trees based on the recorded tree heights. These potentially

³³ This analysis is based on a modified viewshed analysis that accounts for shoreline vegetation (assumed height 40' for model).

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visible turbine hubs/blades could be very difficult to discern amongst the shoreline trees and could be easily overlooked, even from the vantage point with the highest potential visibility, and it is unlikely that all of them would be visible at the same time.

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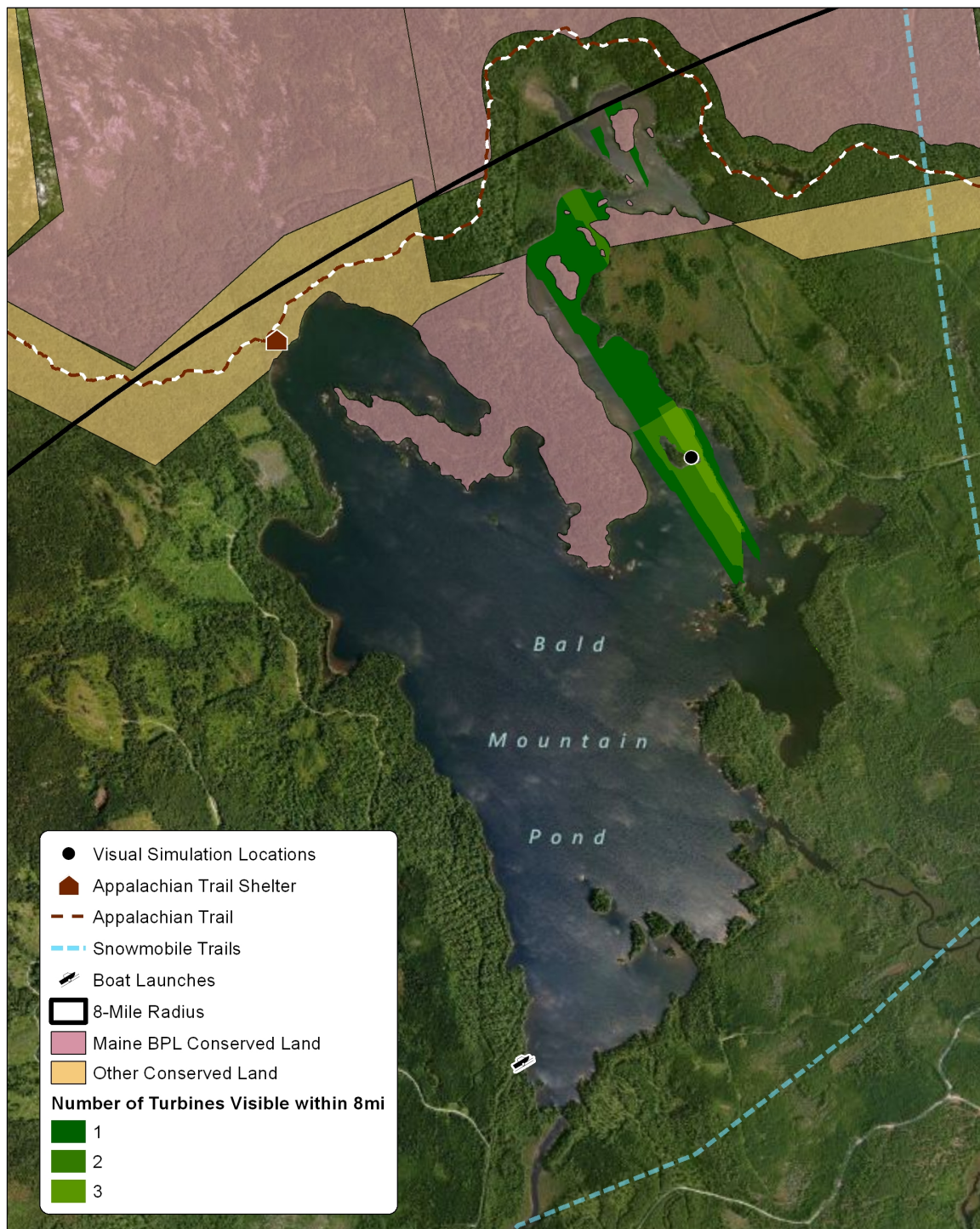


Diagram 5. Bald Mountain Pond Visibility and Environs

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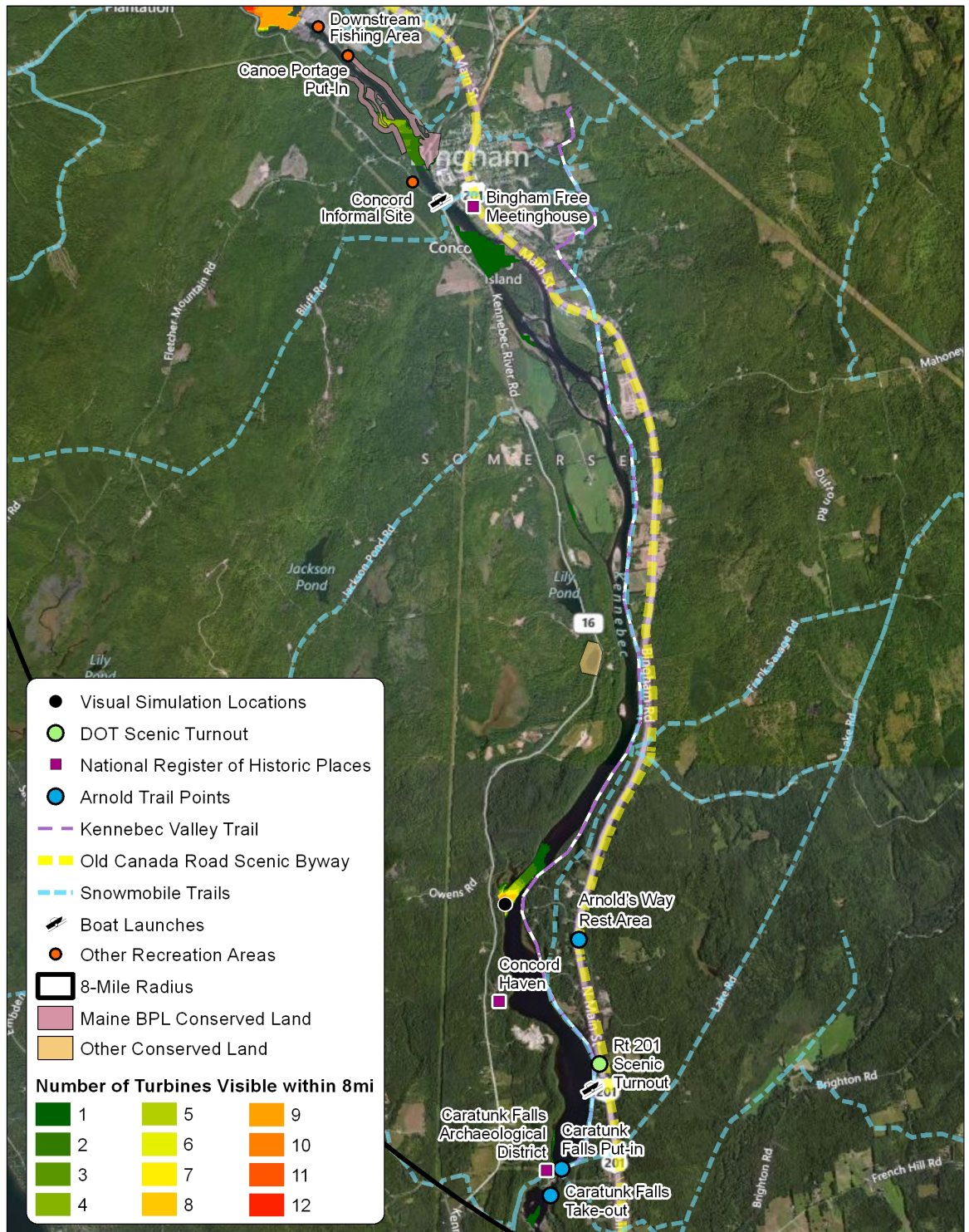


Diagram 6. Kennebec River Visibility and Environs

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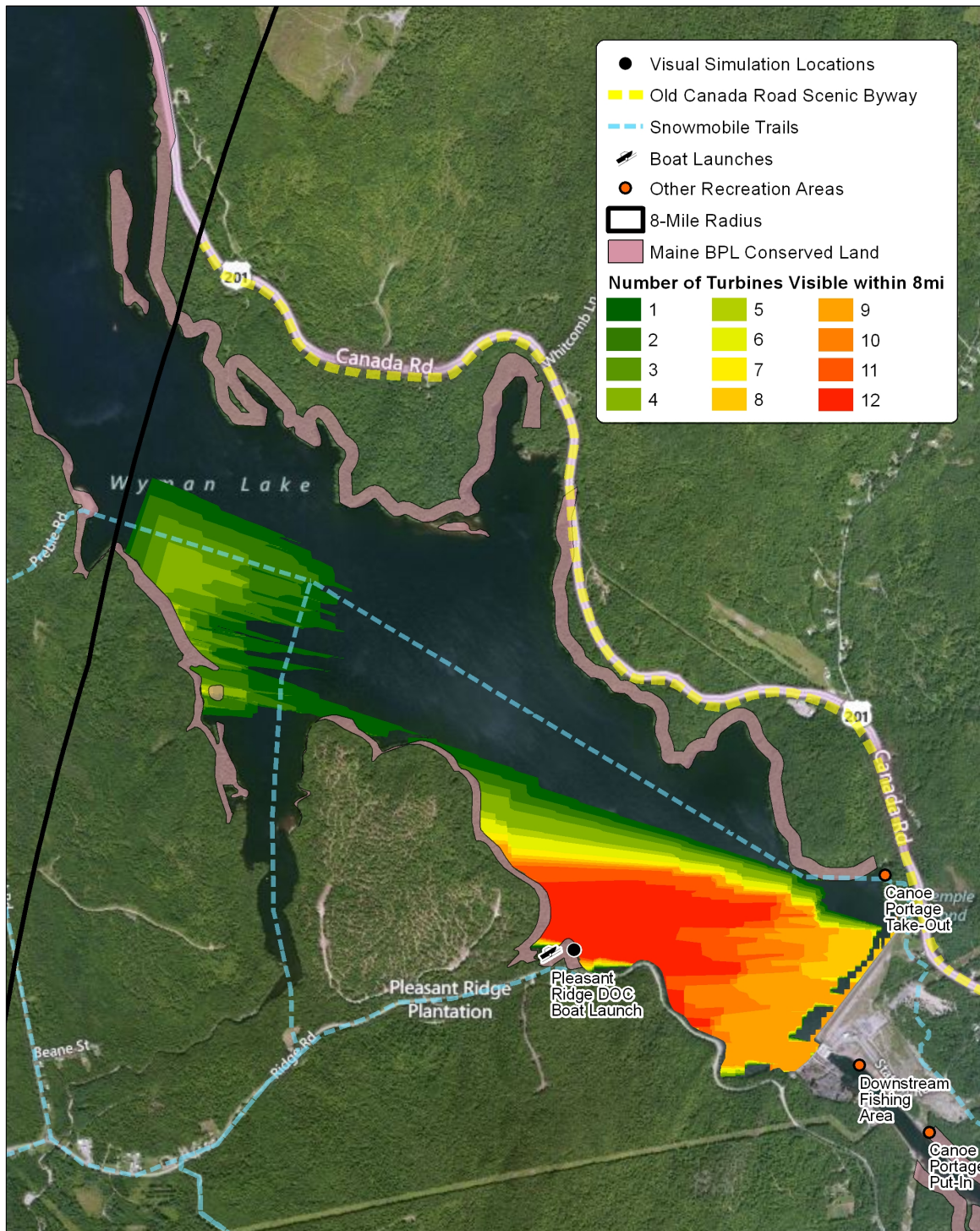


Diagram 7. Wyman Lake Visibility and Environs

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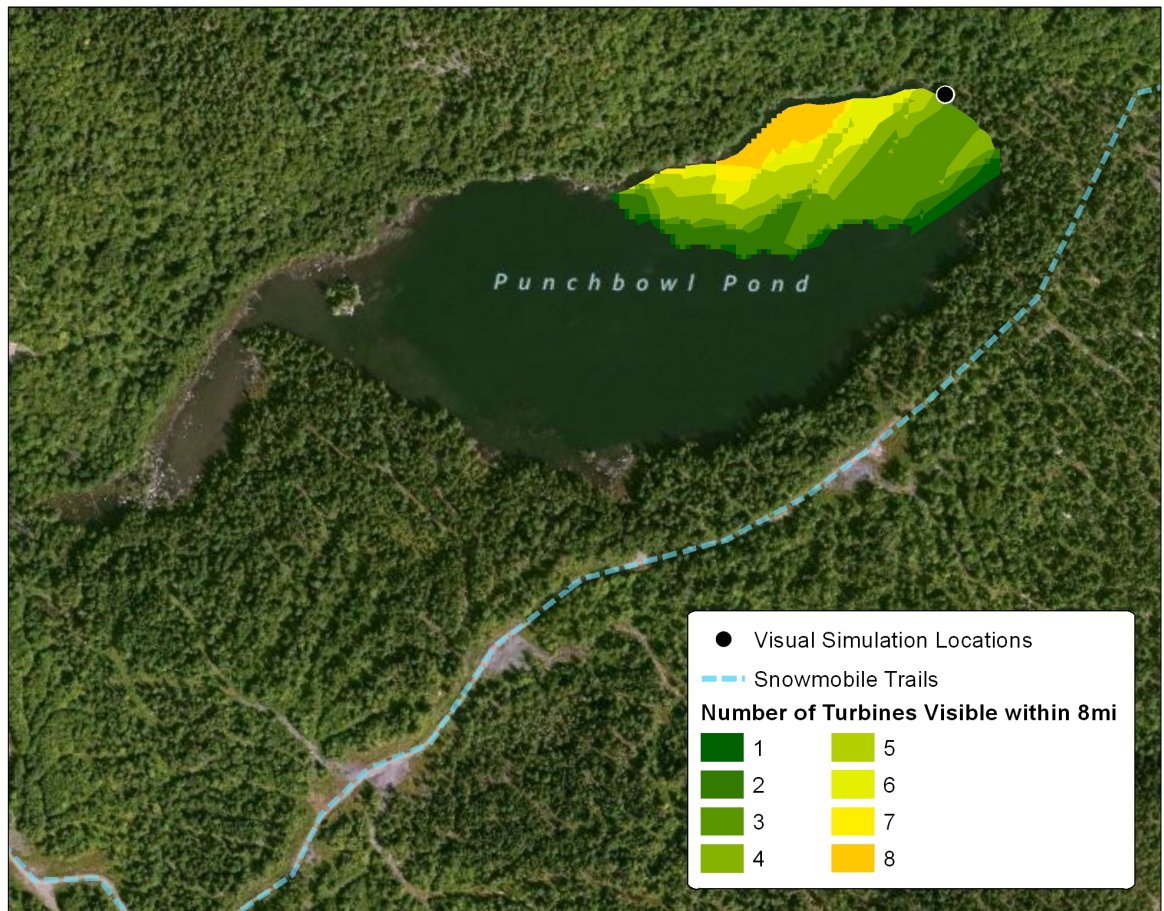


Diagram 8. Punchbowl Pond Visibility and Environs - This viewshed analysis accounts for the shoreline vegetation (40’ tall assumed height for model, 65’ tall field-measured) along the southern shore, which dramatically reduces project visibility.

Table 11. Number of Turbines Visible

Resource	The number of turbine hubs potentially visible (based on viewshed analysis)	The number of turbine hubs potentially visible (based on visual simulation)	Rating
Arnold Trail	10	5	Low
Bald Mountain Pond	3	3	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	12	12	Low
Kennebec River downstream of Wyman Dam	10	5	Low
Punchbowl Pond	8	5-8	Low

(2) **Percent of SRSNS with visibility of turbines.** This category accounts for the percent of a SRSNS with potential visibility of at least one turbine hub. We have

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adopted James Palmer's thresholds for this indicator (simple breakdown into thirds.³⁴)

The thresholds are as follows:

1-33% = Low

34-66% = Medium

67%+ = High

All of the resources with potential visibility received a rating of Low based on percentage of the resource with potential visibility of turbine hubs, with the exception of Wyman Lake. This assessment is based on our viewshed analysis, using 40-foot tree heights only for specific categories of tree cover (deciduous, coniferous and mixed forest cover only). However, these base assumptions sometimes result in different findings when compared to our visual simulations. Of these resources with potential visibility, the ratings would remain the same when considering the results of the visual simulations, with the exception of Punchbowl Pond, whose visibility is dramatically overstated in the viewshed analysis (see description of visibility for previous indicator). In order to address this discrepancy, we produced a modified viewshed analysis that includes the land use classification "light partial cut," which is the land cover type designated along much of the southern shoreline of Punchbowl Pond. Based on this modified viewshed analysis, which is still conservative because it does not include the field-measured 65' tall shoreline vegetation, Punchbowl Pond would actually receive a rating of Low. This analysis confirms that vegetation plays a critical role in determining visibility, and that it can dramatically impact visibility. The image above presents a better representation of what might potentially be visible from this resource. Again, the simulation suggests that the shoreline vegetation is actually much taller than 40', and a viewshed analysis using the actual tree heights could likely result in zero visibility on Punchbowl Pond, as no turbines would be potentially visible above the shoreline trees. Our rating of Low for Punchbowl Pond reflects the results of the revised viewshed analysis.

For some of the resources, the areas with potential visibility do not represent areas that would get much use. For Bald Mountain Pond, the northern area of the pond with potential visibility is difficult to navigate because the water is shallow and strewn with boulders, thus limiting motor boating activities. The boat launch, which is located in the southeastern corner of the pond, and the A.T. shelter at the northeast end of the pond, would not have visibility. Many people motor boating will likely recreate in the southern and central portions of Bald Mountain Pond, where there is no visibility, due to these factors. For Punchbowl Pond, it is unlikely that many people would visit the part of the lake with highest visibility because dense evergreen

³⁴ From Review of the Bowers Wind Project Visual Impact Assessment, Part 2: Independent Analysis, March 8, 2013, p. 37.

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vegetation that overhangs the shore makes access difficult. Paddling is not expected to be a common activity on this pond due to the long walk required from the parking area. The camping area is located on the southern shore where there is no visibility, and the majority of fishing likely occurs closer to this main access point, again due to difficulty of shoreline access on the northern shore.

Table 12. Percent of SRSNS with visibility of turbines

Resource	% w/ Visibility (Based on Viewshed Analysis)	Rating
Arnold Trail	8.6	Low
Bald Mountain Pond	10.8	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	53.9	Medium
Kennebec River downstream of Wyman Dam	8.6	Low
Punchbowl Pond	19.4 ³⁵	Low

(3) **Proximity or distance of turbines.** Aesthetic experts agree that the visual impact of wind turbines diminishes over distance. The *National Forest's Handbook on Scenery Management* also sets forth the use of distance zones and indicates that with increased distance the “concern” level for visual impact or impacts to overall scenic integrity lessens. The ability of particular weather and lighting conditions to soften the visual presence of turbines also increases with distance. In fact, white turbines set against a white sky background can be almost impossible to distinguish when viewed at greater distances. As such, the use of distance zones is applied to this Visual Impact Assessment as one indicator for helping to determine the impact of the Project's visibility. For a given SRSNS we categorize the resource by distance zone based on the nearest potentially visible turbine. This analysis has defined the following zones/ratings, which are derived in part by the work of the Forest Service, but have been refined based on our own experience with wind projects:

- **High: 0 to 2 miles**
Turbines may appear very large and can dominate the view at this distance range.
- **Medium: 2 to 6 miles**
Turbines diminish in scale over this four-mile span, but they still have the potential to dominate a view depending on other factors.
- **Low: 6 to 8 miles**
At this distance range turbines are far less likely to dominate a view due to their apparent visual scale. At the 8-mile mark, the visual impact of turbines is considered insignificant by the Maine legislature.

³⁵ This analysis is based on a modified viewshed analysis that accounts for shoreline vegetation (assumed height 40' for model).

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All of the resources with potential visibility received a rating of Medium based on the distance of the turbines, with the exception of Bald Mountain Pond, which received a rating of Low.

Table 13. Proximity or distance of turbines

Resource	Closest Visible Turbine	Rating
Arnold Trail	3.9 miles	Medium
Bald Mountain Pond	6.8 miles	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	5.6 miles	Medium
Kennebec River downstream of Wyman Dam	3.9 miles	Medium
Punchbowl Pond	4.2 miles	Medium

(4) **Angle of view.** A turbine array that occupies a narrow angle of view typically has less visual impact than one that occupies a wide angle of view. Numerous factors can affect the angle of view from a given vantage point, including number of visible turbines, distance, and location of viewer in relation to the turbine array alignment (i.e. broad view vs. head-on view down a line of turbines). The angle of view typically gets larger when getting closer to a project (see Diagram 9 below). When observing a project on hilly terrain, however, the angle of view from a closer vantage point can sometimes be reduced as some turbines become obscured by intervening topography and/or vegetation.

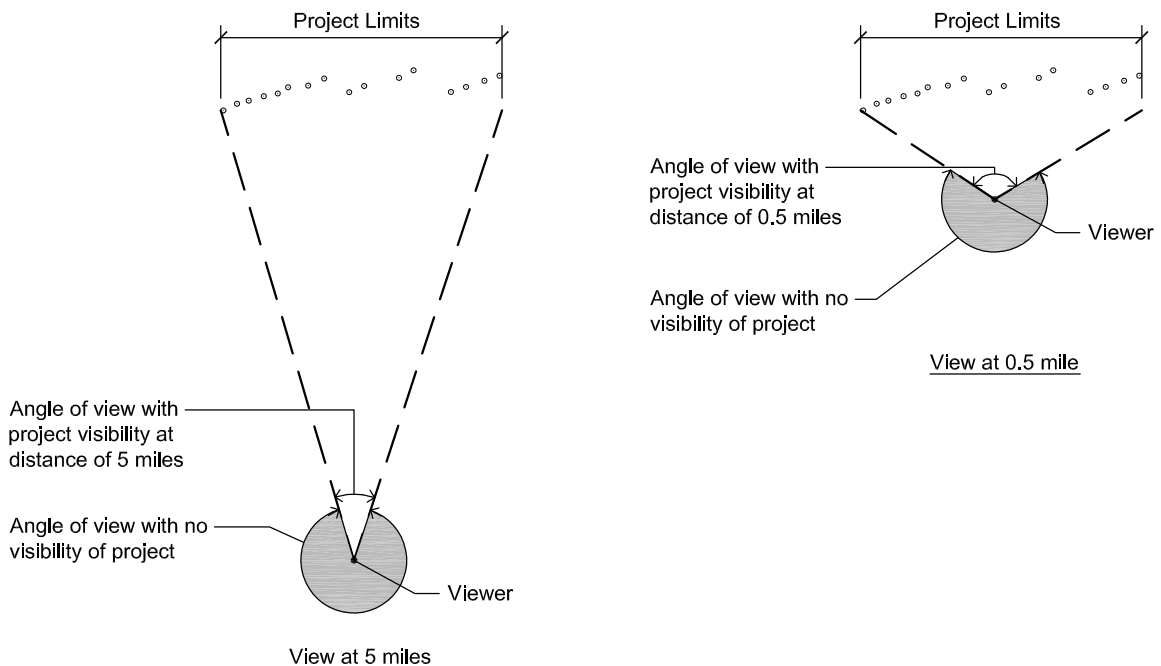


Diagram 9. Effect of Distance on View Angle

The human field of view for stereoscopic vision is approximately 120 degrees, while our peripheral vision extends to approximately 180 degrees. The central field of

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view occurs within 40-60 degrees and is the area that most highly influences human perception of a scene, given a fixed viewing direction. The simulations prepared for this report depict this central angle/field of view. Vantage points within open areas such as lakes typically allow for 360-degree views, and in such cases a proposed project may occupy a limited portion of this overall view. We propose the following ratings as a means of assessing the contribution of angle of view to scenic impact. (See Exhibit 14: Angle of View Thresholds: 180° Total Possible View and Exhibit 15: Angle of View Thresholds: 360° Total Possible View.) Note that the percentage is calculated based on the angle of view encompassing visible turbine hubs divided by the total possible view angle from a given resource (e.g. for a lake 360 degree views would be possible, while a scenic pull-off with a fixed view would potentially have a total possible view of 180 degrees or less, depending on site conditions):

- **High: 21%+**
Turbines take up a substantial percentage of the total possible field of view and have the potential to dominate a fixed view toward the project site.
- **Medium: 7% to 21%**
Turbines take up a moderate percentage of the total possible field of view and have the potential to occupy a significant portion of a fixed view toward the project site.
- **Low: 0% to 7%**
Turbines take up a small percentage of the total possible field of view and have the potential to impact only a minor portion of a fixed view toward the project site.

All of the resources with potential visibility received a rating of Low based on the angle of view of potentially visible turbine hubs as a percentage of the total possible field of view.

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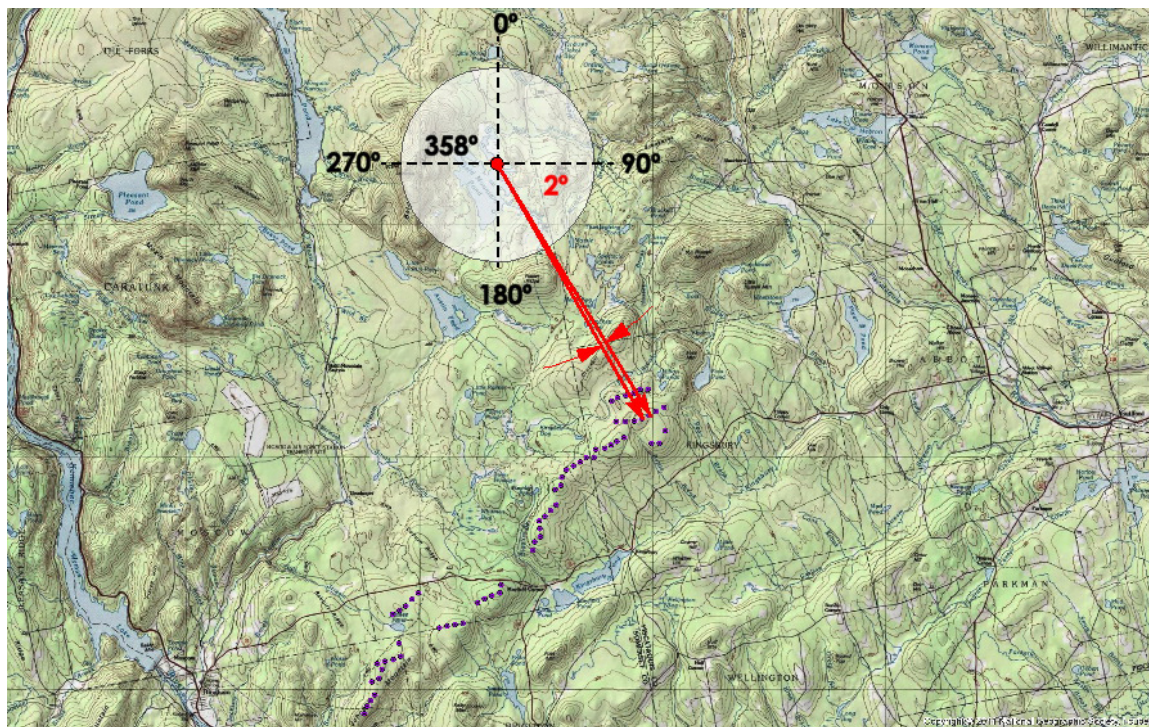


Diagram 10. Bald Mountain Pond Angle of View from Simulation Viewpoint

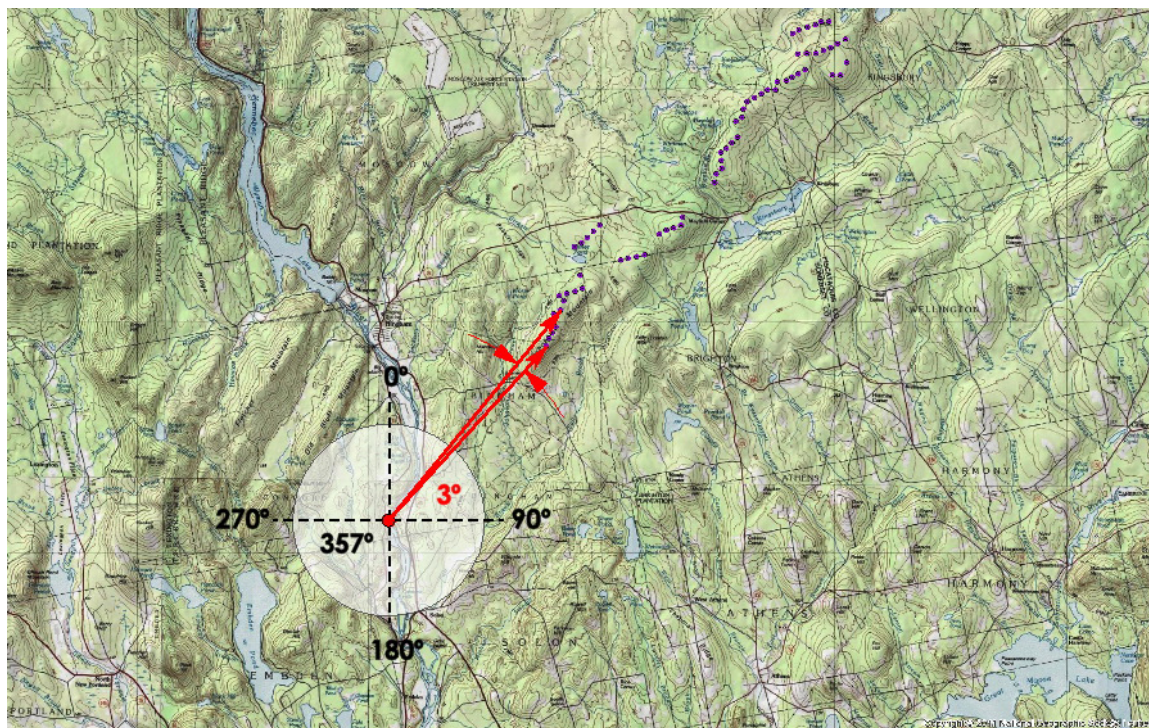


Diagram 11. Kennebec River downstream of Wyman Dam Angle of View from Simulation Viewpoint

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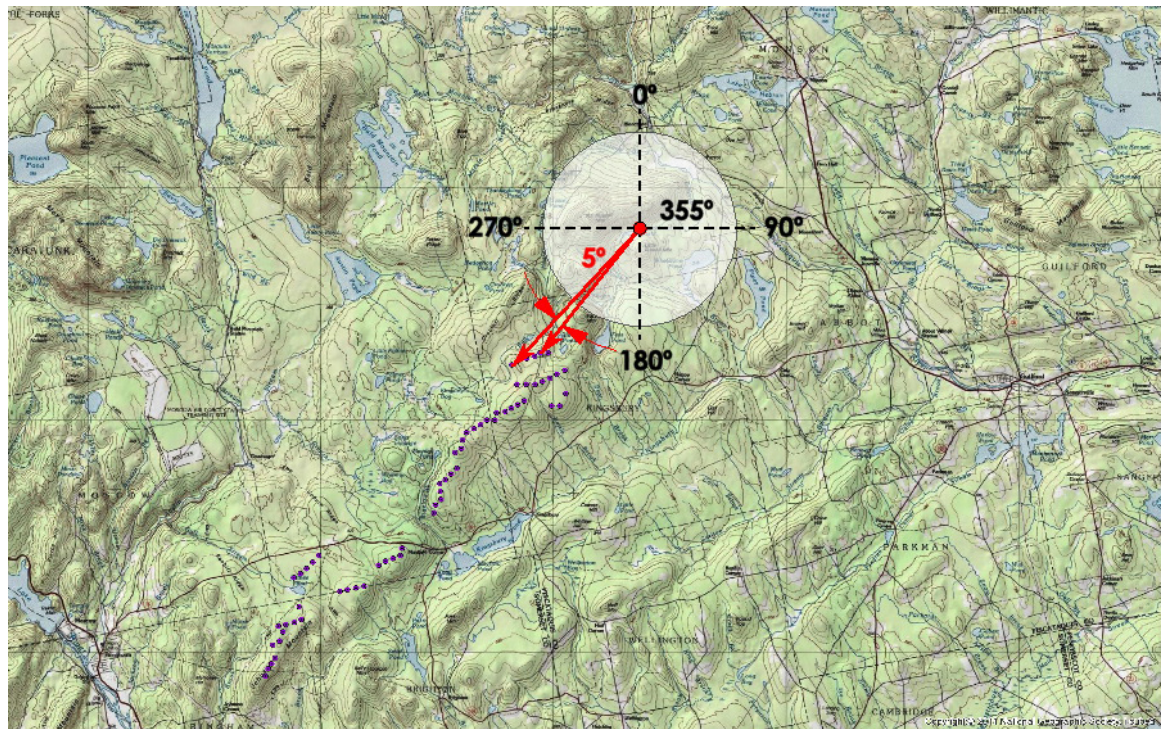


Diagram 12. Punchbowl Pond Angle of View from Simulation Viewpoint

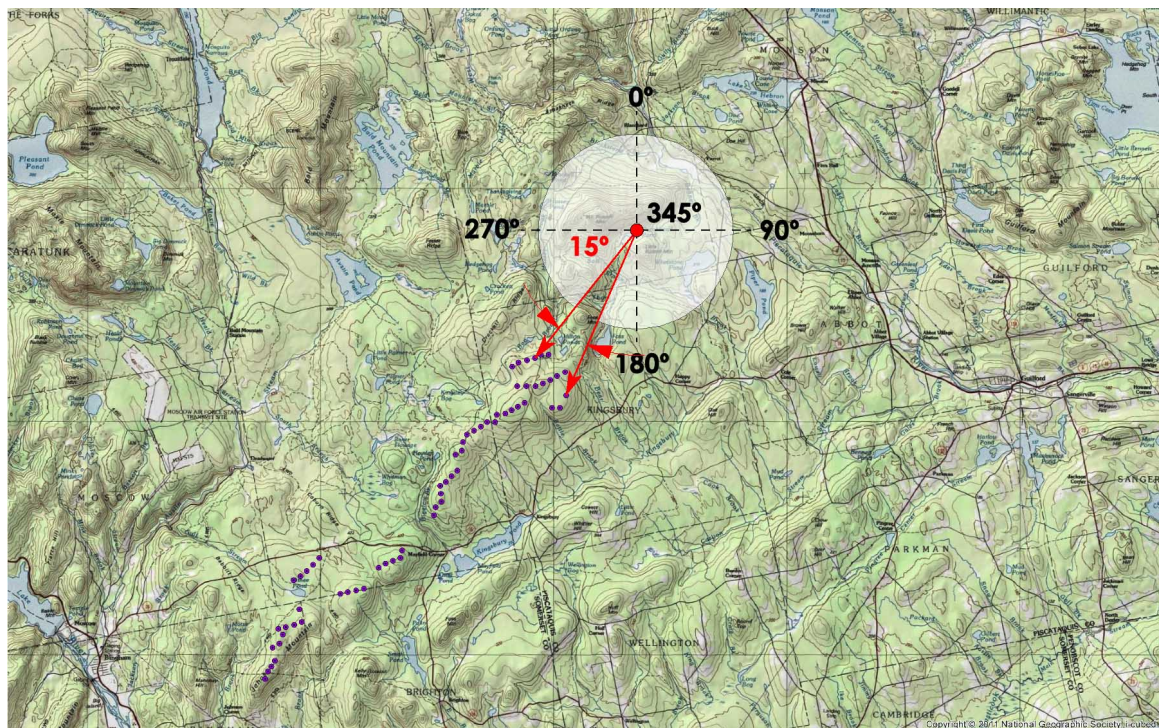


Diagram 13. Punchbowl Pond Angle of View from an area just west of the Simulation Viewpoint³⁶

³⁶ This Angle of View study was conducted for a viewer location in the area with the highest number of potentially visible turbines according to the viewshed analysis. Our visual simulation and field observations suggest that the eight

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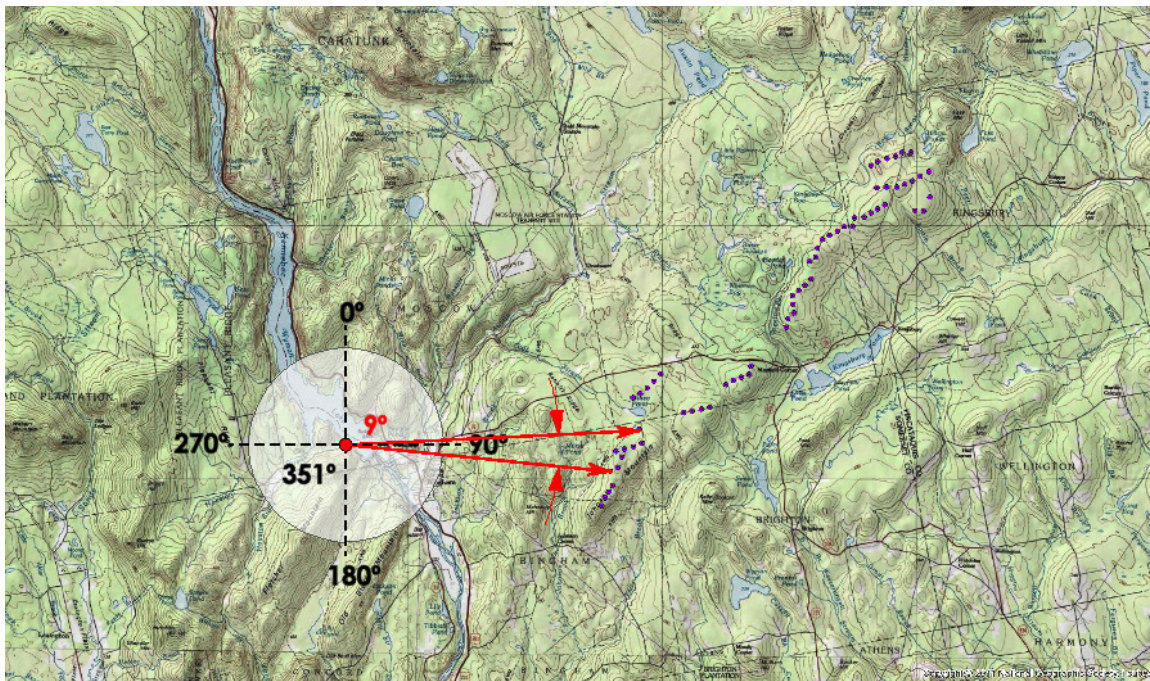


Diagram 14. Wyman Lake Boat Launch Angle of View from Simulation Viewpoint

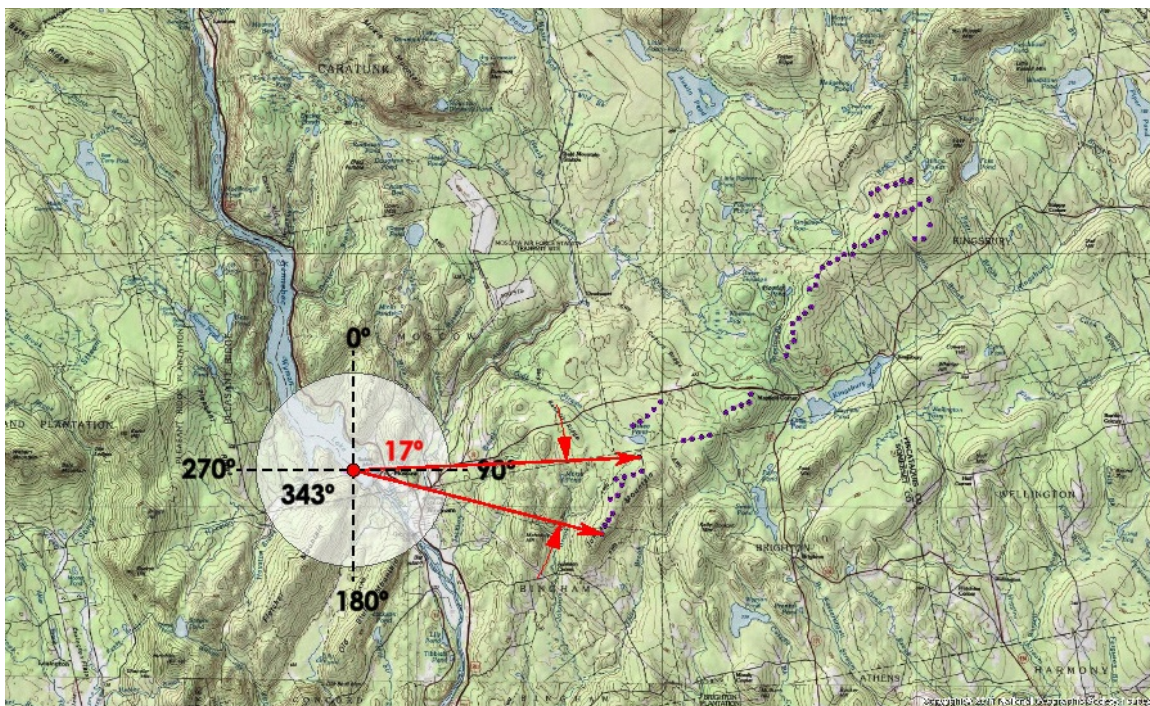


Diagram 15. Wyman Lake Offshore Angle of View³⁷

potentially visible turbines that make up this angle of view would not in actuality be visible at the same time due to tall shoreline vegetation, whereas portions of individual turbines could be visible between gaps in trees, dependent on viewer position.

³⁷ This Angle of View study was conducted for a viewer location in the area with the highest number of potentially visible turbines according to the viewshed analysis.

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Table 14. % of total possible view

Resource	% of total possible view*	Rating
Arnold Trail	.8% (3° of 360° view)	Low
Bald Mountain Pond	.6% (2° of 360° view)	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	4.7% (17° of 360° view)	Low
Kennebec River downstream of Wyman Dam	.8% (3° of 360° view)	Low
Punchbowl Pond	4.3% (15° of 360° view) ³⁸	Low

*Note: For all of these resources, we assume a 360-degree total possible view given that the viewer is on a water body with no fixed view direction. It should be noted, however, that paddlers on the Kennebec River (downstream of Wyman Dam) would generally be facing downstream, away from the project.

(5) **Visual dominance.** This indicator considers the scale of the project in relation to the vantage point and the project surroundings. Do the turbines command the attention of the viewer away from all other aspects of the landscape? Are there other ridges without turbines visible from a give resource? Are the turbines in the center of an important view, and/or in close visual association with an important natural or cultural focal point? In addition to these factors, the height of the turbines in relation to the height and mass of the landforms below them affects visual dominance; Turbines located on very tall ridges can have an elevated prominence in landscape, and therefore have the potential to be visually dominant. Likewise, turbines that that appear taller than the ridges below them have the potential to be visually dominant by overwhelming the landscape in their scale. Projects that are sited and scaled appropriately for the landscape, however, minimize the potential for this effect. Intervening topography and vegetation can often obscure all or portions of turbine towers, thereby reducing their prominence on a ridge. The potential for this effect is related to the landscape's visual absorption capability (VAC), which is another factor we consider when determining a project's potential for visual dominance. Visual absorption capability was a concept originally developed by the U.S. Forest Service as a tool to assess a landscape's susceptibility to visual change caused by man's activities. In other words, it is a measure of a land's ability to absorb alteration, yet retain its visual integrity. A landscape defined by numerous rolling hills is more able to visually absorb a wind project than one that is located on a sole hill surrounded by a flat landscape. Landscape Aesthetics: A Handbook for Scenery Management, a key reference document in the field of aesthetic assessment, lists a number of factors affecting VAC, including:

- Variety or diversity of landscape pattern- particularly the amount and extent

³⁸ Our visual simulation and field observations suggest that the eight potentially visible turbines that make up this angle of view would not in actuality be visible at the same time due to tall shoreline vegetation, whereas portions of individual turbines could be visible between gaps in trees, dependent on viewer position.

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- provided by landform, rockform, waterform, or vegetative cover-affects visual absorption capability.
- Tall vegetation, such as trees, screen and break up the visual continuity of landscape alteration. Short vegetation, such as grasses and low shrubs, does not.
 - Heavily patterned and diverse, dense vegetative cover, especially if mixed with waterforms like lakes, rivers or streams, break up the perceived continuity of landscape alterations. Homogeneous vegetative cover and lack of waterforms does not.



Diagram 16. Example of landscape with LOW visual absorption capability: Big Spencer Mountain as seen from Lazy Tom Bog in Kokadjo, Maine, is a prominent feature in the landscape surrounded by relatively flat bog land and patches of woodland, with minimal topography and tree cover to limit views in the surrounding area.

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Diagram 17. Example of landscape with MODERATE to HIGH visual absorption capability: The topographical diversity and variety of visual elements around Wyman Lake, combined with a predominantly wooded landscape, lessens potential project visibility and focuses viewers' interest in a number of directions.

An example of a project with High visual dominance would be one in which the scale of the project appears to overwhelm the landscape in its scale, potentially due to a number of factors, including the landscape's visual absorption capability, the location of the project on an important natural focal point, etc. An example of a project with Low visual dominance would be one in which the project has a minimal impact on the landscape's visual integrity, potentially due to a high percentage of turbine towers being obscured by intervening topography/vegetation and the presence of more distinctive peaks competing for viewer attention. A project with Medium visual dominance might be located within a landscape of moderate visual absorption capability, resulting in a moderate potential compromise of the landscape's visual integrity.

All of the resources with potential visibility received a rating of Low for this indicator. For the Kennebec River (and Arnold Trail), the towers of this small cluster of turbines are largely obscured by the vegetation on the intervening ridge. Their visual weight is minor in the context of the overall landscape, which includes a diversity of visual features that increase its visual absorption capability. (See Exhibit 18: Visual Simulation from Kennebec River, Concord.) For Bald Mountain Pond, the hubs of three distant turbines are barely visible above a low point in an intervening ridgeline and would have a minor visual presence compared to the visually dominant landforms. (See Exhibit 16: Visual Simulation from Bald Mountain Pond.) For the Kennebec

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River upstream of Wyman Dam (Wyman Lake), the turbine towers are substantially blocked by an intervening ridge. Although up to a dozen turbines may be visible from portions of the lake, the landforms remain dominant in scale, and there are many elements in the surrounding landscape to draw the eye, including numerous peaks and the manmade form of the dam. (See Exhibit 17: Visual Simulation from Wyman Lake.) For Punchbowl Pond, turbine hubs would only be potentially visible in narrow gaps in the shoreline vegetation and therefore would likely blend in with the trees. In addition, the surrounding landforms would draw the eye and clearly be dominant in scale. (See Exhibit 18: Visual Simulation from Punchbowl Pond.)

Table 15. Visual dominance

Resource	Rating
Arnold Trail	Low
Bald Mountain Pond	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	Low
Kennebec River downstream of Wyman Dam	Low
Punchbowl Pond	Low

- (6) **Visual clutter/landscape coherence.** Clusters of turbines or structures of different designs can create a potentially discordant appearance and reduce the coherence of the landscape. Turbines spaced in a linear fashion at fairly regular intervals can be more aesthetically pleasing than turbines that overlap each other and appear jumbled. An example of a project/view that would receive a High rating would be one in which turbines are located on several ridges at varying distances to the viewer, viewed at an angle that results in a high degree of visual chaos due to their overlapping, jumbled appearance. An example of a project/view that would receive a Low rating would be one in which turbines are sited in a linear fashion, spaced at fairly regular intervals, viewed at a broad angle with minimal overlapping turbines. A project that would receive a Medium rating would be perceived as having moderately regular spacing with some clustering/overlap.

All of the resources with potential visibility received a rating of Low or Medium for this indicator. For the Kennebec River (and Arnold Trail), a few turbine rotors will overlap each other, which results in some compromise of the appearance of visual order and is just enough to warrant a rating of Medium. For Bald Mountain Pond, the three potentially visible turbines (within 8 miles) are not evenly spaced but the sense of visual clutter is minimal, resulting in a rating of Low. For the Kennebec River upstream of Wyman Dam (Wyman Lake), the clustering of the turbines is just enough to warrant a rating of Medium, although no overlap of rotors is apparent. For Punchbowl Pond, turbines are not sufficiently visible to produce any sense of order or disorder, so the rating is Low.

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Table 16. Visual clutter

Resource	Rating
Arnold Trail	Medium
Bald Mountain Pond	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	Medium
Kennebec River downstream of Wyman Dam	Medium
Punchbowl Pond	Low

When each of the indicators are considered collectively, the overall rating for every resource with potential visibility is Low, except for Wyman Lake which is Low-Medium, as shown in Table 17 that follows.

(7) Summary of Overall Visibility**a. Bald Mountain Pond**

For Bald Mountain Pond, only three turbines at 6.8 miles or more away, are potentially visible from a very small portion of the northern end of the pond. These turbines would take up a very narrow angle of view and appear quite small due to their distance. The majority of the turbine towers would be obscured by intervening ridges, and the visible portions would be dwarfed in scale by the surrounding landscape. In addition less than 11% of the pond would have potential visibility of any turbines. The northern area of the pond with potential visibility is difficult to navigate because the water is shallow and strewn with boulders, thus limiting motor boating activities. Turbines would not be visible from the boat launch, which is located in the southeastern corner of the pond, or from the A.T. shelter at the northeastern end of the pond. The access point location and water depth suggests that many people motor boating will likely recreate in the southern and central portions of Bald Mountain Pond, where there is no visibility.

b. Wyman Lake

For Wyman Lake, up to 12 turbines would be visible from a small portion of the lake (less than 10%.) Although approximately half of the lake within the eight-mile project radius would have some potential visibility, the nature of the view is such that the turbines would not dominate the landscape. The intervening ridge substantially blocks the majority of the turbine towers, thereby reducing their apparent heights significantly, and they are over five miles away. With 360° views on the lake, the angle of view of that these turbines take up within the total possible field of view is low. The landforms remain dominant in scale, and there are many elements in the surrounding landscape to draw the eye, including numerous peaks and the manmade form of the dam. There would be no visibility from the Pleasant Ridge boat launch- one would have to walk to the shore near the picnic area to see turbines, as depicted in the visual simulation. There is no potential visibility from the entire

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northern shoreline, and the deep cove west of Pleasant Ridge Plantation would have no views either.

c. Punchbowl Pond

For Punchbowl Pond, tall shoreline vegetation (65' field-measured heights) would significantly reduce potential visibility of the project, and the modified viewshed analysis (model utilizes 40' tree heights) indicates that less than 20% of the pond would have potential visibility. From the simulation location, only five turbines would potentially be visible through gaps in the shoreline trees, and these turbine hubs/blades could be very difficult to discern and could be easily overlooked (see Exhibit 19). From the vantage point of highest visibility on the northern shore, our 3D model suggests that up to eight turbines could potentially be visible through breaks in the shoreline trees, although it is unlikely that any of them would be above the tops of the trees based on the recorded tree heights. These potentially visible turbine hubs would take up a very narrow angle of view, and the nearest turbine is 4.2 miles away. With the turbines having such a minor visual presence amongst the trees, the surrounding landforms would remain dominant and would draw the eye. It is unlikely that many people would visit the part of the lake with highest visibility because access is difficult in that area due to dense evergreen vegetation that overhangs the shore. Paddling is not expected to be a common activity on this pond due to the long walk required from the parking area, and this further limits the likelihood of visitors experiencing the areas with potential visibility. In addition, the camping area is on the southern shore where there is no visibility, and the majority of fishing likely occurs closer to this main access point, again due to difficulty of shoreline access on the northern shore.

d. Kennebec River downstream of Wyman Dam

For the Kennebec River, only four to five turbine hubs would be potentially visible according to our visual simulation, with the closest turbine almost 4 miles away. Less than 9% of the River within the eight-mile project radius has potential visibility of any turbines. As illustrated in the visual simulation, the turbines would take up a very limited angle of view and would not dominate the landscape. Vegetation on the intervening ridge substantially obscures the towers of this small cluster of turbines, and the landforms remain dominant in the view. It should also be noted that the prevailing view direction for paddlers would be downstream, away from the project.

e. Arnold Trail

Given that the Arnold Trail follows the Kennebec River, our analysis of visibility is essentially the same as for the Kennebec River downstream of Wyman Dam (see summary above). However, it is worth noting that users typically follow the trail on Route 201, which parallels the river in this area, visiting scenic turnouts, interpretive

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panels and historic structures along the way (as opposed to paddling upriver), and there is no potential visibility from any of these associated resources.

Table 17. Overall Rating – Scope and Scale of Visibility

Resource	The number of turbines visible	Percent of SRSNS with visibility of turbines	Proximity of turbines	Angle of view	Visual dominance	Visual clutter	Overall Rating
Arnold Trail	Low	Low	Medium	Low	Low	Medium	Low
Bald Mountain Pond	Low	Low	Low	Low	Low	Low	Low
Kennebec River upstream of Wyman Dam (Wyman Lake)	Low	Medium	Medium	Low	Low	Medium	Low-Medium
Kennebec River downstream of Wyman Dam	Low	Low	Medium	Low	Low	Medium	Low
Punchbowl Pond	Low	Low	Medium	Low	Low	Low	Low

4.3.2 Summary Matrix of the Scenic Analysis

The matrix that results from this approach is presented in Table 18 that follows and yields an overall ranking of scenic impact on a resource-by-resource basis. This table and the individual and overall rankings inform the findings and conclusions of this Visual Impact Assessment.

Table 18. Summary of Statutory Criteria’s Effect on Scenic Impact

<p>NA = the Project is not visible from the resource or there are no turbines within 8 miles that are visible, therefore the criteria is not evaluated for its effect on scenic impact Low = the criteria’s effect on scenic impact is low Med = the criteria’s effect on scenic impact is medium High = the criteria’s effect on scenic impact is high</p>								
SCENIC RESOURCE OF STATE OR NATIONAL SIGNIFICANCE	2STATUTORY EVALUATION CRITERIA							OVERALL SCENIC IMPACT
	A.	B.	C.	D.	E.1 ¹	E.2	F.	
Arnold Trail	Low	Low	Low	Low	Low-Med	Low	Low	Low
Bald Mountain Pond	Med	Med	Low-Med	Low	Med	Low	Low	Low*
Kennebec River upstream of Wyman Dam (Wyman Lake)	Low-Med	Low	Low-Med	Low	Med	Low	Low-Med	Low
Kennebec River downstream of Wyman Dam	Low-Med	Low	Low	Low	Med	Low	Low	Low
Punchbowl Pond	Med	Med	Low-Med	Low	Med	Low	Low	Low*

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¹Note that this criterion does not assess impact to scenic quality. A resource that receives low use (and subsequently a low rating for E1) but has high scenic quality, such as a remote pond, could still receive a high overall scenic impact rating based on contributions from other criteria. Likewise, a resource that has a high use (and subsequently a high rating for E1) but has low scenic quality due to shoreline development or other considerations could still receive a low overall scenic impact rating based on contributions from other criteria.

²Statutory Criteria

- A. Significance of the Scenic Resource
- B. Existing Character of the Surrounding Area
- C. Typical Viewer Expectations
- D. Purpose and Context of the Proposed Activity
- E.1 Extent, Nature and Duration of Public Use of the Scenic Resource
- E.2 The Project's Effect on Continued Use and Enjoyment of the Scenic Resource
- F. Scope and Scale of Visibility from the Scenic Resource

*When straight averaging is used to determine overall scenic impact, these resources would receive a rating of Low-Medium. However, given the very low and almost imperceptible visibility from these locations, and the consequent low impact to use and enjoyment, these criteria are given more weight in these particular instances, therefore resulting in an overall rating of Low.

4.3.3 Weather and the Effects of Atmospheric Conditions

It is worth noting that weather and lighting conditions can have a dramatic effect on the visibility of turbines. This region of Maine has a median daily cloud cover of 32% (mostly clear) to 66% (partly cloudy), with the cloudiest part of the year beginning in October, and November being the cloudiest month.³⁹ White turbines in front of a white sky can be very difficult to discern even without the screening effects of low clouds or fog. Turbine visibility can sometimes be more pronounced on cloudy days, however, when thick clouds cast turbines in shadow with a light sky backdrop. Due to shifting cloud movements, lighting levels and quality can change significantly from one moment to the next.

The effects of weather and atmospheric conditions become more pronounced with distance. The photos of the Stetson Wind Project from Baskahegan Lake (shown below) illustrate how the shifting light conditions on a mildly cloudy day can dramatically affect turbine visibility from a relatively far distance. It is typically when turbines are heavily shadowed, which is dependent on the relative positions of the sun, turbines and viewer, that their three-dimensional forms become more distinct. Backlighting of turbines can cast them in heavy shadow. Backlighting is minimized for turbines viewed generally from the south and looking north. For locations in which the viewer is on the north side, turbines would appear cast in shadow for much longer times of the day as the sun makes its arc across the southern sky. Even on sunny blue-sky days, white turbines do not necessarily stand out in a striking way against a blue background when viewed from a distance.

³⁹ <http://weatherspark.com/averages/31953/Waterville-Maine-United-States> "This report describes the typical weather at the Waterville Robert LaFleur Airport (Waterville, Maine, United States) weather station over the course of an average year. It is based on the historical records from 1992 to 2012. Earlier records are either unavailable or unreliable."

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Photo 30. View of Stetson Wind Project from Baskahegan Lake: with direct morning sunlight on the project ridge, the white turbines are readily visible against the darker sky background.



Photo 31. View of Stetson Wind Project from Baskahegan Lake: with diffused sunlight on the project ridge, the turbines are very difficult to discern against a light sky background.

4.4 Nighttime Lighting

One critical element of visual impact resulting from utility scale wind projects is night lighting. Night lighting of this project will potentially affect users of all the resources analyzed as part of the VIA. While nighttime impacts are greatly diminished by the fact that recreation is limited during the night time hours, those users who are camping, fishing at dusk, out for a moonlit paddle, or camp/home owners with visual access to the Project will be affected.

Despite the fact that the nighttime lights do not produce glare and do not directly impact the viewing of the night sky, there is an annoyance factor associated with the continuous on-off operation of the beacons, as required for aircraft safety. The night sky is a cherished resource and the impact cannot be overlooked. The applicant has committed to installing a radar-assisted lighting system to mitigate any impacts once the FAA has approved it for wind applications in the United States, and this Project. Until such time, red-flashing lights per FAA standards will need to be used on turbines and permanent met towers. As such, an analysis of these temporary conditions has been conducted as part of the VIA.

For any of these resources from which turbine lights may be seen, the number of lights visible will vary depending on the position of the observer on the surface of the water (see also Exhibit 10: Meteorological Tower Viewshed Map, Exhibit 11: Turbine Night Lighting Viewshed Map, and Exhibit 12: Annotated Visual Simulations).

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- Arnold Trail/Kennebec River. Based on the viewshed analysis, five turbine lights would be potentially visible from an inconsequential area (.001%.) Our visual simulation confirms that up to four turbine lights could be visible from that location. Overall the viewshed analysis indicates that 8.1% of the resource has potential visibility of up to a maximum of five turbine lights. In addition, the viewshed map indicates that one MET tower light is potentially visible from negligible portions of the Kennebec River, at nearly 8 miles away. Fishing is considered the primary activity on the Kennebec River, and so those fishing at dawn or dusk from the small areas with potential turbine visibility could be affected. Rafting is not popular on this section of the Kennebec, and it is unlikely that many rafters/paddlers would be impacted by night lighting given the likely orientation of boats downstream (in addition to the fact that this is typically a daytime activity). There are no campgrounds on the Kennebec River within eight miles of the project.
- Bald Mountain Pond. Based on the viewshed analysis, only one turbine light would be potentially visible from 3.8% of the pond, and our visual simulation confirms this. Overall the viewshed analysis indicates that 3.8% of the resource has potential visibility of the turbine light. In addition, the viewshed map indicates that one MET tower light is potentially visible from negligible portions of Bald Mountain Pond, at nearly 8 miles away. Fishing is the primary activity on Bald Mountain Pond and so is the user group most likely to be impacted. In terms of camping, the campsite on southwest side of Bald Mt Pond and the AT shelter on the north side both have no potential visibility. Any users of the pond could potentially see turbine lights at around dawn or dusk, and there is the opportunity for visibility of the turbine light(s) during the rare occasion of a moonlight paddle.
- Punchbowl Pond. Based on the viewshed analysis⁴⁰, up to four turbine lights would be potentially visible from a small area of the northern end of the pond (less than 2.3%.) Overall the viewshed analysis indicates that 19.4% of the resource has potential visibility of the lights. However, our visual simulation and 3D model suggests that these lights would likely be potentially visible only through narrow gaps in the tall shoreline vegetation (65' tall trees field-verified). Fishing is the primary activity on Punchbowl Pond and so is the user group most likely to be impacted, yet difficult access along the northern shore as a result of dense evergreen vegetation overhanging the water's edge, would limit the likelihood of users being in the area of highest potential visibility. In terms of camping, there is evidence of a campsite on the southwest side of the pond that will have no potential visibility. Given that one would have to walk approximately .5 miles to get to the pond, it is unlikely that anyone would bring a kayak or canoe to this location, and dawn/dusk/night paddles are even less likely.
- Kennebec River (Wyman Lake). Based on the viewshed analysis, up to six turbine lights would be potentially visible from 11.1% of the pond. Our visual simulation confirms that up to four turbine lights could be visible from that location. Overall the viewshed analysis indicates that 54.7% of the resource has potential visibility of up to a maximum of six turbine lights. In addition, the viewshed map indicates that one MET tower light is potentially visible

⁴⁰ This analysis is based on a modified viewshed analysis that accounts for shoreline vegetation (assumed height 40' for model).

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from Wyman Lake, at over 6 miles away. Fishing is the primary activity on Wyman Lake and so is the user group most likely to be impacted. There are no campgrounds on Wyman Lake. Any users of the pond could potentially see turbine lights at around dawn or dusk, and there is the opportunity for visibility of the turbine light(s) during the rare occasion of a moonlight paddle. It should be noted, however, that lights are part of the manmade landscape here- both in terms of the lighting at the dam and associated facilities, as well as from headlights from cars travelling along Route 201 and Carry Pond Road.

The visual impact from the required night lighting of the Project is not unreasonable for several reasons:

1. The number of potentially visible turbine lights from any resource is limited, with a maximum of six lights potentially visible. As such, the scale of the potential impact is restricted to a relatively narrow portion of the horizon.
2. There is visibility of lit turbines only from a relatively small percentage of the total area of these resources- 12% or less for Wyman Lake, Bald Mountain Pond, and the Kennebec River, while Punchbowl Pond has less than 20% visibility.
3. The visibility will be reduced due to the limited vertical beam spread. Warning lights must be visible horizontally from the light and higher and do not direct light of any significant intensity below minus 10 degrees of the horizontal plane created by the direct cast of the light itself. Because of the limited vertical beam spread, visibility is reduced since viewers typically do not see these lights directly, and they do not create glare or untoward light impacts to the naked eye situated below the tower base
4. There is no impact to night sky viewing and the quality of the night sky (except on the horizon lines beyond or in the vicinity of the lights, but stargazing or the night experience is not typically focused on the horizon).
5. FAA studies have suggested that the use of red light emitting diode or rapid discharge style fixtures limits exposure time, thus creating less of a nuisance (as compared to a constant red light).
6. The visibility of these lights will be mitigated by the distance of the lights from potential viewing locations on the SRSNS's, an average of over six miles.
7. Exposure to users is limited. Very few people raft, paddle or fish at night, primarily for reasons of safety, orientation, navigation and overall enjoyment. Fisherman and others may see the lights at dawn and at dusk when they are arriving or departing from the lakes, but this would only be for limited duration and users are typically focused on preparing and launching their boats and gathering their equipment.
8. There are no publicly owned or maintained campgrounds or campsites within the study area. According to our research, there is one privately owned cabin rental business on Route 201 in Moscow, but there are no potential views from that shoreline.

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Overall, night lighting is very difficult to simulate. While it is possible to create simulations, a static photo of one moment in time does not accurately capture the effects of the lighting and we have not found that simulations provide an accurate depiction of the experience of observing night lighting. Even video type representations can be misleading. One reason for this is that night lighting visibility and effects are more dependent upon atmospheric conditions and the viewer's position than daytime visibility. Some nights that are overcast or when there is precipitation will completely obscure the lighting. Given that more than half of the days in the region are cloudy, it is therefore likely that the visual presence and consequent impact from night lighting will be greatly diminished. Hot and humid nights also create ground fog or air that is less clear given its ability to hold moisture and particulate matter. This, too, will diminish the visibility and effect of night lighting.

Only on very clear, still nights will there be continuous streaks of reflectivity on the water. Once the water is disturbed with wind or boat traffic, reflections are disrupted. The visibility of such reflections are highly dependent on viewer location and orientation, distance from the project, intervening landscapes, screening vegetation and, as stated, weather and air quality conditions. Often the viewer's eye is more focused on the bright lights and reflections from camps on the water. In fact, this type of lighting can create glare and visual impacts that are arguably more significant and more visible than the beacons on telecommunication towers and wind turbines.

4.5 Cumulative Impact

MDEP guidance promulgated in connection with the Natural Resources Protection Act, another environmental statute administered by the MDEP, directs applicants to consider the effects of past, present and reasonably foreseeable activities when evaluating potential cumulative impacts. MDEP Guidance Doc. Num. DEPLW00630-A2004. Reasonably foreseeable future activities are activities for which there is a high likelihood they will proceed, i.e., valid permits have been granted, they are in the construction phase, or applications are currently under consideration. Id. There are no other existing reasonably foreseeable wind projects in the region that should be considered when evaluating the potential for cumulative impacts. Therefore, there will be no cumulative impacts. However, it should be noted that there was a project just outside the 8-mile vicinity that was withdrawn. The Highland project was a 48-turbine project proposed on the ridges of Stewart Mountain, Witham Mountain, Bald Mountain, Burnt Hill, and Briggs Hill in Highland Plantation and Pleasant Ridge Plantation, which are roughly 10 to 17 miles from the closest turbine of the Bingham Project.

4.6 Overall Conclusion

The lakes and rivers in this area are not unique resources that stand out as one-of-a-kind scenic environments. Their character and the experience they provide will not be substantially altered or undermined by a wind energy development visible at a distance of 3.9 to 8 miles, most often as part of the background view. The shorelines will remain intact, the waters will still be quiet, the

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fishery will not be affected, and it will still draw the avid and recreational fishing enthusiast. This is not to discount the fact that there will be some visual impacts. However, there is a growing body of evidence that for many people who recreate in Maine, the presence of wind turbines in view has no impact on their use and enjoyment of the resource and, in some instances, positively impacts their experience. Thus, the assumption that visibility of turbines negatively impacts recreational users is not always true. While some people would prefer not to look at turbines, many people are indifferent and others find them beautiful. This concept is reflected in the Wind Energy Act, which specifically states that visibility alone is not a basis for determining there is an unreasonable adverse impact; rather, the department must evaluate the extent to which visibility results in an unreasonable adverse impact on scenic character or existing uses related to scenic character. That is a much more nuanced inquiry, and for the reasons set forth in the VIA and here, we do not believe that visibility of the Project will sufficiently impact the scenic character or use and enjoyment of the resource to warrant a conclusion of unreasonable adverse impact. This is due in part to the following key considerations:

- The resources and surrounding landscapes do not have unique or highly sensitive qualities that preclude the addition of an array of wind turbines within the viewshed. For example, the landscape does not have prominent distinctions between landforms, such as open water in combination with a steeply rising mountain, or have unique focal points and distinct, memorable profiles that are characteristic of iconic landscapes that are more sensitive to changes in the viewshed. Additionally, the Project hills are not visual focal points from the area resources, if visible at all. Instead, they are part of a broader landscape that is able to “visually absorb” the project, lessening its presence and thereby its visual impact.
- While appealing and valued for its recreational qualities, the Project site and scenic resources within 8 miles exhibit a landscape and opportunities that are offered at other nearby areas. The Project hills are not identified as significant recreational, scenic or cultural landmarks in the region.
- The Project area is not an intact landscape, which aesthetic experts often cite as a measure of scenic quality. This area has long been a working landscape, as evidenced in the patchwork of logging roads and skid trails, as well as the damming of rivers and varying water levels. The perception of an untouched, unalterable environment is not present here.
- Some of the Project lakes are harder to access and overall use is low, as confirmed by intercept surveys, as well as personal observation and research. This demonstrates that they are not highly regarded destination areas and receive predominantly local use.
- Typical users are primarily fishermen, snowmobilers/ATV riders, boaters and rafters. Evidence suggests that scenic quality is not principal to the user experience for these types of activities.

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- The survey results for this Project are consistent with results at other projects and demonstrate that although there will be a perceived drop in scenic quality, Project visibility will not have an unreasonable adverse impact on either use and enjoyment or, importantly likelihood to return. Moreover, these results likely overestimate the actual impact the Project will have on these values.
- The visibility of this Project is extremely low, particularly in comparison to the number of turbines. Very few resources will be affected and most will only see the tips of a few blades from limited locations. For the location with the greatest potential for visibility (Wyman Lake), the fact that the turbines are viewed over the largest generating dam in Maine, generally occupy a relatively narrow portion of the 360-degree view and that shoreline vegetation, intervening topography and distance reduce overall visibility, the impact to this resource is minimized.
- This is an appropriate site for a wind turbine project. Not only is it located in the expedited permitting area, but it allows connectivity to existing facilities and is not sited on prominent or notable hills or ridgelines.
- The evaluation of the WEA criterion lead to the overall rating of Low for all of the scenic resources, indicating that the Project will not have an unreasonable adverse effect.

Taken together, these considerations support our conclusion that the Bingham Wind Project, in accordance with the evaluation standards of the Maine Wind Energy Act (35-A MRSA Section 3452) will not result in “an unreasonable adverse effect to the scenic character or existing uses related to the scenic character of the scenic resource of state or national significance.”

5. Associated Facilities

The Project's associated facilities include access and crane-path roads, the electrical collector line and generator lead line, the substation and dynamic reactive device, the operations and maintenance building ("O&M building"), and the permanent met towers. Although not specifically included in the definition, to be conservative we have assumed that the cleared areas around individual turbine foundations, including those cleared during construction and subsequently allowed to revegetate, are also associated facilities.⁴¹

5.1 Regulatory Purview

Visual impacts of associated facilities are reviewed under the standard that applies to the generating facilities (the Wind Energy Act visual standard), unless the primary siting authority concludes that application of the Wind Energy Act visual standard "may result in unreasonable adverse effects due to the scope, scale, location or other characteristics of the associated facilities." 35-A MRSA § 3452.2. For the reasons discussed below, the Project's associated facilities are consistent with similar facilities located throughout the rural landscape in Maine, and none of the facilities are located within 3-miles of or are highly visible from scenic resources of state or national significance. Therefore this VIA evaluates their visibility pursuant to 35-A MRSA § 3452.1. In the event the review agency determines that the associated facilities should be reviewed pursuant to standards for developments other than wind energy developments, we will supplement this VIA as necessary.

5.2 Methodology

The same methodology used for the generating facilities was used for the associated facilities, which includes visual and cartographic analyses, document and statutory research, and site inventory and photographic review. In particular, we prepared viewshed analysis maps for the electrical collector, generator lead line, substation and dynamic reactive device, O&M building, and MET towers (see Exhibits 7, 8, 9, and 10), analyzed potential visibility of access and crane-path roads and clearing using 3D Analyst, and reviewed field inventory notes.

5.3 Effect of Distance on Visibility

In our analysis of associated facilities, we have employed an eight-mile viewshed from all associated facility components in order to remain consistent with consideration of visibility of the

⁴¹ "Associated facilities" are defined in the Wind Energy Act as "elements of a wind energy development other than its generating facilities that are necessary to the proper operation and maintenance of the wind energy development, including but not limited to buildings, access roads, generator lead lines and substations. 35-A M.R.S.A. § 3451(1). "Generating facilities" are defined to include "wind turbines and towers and transmission lines, not including generator lead lines, that are immediately associated with the wind turbines." 35-A M.R.S.A. § 3451(5).

5. Associated Facilities

generating facilities. However, it should be noted that a 3-mile viewshed is usually more appropriate for associated facilities. Many VIA’s of transmission lines and associated facilities do not, for example, even employ viewshed mapping and instead focus on impacts adjacent to or near to such facilities. In our analysis of associated facilities, we have gone beyond what is typically done and extended our assessment to include impacts beyond the immediate environs.

5.4 Visibility Analysis

5.4.1 Access Roads, Turbine Pad Clearing, Crane Paths

Four existing roads and one new 24 foot road will be the primary points off of Route 16 for site access. An additional 17 miles of crane path will be built between turbines, all of which will be maintained by the Applicants. Between turbines, portions of the access roads will be approximately 38 feet in width to accommodate the crane during construction, but will be reduced to 24 feet in width post construction. Many of the proposed turbine sites and portions of the Project area have been or are being used for commercial forestry operations, and the Project area contains logging roads that will be upgraded and used, where appropriate, to minimize new construction, clearing and wetland impacts (see photos that follow). New roads are sited to work with the existing topography and therefore minimize cut and fill. In most instances, existing trees will screen views of the access roads. All of the visual simulations presented in this report account for access roads and resultant clearing, if applicable. Access roads and resultant clearing will have no perceptible visibility from any scenic resource of state or national significance.



Diagram 18. The existing patchwork of logging roads that will be used for the Project can be seen in this aerial photo

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Photo 32. Existing logging road that will be used to access the northern turbine string from Route 16



Photo 33. One of the existing logging roads that will be used to access the southern turbine string from Route 16

5. Associated Facilities

5.4.2 O&M Building

The O&M building is a single story building constructed of metal or other suitable material and will be painted a neutral color to blend with its surroundings. It will be located just south of Route 16 in an area formerly used for gravel extraction and logging. The building is a typical one-story commercial structure and is similar in size to many other buildings present in the landscape. It is not located in an area of unique scenic value and a 20-50 foot wooded buffer will be maintained along the roadway that will minimize off-site visibility (see aerial image that follows).



Diagram 19. Location of O&M building will be buffered by roadside vegetation as seen in this aerial photo

Attached as Exhibit 9 is a map depicting areas within eight miles of the O&M building. While the viewshed mapping indicates off-site visibility, this is likely exaggerated due to the land cover classification along the highway, which was not one of the 3 classes typically used. Existing roadside vegetation is expected to block all views of the building, aside from those possible in the immediate vicinity of the building as you approach the access road. Portions of the Kennebec River and Wyman Lake are located within eight miles of the building, but there will be no visibility from these locations or any other scenic resource of state or national significance located within eight miles of the O&M building.

5.4.3 Electrical Collection and Generator Lead Lines

A 34.5-kV electrical collector line will collect power from each turbine and will connect at a proposed substation located in Mayfield. The substation will “step up” the power to 115 kV, and transmit the power on the generator lead line for approximately 17 miles to Central Maine Power Company’s Guilford substation in Parkman, where it will tie into the existing Central Maine

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Power Company electric system. The electrical collector and generator lead lines are typical of distribution and transmission lines that are present throughout the rural landscape in Maine (see photographs below).



Photo 34. Existing distribution lines are visible as you head north on Route 6/15 outside of Guilford

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Photo 35. Existing transmission line that feeds into the Guilford substation

The collector system will run mainly underground along project roads, with the exception of an approximately 4-mile long above-ground segment that will parallel the north side of Route 16 and a few shorter segments that connect turbine areas. The visibility of this segment and the others is likely to be blocked by existing roadside vegetation that will be maintained for the majority of this stretch of road (see photo that follows), with the only real glimpse of the line possible where it crosses Route 16 in two locations. Exhibit 7 identifies areas within eight miles of the electrical collector line with potential visibility. While the viewshed mapping indicates off-site visibility, this is likely exaggerated due to the land cover classification along the highway. None of the resources of state or national significance located within eight miles of the electrical collector will have visibility.

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Photo 36. View looking west along Route 16. The collector line would be buffered by the deciduous trees that line the north side of the road through most of this stretch.

The generator lead line will run above-ground for 17 miles to the Guilford substation through primarily wooded areas. This line has limited visibility as well, due in part to 1) the overall height of the structures which range from 34 to 80 feet, 2) its placement in a wooded landscape, and 3) the topography of the area. Exhibit 7 identifies areas within eight miles of the generator lead line with potential views. The view of this electrical line will be similar to visibility of other transmission lines present throughout the rural Maine landscape. The photograph that follows shows that, at 3.4 miles, an existing corridor clearing of 190 feet for a transmission line ROW is hardly perceptible, and the existing structure in the ROW is barely, if it all, visible to the naked eye. This compares to the proposed corridor clearing for this project, which is typically 100 feet wide (150 feet at corners), nearly half of the corridor shown in the picture.

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Diagram 20. A transmission corridor and line as viewed from a location 3.4 miles away

There is an additional scenic resource of state or national significance within the 8-mile radius of the generator lead line, which is Sebac Lake, but there is no visibility from anywhere on this lake. The only other SRSNS with potential visibility according to the viewshed map is a portion of the Piscataquis River that runs parallel to a developed stretch of Route 6/15 between Guilford and Abbot. However, based on field investigation and review of aerial photography, visibility from here is not likely due to intervening buildings and shoreline trees, which are not accounted for in the viewshed analysis. Furthermore, any potentially visible pole would be more than at least ½ mile or more away.

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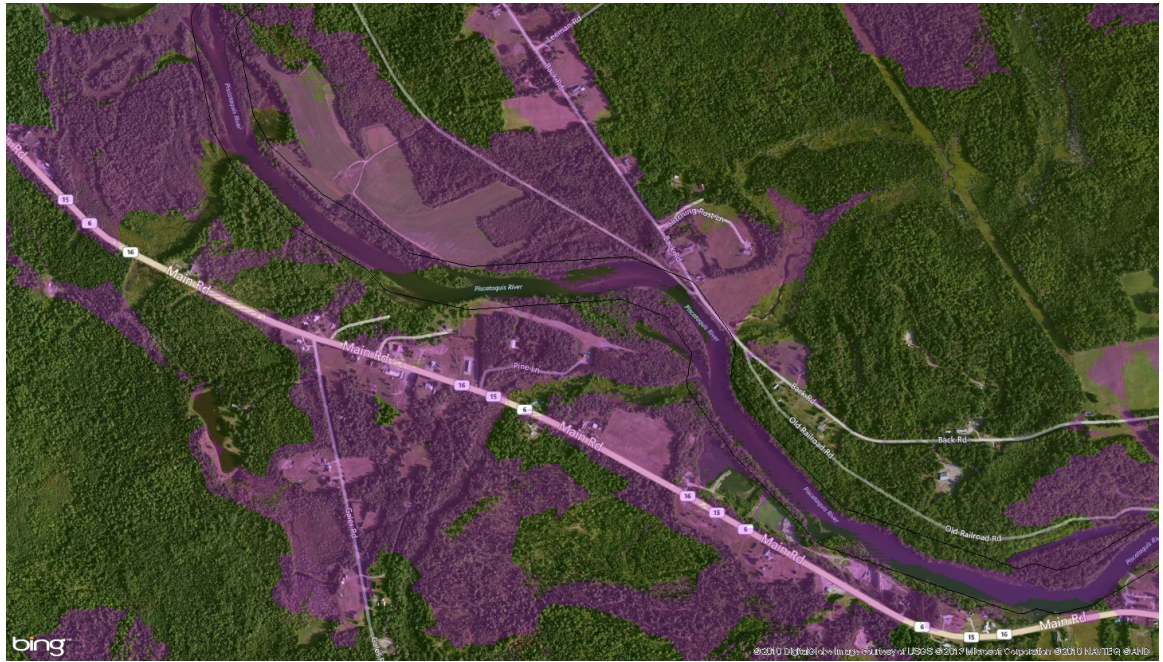


Diagram 21. This is a zoom in of the viewshed map of the portion of the Piscataquis River that has potential visibility of generator lead poles. From this image it is clear to see a vegetative buffer along the shoreline. This vegetation was not accounted for in the viewshed analysis.

5.4.4 Substation and DRD

The substation associated with the electrical collection line and dynamic reactive device (DRD) are located near the center of the northern turbine string, and due to their location, will have limited off-site visibility (see Exhibit 8). The site for the substation is already open, and the DRD will only require approximately 2 additional acres of clearing of resurgent growth trees and shrub. The substation is typical in size to many found throughout Maine, and is not located in an area identified as high scenic value. The DRD will likely be housed in a one-story building not to exceed tree height. Only Punchbowl Pond and a portion of Bald Mountain Pond are within 8 miles of the substation and DRD, but they will not have any visibility.

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Photo 37. View from the proposed substation site looking toward the access road



Photo 38. Guilford substation that the generator lead will feed into

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5.4.5 Permanent Met Towers

The Project will include up to five permanent meteorological (met) towers that will be up to 104-meters (341 feet) high and approximately 18” wide. The met towers will be scattered within the turbine array, with three located in the southern portion of the Project, and two in the northern portion. Compared to the turbines themselves, the visual impact from the met towers will be negligible and not add substantive additional impacts related to the overall visibility of the Project. This is reinforced by the fact that the towers, based on our own extensive field analyses, are typically very difficult to pick out beyond a mile or so in distance from its location - they have very narrow profiles and generally are much less visible than even cell towers. These types of towers tend to be visible only when reflecting light or visible against a contrasting backdrop of light colored sky. The photograph below shows visibility of a meteorological tower from a viewpoint three miles away. The structure is extremely difficult to discern.



Diagram 22. Met tower at 3 miles from viewing location

Although the viewshed map indicates potential visibility of one tower from Wyman Lake and negligible portions of the Kennebec River and Bald Mountain Pond (see Exhibit 10), the distance from the tower to the closest scenic resource of state or national significance is over 6 miles (Wyman Lake) and the tower will not likely be visible with the naked eye from that distance. From Bald Mountain Pond and the Kennebec River, viewing distances are close to 8 miles and beyond, so visibility is assumed to be unfeasible. No other scenic resource of state or national

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significance within 8 miles of any of the proposed permanent met towers will have visibility. The effect of night lighting of the meteorological tower is discussed in Section 4.4 of this report.

5.5 Overall Conclusion

LandWorks undertook a complete evaluation of the associated facilities of the Bingham Wind Project and evaluated the visual impacts of these facilities pursuant to the visual standard set forth in Maine's Wind Energy Act. As noted above, this region of Maine represents a working landscape that is accustomed to modern land use and landscapes, evidenced in the network of logging roads, transmission corridors, transportation infrastructure, and other general development. There is active logging in the study area with new roads being created to support this activity. Throughout most of the study area, topography, forest cover, and roadside vegetation constrain or block views of the Project's associated facilities, limiting any visual impact. There is no visibility of the substation and DRD, O&M building, electrical collection line, access roads and crane paths from resources of state or national significance, and insignificant visibility of the met tower, primarily due to viewing distances greater than six miles, and unlikely visibility of the generator lead line due to shoreline vegetation and intervening buildings and structures.